The Impact of the Charles F. Adams Class Guided Missile Destroyers on the Royal Australian Navy

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The Impact of the Charles F. Adams Class Guided Missile Destroyers on the Royal Australian Navy

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Abstract

This is a case study, based upon Australian and US archival records (some of the former newly declassified), of the acquisition of a new naval capability, examining its impact upon and legacy for the Royal Australian Navy (RAN), as well as Australia's Government and its policy. It demonstrates how three United States Navy (USN) Charles F. Adams guided missile destroyers (DDGs) were important catalysts for the Royal Australian Navy's greater self-reliance. The DDGs were acquired out of Australian interest in a closer security relationship with the US, facilitated through standardisation of RAN warships with the USN. Self-interest was mutual, and Australia was permitted to acquire, for the first time, advanced USN warships. Their purchase and affordability were aided by preferential US financing arrangements. The ships were in service from 1965 to 2001, during which time the RAN acquired six more warships of USN-origin and no more of Royal Navy (RN) origin. During this period a relatively equal professional relationship emerged between the RAN and USN, paralleling the RAN's transition away from its roots in and traditional relationship with the RN. When the DDGs left service, the RAN was more independent and confident as a professional medium power navy. Introduction of the DDGs coincided with Australia's involvement in the Cold War and with regional security concerns. Vietnam was a watershed in modern naval operations for the RAN; the DDGs served as vehicles of Government policy and built Australia's credibility with its major ally. But in Australian political circles the level of real understanding of how the DDGs contributed to Australia's security was variable. Although twice modernised with digital combat systems, they were in service too long and their replacement lacked a sense of urgency. Their operational and force structure legacy post-2016 is the US Aegis system-equipped Hobart class DDGs. For just over 25 years, the Chiefs of the RAN were officers who had commanded a DDG. They, and other similarly experienced officers, constituted the RAN's senior leadership group. Superimposition of their DDG experiences upon RN methods involved cultural change in the RAN which became more authentically Australian in character and name.

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Declarations

Originality Statement

I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the award of any other degree or diploma at UNSW or any other educational institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by others, with whom I have worked at UNSW or elsewhere, is explicitly acknowledged in the thesis. I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation and linguistic expression is acknowledged.

(David Shackleton)
11 August 2017

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Royal Australian Navy Sponsor

The Royal Australian Navy sponsor for this project was the Deputy Chief of Navy (DCN), Rear Admiral Trevor Jones, RAN, who gave his support in July 2011.[1]

Defence Security and Ethical Protocols and Approval for Publication

Approval for access to Department of Defence controlled files in the open and closed periods was given by the Chief of Navy (CN), Vice Admiral Raymond Griggs, RAN, in June 2012.[2] Dr David Stevens of the RAN Sea Power Centre was nominated by CN as his delegated RAN authority for security matters. These responsibilities were subsequently assumed by the Director of the RAN Sea Power Centre, Captain Michael McArthur, RAN.

Approval was given in August 2011 by the Department of Defence Joint Health Command to conduct research which required compliance with defence ethical research protocols.[3]

Prior to submission for examination, this thesis was reviewed by the Department of Defence for compliance with its security requirements and ethical research protocols. Those requirements and protocols have been met. In further compliance with Department of Defence requirements, approval for publication of this thesis was provided on 30 June 2017 by Commodore David Greaves, RANR, acting in his role as Chief of Staff of Navy Strategic Command.[4]

University of NSW Human Research Ethics Committee

Agreement to my research ethical protocols was given by the University of NSW Human Research Ethics Committee in January 2012 and allocated the protocol number HC12018.[5]

Certification

I certify that the above statements are true.

(David Shackleton)
11 August 2017

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1 DCN letter: DCN/OUT/2011/174 dated 7 July 2011

2 CN Letter: CN OUT/2012/476 dated 1 June 2012

3 Australian Defence Human Research Ethics Committee letter: ADHREC/OUT/2011/R9521778 dated 1 August 2011

4 These approvals are collectively contained in an email sent to David Shackleton by Ms Donna Brennan of ADHREC dated 30 June 2017.

5 UNSW HREC letter: UNSW Human Research Ethics Committee letter dated 25 January 2012

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The conduct of such research while living in the small coastal town of Narooma in southern New South Wales required considerable coordination of diaries and much use of the internet for both communication and support. I am grateful to all those who gave so freely of their time to accommodate my travel arrangements.

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This project would have been very difficult to conduct effectively without the support of the RAN. At the initiation of the project in 2011, the Chief of Navy was Vice Admiral Raymond Griggs, RAN. His personal support and that of his staff made it possible for me to gain access to official records in the National Archives of Australia closed period[6] so as to examine material up to the Top Secret level. Such access enabled identification of material for declassification to be made available for the research and its first public exposure. Vice Admiral Tim Barrett, the succeeding Chief of Navy, has similarly assisted greatly in this endeavour. While the RAN has provided support, it has not sought in any way to influence the independent academic nature of my research or its outcomes.

I wish to thank Rear Admirals Brian Adams and James Goldrick, both RAN retired, who encouraged me to pay attention to the cultural atmosphere of the RAN in this period. James Goldrick also encouraged me to make technical naval matters as accessible as possible to the reader.

Those whom I interviewed are listed separately, but I would like to record here my great thanks to them for their patience and willingness to provide me with their thoughts and the benefit of their experience and reflections. They constitute concrete proof of how much individuals are affected by decisions taken at the top of an organisation that they then have to make work by means of their sense of service, passion and ingenuity. The central role of such people in making major decisions become successful can sometimes be underestimated.

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6 See: http://www.naa.gov.au/collection/fact-sheets/fs10.aspx

Dr David Stevens and Mr John Perryman of the RAN Sea Power Centre were unstinting in their support. The Centre is a wonderful resource for those researching Australian naval matters. David and John and Commander Alastair Cooper RANR of the Chief of Navy's Office were extraordinarily helpful in arranging the expeditious declassification of Defence material used in this thesis.

Vice Admiral Peter Jones and Rear Admiral James Goldrick, both RAN retired, generously provided copies of official material they used in earlier research concerning the DDGs. That material is no longer available from official sources but is included in the material provided by the author to the Sea Power Centre as explained in Appendix J.

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Conventions Used

The following conventions have been adopted in this thesis:

A 'type' of warship is the generic name given a vessel derived from the primary purpose for which it was constructed. For example a destroyer is a type of warship, as is a frigate. A guided missile destroyer is a destroyer fitted with a guided missile system.

The USN nomenclature for referring to a guided missile destroyer was 'DDG'. The Adams class were DDGs and the terms are used interchangeably on occasion. The USN nomenclature has been adopted by the RAN and other navies.

The Royal Australian Navy (RAN) initially referred to DDGs as Surface to Air Guided Weapons (SAGW) ships.

A 'class' of ships means a number of ships of the same type constructed to the same basic design. The Charles F. Adams class of destroyers is an example. Where a large number of ships of the same class were to be constructed, they were typically built in batches, which permitted incorporation of required changes through a managed process. The Charles F. Adams class was constructed to the same basic design but the construction of batches was authorised by financial years as related to the United States defence budgetary process.

The USN frequently referred to the Charles F. Adams class as the Adams class. It was also known as the DDG-2 class. The terms are interchangeable.

Unless referred to differently in original source material, the name of a ship is written in italics and the first letter of each word is capitalised, for example: *Perth*.

The names of the RAN DDGs *Perth*, *Hobart* and *Brisbane* are normally used without adding their heritage sequence number - all three ships were the second in the RAN bearing the same name. The heritage sequence number is used where it is necessary to distinguish between the first and subsequent ships of the same name. For example, in some places the DDG *Perth* is referred to as *Perth II*. The same convention is applied to other ships' names as appropriate.

The name of the British guided missile 'Seaslug' was sometimes expressed in source material by splitting the single word into Sea Slug. The terms are used interchangeably.

The RN County class destroyers were sometimes referred to as either the Devonshire or the Hampshire class, and in this examination the names are used interchangeably. Original names are used where source material is quoted, but County class is otherwise used by the author.

'Capability' is a term denoting a specific operational potential achieved by the use of, and integration of, multiple inputs, including knowledge, personnel, processes and procedures, platforms and systems. For example, the air defence capability of a ship is made up of a synthesis of all of those elements.

'Sustainability' is a term that relates to the ability to maintain an effective military capability on operations for the period of time required.

Where the name of a person is used frequently, their given name is included on the first occasion and only their surname thereafter. Where a lengthy period elapses from first use, the given name is used again for clarity.

Some naval terms are abbreviated. For example Naval Combat Data System is abbreviated as NCDS. Unless it is a frequently used term, the full term is used on its first occurrence in each Chapter and abbreviated thereafter unless the context requires greater clarity. A full list of abbreviations is incorporated at Appendix L.

The titles, ranks, honours and awards of officers referred to in the thesis are omitted except where they add context. In some cases the rank of the person in the text is not that at which they retired, and has been used to denote the rank they held at the time concerned.

Except where shown otherwise, all officers quoted or referred to herein were members of the RAN. The service designator 'RAN' has typically been omitted in the interests of brevity.

Where numbers are used as values in the text, those of less than 10 are shown as a word unless a numeric representation is more appropriate. For example the number 5 is represented by the word five. Numbers of 10 and greater are shown numerically, for example 100.

Naval star ranks in ascending order are: Commodore, Rear Admiral, Vice Admiral and Admiral. In the military nomenclature those ranks are referred to as being those of: one, two, three or four star officers respectively. Except for Commodore, these higher ranks are also referred to as Flag rank.[7] Star ranked officers provided the highest levels of service leadership for the RAN and the Australian Defence Force.

The date of an officer's seniority in their rank could be different from the date on which they were authorised to assume the rank. This could be caused by administrative requirements having to be met before officers could be moved to their new appointment, which typically accompanied a promotion. The dates of seniority in rank determine the relative seniority positions of officers of the same rank.

A 'posting' is used to mean the appointment held by, or period of employment of, an officer in a ship or other place.

The term 'DDG Qualified' refers to an officer who commanded or was a Head of a Department in a DDG. The term 'non-DDG Qualified' is used to refer to those who never held those positions.

The term 'Australian Defence Force' (ADF) collectively includes: the Royal Australian Navy, the Australian Army and the Royal Australian Air Force. Prior to implementation of the 1973 Tange Review the collective term was 'the Services'. The terms have been used as appropriate to the

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7 Royal Australian Navy, *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54)* (Canberra: Royal Australian Navy, 1976) Page xx

period, but should be regarded as interchangeable. The singular term 'Service' is used where appropriate.

The term 'standardisation' is used to mean that multiple numbers of physical objects such as platforms, equipments and systems are the same. It can also apply to procedural techniques such as processes and methods used by the same Service or multiple Services to achieve designated outcomes, which may or may not utilise physical objects which are standard to one or the others. Standardisation of physical objects has considerable utility in achieving logistical efficiency and effectiveness across one or more Services, and standardisation of procedures and processes improves the potential for effective interoperability.

The terms 'interoperable' and 'interoperability' refer to the effectiveness of the working relationship which units of different Services can achieve to accomplish operational outcomes. The degree to which it is achievable can, in some cases, depend upon the degree of physical standardisation utilised by and between each Service. High degrees of interoperability can be achieved between Services which have high degrees of physical and procedural standardisation.

Frequently Used Terms and Abbreviations

A list of the most commonly used abbreviations is shown in this table. A comprehensive list of all terms used in the thesis is contained at Appendix L.

Term	Meaning
ABR	Australian Book of Reference
ACNB	Australian Commonwealth Naval Board
Adams Class	Charles F. Adams Class of destroyers (USN & RAN)
ADF	Australian Defence Force
Admiral	A four star rank naval officer
Anzac Class	Anzac Class of Frigates (RAN & RNZN)
ANZUS	Australia New Zealand United States Defence Treaty
ASW	Anti-Submarine Warfare
BR	Book of Reference (RN)
Captain	A naval officer of Captain rank
CDF	Chief of the Defence Force
CDSC	Combat Data Systems Centre (Canberra)
C-I-C	Combat Information Centre (USN) A compartment from where operations of the ship are controlled from
CN	Chief of Navy (RAN)
CNO	Chief of Naval Operations (USN)
CNS	Chief of Naval Staff (RAN)
Command	Commanding Officer
Commander	A naval officer of Commander rank
Commodore	A one star rank naval officer
COSC	Chiefs of Staff Committee
County Class	County Class of destroyers (RN) Also known as Hampshire Class
Daring Class	Class of destroyers constructed for service in both the RN and RAN, but RAN ships were modified for Australian conditions
DDG	Guided Missile Destroyer
DDG Qualified	An officer who held the position of Head of Department or Commanding Officer of a DDG
DDL	Light Destroyer (A project to replace the RAN Darings - approved and then cancelled and replaced by FFG Project (Perry Class))
DE	Destroyer Escort
ESM	Electronic Support Measures (normally passive detection of electronic emissions)
FAA	Fleet Air Arm
FMS	Foreign Military Sales
Hampshire Class	RN guided missile destroyer - also known as County Class

Term	Meaning
Ikara	Australian designed and built long range ASW guided missile system
JPTDS	Junior Participating Tactical Data System The RAN NCDS was developed from this system
Lieutenant	A naval officer of Lieutenant rank
Lieutenant Commander	A naval officer of Lieutenant Commander rank
Midshipman	A naval officer of Midshipman rank
NAA	National Archives of Australia
NARA	National Archives and Records Administration (United States)
NCDS	Naval Combat Data System
NTDS	Naval Tactical Data System
Perry Class	Oliver Hazard Perry Class Frigates
PWO	Principal Warfare Officer - the Seaman Officer controlling the operations room and fighting the ship on behalf of the Commanding Officer
QR	Quick Reaction - a computer controlled process for recognising and selecting the highest priority targets for engagement
QR & AI	Queens Regulations and Admiralty Instructions
RAAF	Royal Australian Air Force
RAN	Royal Australian Navy
RANC	Royal Australian Naval College
Rear Admiral	A two star rank naval officer
River Class	Class of RAN frigates constructed primarily as ASW platforms Also known as a DE
RN	Royal Navy
ROP	Report of Proceedings
SAGW	Surface to Air Guided Weapon (sometimes S.A.G.W.)
Sea Slug	Medium Range Surface to Air Guided Missile (RN)
SM-1	Standard Missile Version 1
SM-2	Standard Missile Version 2
SPC-A	Sea Power Centre - Australia
Standard Missile	The USN Standard missile family
Sub Lieutenant	A naval officer of Sub Lieutenant rank
Surface Combatant	A collective term that includes both frigate and destroyer types of warship
Tartar	Medium Range Surface to Air Guided Missile (USN)
UN	United Nations
US	United States
USA	United States of America
USAF	United States Air Force
USN	United States Navy

Term	Meaning
Vice Admiral	A three star rank naval officer
WWII	Second World War

Figure 1: (front to rear) DDGs HMAS *Perth, Hobart*, & *Brisbane* with FFG HMAS *Darwin* in the distance - 1991 (courtesy of RAN)

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Chapter 1 – Introduction

> "…It seems that the UK has dropped a long way astern in the guided missile field. I think it very likely that we shall try to switch over to the USA for ships and weapons in the future."[1]
>
> Vice Admiral Roy Dowling, RAN, Chief of Naval Staff, writing to Admiral Arleigh Burke USN, Chief of Naval Operations - 12 March 1956.

This thesis examines the impact of the Charles F. Adams class of guided missile destroyers on the Royal Australian Navy (RAN) *circa* 1956 to 2001. Acquisition of a United States Navy (USN) surface combatant[2] constituted a significant change in naval policy direction for Australia, which had hitherto purchased its warships based on British designs of the Royal Navy (RN). Overall, the study spans a period of approximately half a century of considerable change for the RAN. It is the first examination of the impact of acquiring this new class of ships for the RAN from the United States. This examination also constitutes a case study of the influence which such a major force structure decision can have on a medium sized Navy.

Introduction of the Adams class presented both risk and opportunity to the RAN. The risk was that the RN procedures, capabilities and culture deeply embedded in the RAN might have prevented a full assimilation of ships designed for the USN.[3] Opportunity existed, through a closer association with the USN, for the RAN to build upon the professional knowledge, support and confidence in its abilities it had gained from the RN as the previously most powerful Navy in the world. An increased RAN professional relationship with the USN would progressively, but inevitably, lead to its modifying some of its existing RN-based practices. The consequence being that the operational capability and culture of the RAN could be expected to change.

In the late 1950s, Australia's foreign and defence policy direction became one in which the RAN was required to act more explicitly as an instrument of the Government through

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1 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder DJ-DOX (Vice Admiral Roy Dowling RAN) Washington DC: United States Navy. Letter Dowling to Burke dated 12 March 1956.

2 'Surface combatant' is a collective term that includes both frigate and destroyer types of warship of the RAN. The Adams' were a class of destroyers.

3 The Adams class was designed for the USN by Gibbs and Cox. "History of Gibbs and Cox," Gibbs and Cox, http://www.gibbscox.com/about/history-of-gibbs-cox/

standardisation with the USN, thereby strengthening Australia's security relationship with the United States and commitment to the ANZUS treaty, established in 1951.[4] This study examines the role played by the Adams class in meeting that objective and the major consequences for the RAN. In 1951, the RAN Chief of Naval Staff (CNS) Vice Admiral Collins had remarked to his RN counterpart that the RAN might be able to acquire some aging USN destroyers to boost its capabilities, but no such action was taken.[5] In 1956 however, his successor Vice Admiral Sir Roy Dowling, made the RAN's first firm expression of such a possibility to leaders of both the RN[6] and USN,[7] and ships of the USN Adams class subsequently served in the RAN from 1965 to 2001.[8]

Case Study of the Impact of a Class of Ships

This is an original case study concerning the acquisition of a new naval capability and the impact and legacy it had on and for the RAN, and more broadly Australia's Government during the time the DDGs were in service. Introduction of a new class of warship has the potential to enhance foreign and defence policy options for a government, and similarly precipitate broader change in a navy. For the purpose of this study, the term 'impact' has been taken to imply a wide ranging examination of the introduction and operation of the Adams class whereby its influence on the RAN can be established.

This is the only study that examines the consequences of introducing a new class of warship into Australia for the first time from the United States, a country with which it previously had no such naval relationship. There is no other examination of the contribution made by the DDGs over their 36 years' service to changing the character of the RAN as an extension of the RN since its formation at the start of the 20th Century. The study highlights some

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4 Thomas-Durrell Young, "ANZUS Naval Relations, 1951-85," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 296-315

5 Alastair Cooper, "The Development of an Independent Navy for Australia: Correspondence between the First Naval Member and the First Sea Lord 1947-59," in *The Naval Miscellany*, ed. Susan Rose, Vol. VII (Farnham: Ashgate Press, 2008), 511-670, page 581

6 ibid page 631

7 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection* Letter Dowling to Burke USN dated 12 March 1956.

8 David Stevens, "Major RAN Ships 1901-2000," in *The Australian Centenary History of Defence Volume III - the Royal Australian Navy* , ed. David Stevens, Vol. III (Melbourne: Oxford University Press, 2001), 297-309

considerations that Australia, as a medium naval power,[9] had to balance in its relations with the great naval powers of Britain and the United States.

James Goldrick has noted that the RAN's transition towards truly being a 'Navy' was progressive as understanding in the RAN grew that it required greater national resources and naval expertise which went beyond those needed to be a competent operational fleet.[10] Goldrick recognises that Australia and the RAN gained implicit benefits through their access to the deep national naval character and infrastructure of Britain and the RN, thereby avoiding significant capital expenditure, and that for over four decades the RAN was able to concentrate primarily on becoming highly operationally proficient. Hence, when the DDGs were introduced, the RAN could operate them to a level of competence at least on a par with that of the USN. Unrecognised and unplanned for in their acquisition, however, were the seeds of RAN divergence from the RN, and the need for the RAN and Australia having to transition towards being more professionally independent and self-reliant in naval terms. This investigation shows that the DDGs were significant catalysts for that transition. In doing so, it also draws attention to the sometimes faltering progress made by senior naval, administrative and political leaders through their immature understanding of what was necessary in terms of Australian professional naval expertise and political will to apply national resources in order for Australia to have a Navy that met its needs.

Peter Jones explored briefly the purchase of the DDGs and some considerations in Australia making that choice, [11] and Goldrick and Jones together identified some important factors in choosing the Tartar naval surface to air missile system for the RAN.[12] Goldrick also researched the post- WWII desire of the RAN to have aircraft carriers and noted that changes in technology and costs of operation led Australia's Government to decide eventually that they

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9 A medium power is one that sits between a small power and a superpower. Medium powers tend to focus on vital interests and deterrence as a determinant for their military capabilities, but recognise that their ultimate defence comes from cooperating with strong allies. For an examination of this subject and its application to Australia and the RAN See: John R. Hill, *Medium Power Revisited* Jervis Bay ACT: RAN Sea Power Centre, 2000

10 James Goldrick, "A Fleet Not a Navy; some Thoughts on the Themes," in *Southern Trident - Strategy, History and the Rise of Australian Naval Power*, eds. David Stevens and John Reeve (Crows Nest, N.S.W.: Allen & Unwin, 2001), 291-295

11 P. D. Jones, "Buying the DDGs," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 316-329

12 P. D. Jones and James Goldrick, *Struggling for a Solution - the RAN and the Acquisition of a Surface to Air Missile Capability* Jervis Bay, A.C.T.: RAN Maritime Studies Program, 2000

were unaffordable.[13] Roy Wallace, a former US naval officer who served in Australia, examined the Defence aspect of changed Australian and American relations associated with the acquisition.[14] This study shows how the DDGs were in fact acquired by Australia to initiate that change. Wallace also suggested in 1980 that that exposure of the RAN to USN logistical methods would be beneficial,[15] and indeed this has proved to be the case.

Tom Frame has researched the geo-political relationship between Australia and the United States from the late-1770s to the early-1990s.[16] Frame notes that out of desire to build Australia's relationships with more than one great power, Prime Minister Alfred Deakin successfully encouraged President Theodore Roosevelt to include Australia as a destination on the USN's 'Great White Fleet' world cruise of 1908.[17] The visit was a great success and was received enthusiastically by Australia's Parliament and populace. But the British Admiralty was less impressed at Australia's implied sense of independent thinking about its security, and expressed the view that Empire defence required all members to contribute, thereby subsuming local defence concerns within its global strategy.[18] Australia's subsequent experiences of Britain's changing strategic priorities[19] made in its own self-interest would contribute to Australia's decision in the late-1950s[20] to express a clear intention of aligning its

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13 James Goldrick, "Carriers for the Commonwealth," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 220-244

14 Roy Wallace, "*The Australian Purchase of Three United States Guided Missile Destroyers: A Study of the Defense Aspect of Australian-American Relations*" (PhD Thesis), Tufts University, 1980

15 ibid page 222

16 T. R. Frame, *Pacific Partners: A History of Australian-American Naval Relations* Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992, page 19

17 Ibid page 18

18 ibid

19 Pre-WWII, Australia had made security assumptions on the basis of Singapore being maintained as a major bastion of regional defence, and particularly for the assured presence of the Royal Navy. As its future was being considered in the context of British strategy, in January 1941, the likelihood of Britain abandoning Singapore was described as an act of 'inexcusable betrayal' by Australia's acting Prime Minister Evatt in a cable to Prime Minister Churchill. See: D. M. Horner, *Defence Supremo: Sir Frederick Shedden and the Making of Australian Defence Policy* St. Leonards, N.S.W.: Allen & Unwin, 2000, page 134. Singapore was subsequently occupied by Japan in February 1942.

20 Statement by Prime Minister Menzies. Commonwealth of Australia. *CPD [Reps] Vol 14, 4 April 1957.* Page 573.

security planning more closely with the US.[21] Acquisition of the DDGs became a significant manifestation of the new Australian alignment.

Frame has also remarked how British it was intended for the RAN to become, and how when the RAN College commenced the training of Australian naval officers "…it was an institution designed to turn small Australian boys into Englishmen."[22] Kathryn Spurling noted that the prolonged Anglicisation of Australian officers and their adoption of RN behavioural norms impeded the evolution of relationships between RAN officers and sailors so as to reflect Australian societal customs.[23] Jason Sears' research on the officers of the RAN Executive Branch 1913-1950 demonstrated that the RAN's close linkage to the RN led to its officers becoming isolated from Australian society,[24] and suggested that the 1960s proved to be a "…turning point for the RAN when it purchased US destroyers…"[25] His work provides many insights into the social fabric of the RAN officer corps and its depth of British culture during that period, which ensured it would take a long time to transition to having Australian societal characteristics at its core. This thesis shows that the RAN's progressive formation of a more equal relationship with the USN than it had enjoyed with the RN contributed to the attitudes of RAN officers changing from earlier British held perspectives.

Jeffrey Grey canvassed the changing RAN and RN relationships post-WWII as Australia acquired the DDGs, and found that there was recognition by at least one member of the Australian

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21 Malcolm H. Murfett, *In Jeopardy : The Royal Navy and British Far Eastern Defence Policy, 1945-1951* Kuala Lumpur ; New York: Kuala Lumpur ; New York : Oxford University Press, 1995. Pages 150-154. Murfett notes that Britain's post-WWII global defence strategy was unaffordable due its dire economic circumstances, but until the early-1950s it broadly retained its pre-WWII policy of Empire defence, requiring support from the British Commonwealth. In regard to Singapore he remarks "…that the British government's attitude toward the Singapore naval base was essentially ambivalent and inversely proportional to the state of its international relations in the Far East." (page 154). Self-interest was at the core of Britain's defence strategy, and Australia had little choice but to adopt the same attitude.

22 T. R. Frame, *Pacific Partners: A History of Australian-American Naval Relations* Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992, page 19

23 Kathryn Spurling, *"Life in the Lower Deck of the Royal Australian Navy 1911-1952"* (PhD Thesis), UNSW Canberra, 1999, pages 393 - 397

24 Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, 1997, page 419

25 ibid page 421

Naval Board (Rear Admiral Graham) that the RAN had "…a long way to go to reach the truly Australian character of the Australian Army and the RAAF."[26]

Alastair Cooper researched the growing independence of the RAN from its RN heritage[27] and examined correspondence between the RN First Sea Lords and First Naval Members of the RAN.[28] Depending on the author, the Australian letters ranged in style from trivial and near obsequious, to professional and business like. The RAN took until 1985[29] to repatriate its seaman officer sub-specialist warfare training from the RN, a point of departure notable because it affected its largest cadre of officers and included those destined for its highest rank.

Eric Grove noted how the RN recognised that a shift toward independent thought was taking place in the RAN, but RN self-interest limited the degree to which it could advise the RAN independently of its own concerns.[30] George Baer[31] and Grove[32] comprehensively traced the rise of the USN and decline of the RN respectively as the most powerful Navy in the world, with both of which the RAN has had lengthy and close relations and to its clear benefit.

With the arrival of the DDGs, this study shows the RAN had the challenge of integrating advanced American warships into its force structure through an evolving hybrid USN/RAN approach to their operation and support at a time when its roots were firmly in the RN. There has, however, been no specific research undertaken into the broader impact of the DDGs in this way, despite the assertion of the Centenary history of the RAN that:

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26 Jeffrey Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972* St. Leonards, N.S.W: Allen & Unwin in association with the Australian War Memorial, 1998, page 320.

27 Alastair Cooper, "At the Crossroads: Anglo-Australian Naval Relations, 1945-1971," *The Journal of Military History,* Vol 58, 4, 1994, 699-718

28 Alastair Cooper, *The Development of an Independent Navy for Australia: Correspondence between the First Naval Member and the First Sea Lord 1947-59*, 511-670

29 G. MacKinnell, "The SWOC - Australian Trained PWOs," *Journal of the Australian Naval Institute,* 11, 1, 1985, 45-46. The transition from RN to RAN training is not addressed in detail in this research but the management and consequences of such an important change could make a useful study in its own right.

30 Eric Grove, "Advice and Assistance to a very Independent People at a most Crucial Point: The British Admiralty and the Future of the RAN 1958-60," in *Maritime Power in the 20th Century - the Australian Experience*, ed. David Stevens (St Leonards, N.S.W: Allen & Unwin, 1998), 135-155, page 154

31 George W. Baer, *One Hundred Years of Sea Power: The U.S. Navy, 1890-1990* California: Stanford University Press, 1994

32 Eric Grove, *Vanguard to Trident: British Naval Policy since World War II* London: U.S. Naval Institute, 1987

> "The purchase of the DDGs…marked a milestone in the RAN's history. It was a wholesale change that introduced new technologies throughout the navy and affected all personnel…The cost of acquiring and operating the ships was enormous, but farther and faster than any previous development, the changes wrought by the DDGs pushed the navy down the path towards becoming a uniquely Australian service."[33]

This study investigates that assertion in depth.

Culture of the RAN

There is an extensive body of research concerning organisational culture. Harvard Business School[34] and the American Psychological Association[35] are examples of learned institutions that research and publish on the meaning of culture. For the Australian Defence Force (ADF), it is the Centre for Defence Leadership and Ethics at the Australian Defence College.[36] What emerges from the literature, however, is the lack of a universal definition of culture. For this study, the author has adopted a meaning intended to encapsulate the conventional wisdom of culture being how things are done. In the RAN context, it means the accumulated practices and habits by which the RAN did business, which incorporated its organisational values, the beliefs of individuals as well as their working practices, and the social norms that collectively shaped the behaviours and character of its people. Culture can therefore change over time as any of these elements change. This study demonstrates that the DDGs contributed in important ways to changing the culture of the RAN.

DDGs as Catalysts for Changing the RAN

The primary impact of the DDGs on the RAN will be shown to have been through their unique role as catalysts for change. The ships were a 'first' for the RAN in several significant ways. Their operational centrality to the RAN exerted significant pressure on the internal and external factors that collectively influenced and shaped the Navy's environment. They were Australia's first major warships acquired by the RAN that were not of RN-origin and the first of

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33 Alastair Cooper. "1955-1972: The Era of Forward Defence." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001b. 181-209. Page 192

34 See: "Harvard Business School," Harvard Business School, http://www.hbs.edu/Pages/default.aspx

35 See: "American Psychological Association," http://www.apa.org/

36 See: "Centre for Defence Leadership and Ethics," Department of Defence, http://www.defence.gov.au/ADC/CDSS/CDLE.asp

what eventually became nine RAN surface combatants in two classes of USN-origin. Since signing the contract with the United States for the first two DDGs in 1961, Australia has not purchased another surface combatant of RN-origin,[37] and as of July 2017 there was no official intention of doing so.[38] The Adams class were the first ships purchased by the RAN whereby the tutelage of the RN was not available, and this required the RAN to make up its own mind about cost and capability trade-offs. This proved to be difficult, but it contributed to the RAN's progressively becoming more competent in understanding how it should define its requirements and how logistical support matters held greater significance than it had appreciated hitherto.

The DDGs were the first RAN ships fitted with a medium range surface to air missile system and an advanced three dimensional air search radar, and the first fitted with a bow-mounted low frequency active and passive sonar. Introduction of such advanced technologies and their ongoing support necessarily interacts with the human dimension and culture of such an organisation, and making maximum use of such opportunities can be at risk if these implications are not comprehended. This study shows that the opportunities presented were not deeply considered by the RAN when the ships were acquired. Nonetheless, those who operated, maintained and supported the ships did so with a high degree of residual professionalism possessed by the RAN via its RN traditions.

The DDGs were the first ships of the RAN equipped with modern underway replenishment capabilities: a lesson learnt by the USN from its Pacific campaigns of WWII and an important feature given Australia's vast oceanic areas of interest and responsibility. The DDGs were the

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37 Construction of the six RAN River class frigates to a design derived from the RN Type 12/Leander class commenced in Australia in 1961. David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*. Pages 305-306. At the time of this research, they were the last RN-origin surface combatants built or acquired by the RAN.

38 On 18 April 2016 the Australian Government announced its intention to commence a continuous warship building program. One of three contenders for a Future Frigate program is the British Type 26 design. A choice will be made in 2018. See: https://www.minister.defence.gov.au/minister/marise-payne/media-releases/prime-minister-and-minister-defence-continuous-naval

first ships of the RAN to be employed in combat operations where the RN was not an ally. In so doing, *Hobart*[39] became the first ship to wear the RAN's new ensign in war.[40]

The DDGs became the first ships of the RAN to be fitted with a digital combat system that introduced a new and greater level of technical complexity and operational capability for the Navy. With the decommissioning of the aircraft carrier *Melbourne* in 1982, the DDGs became the most important warships in the RAN. From 1982 to 2008, with one exception, the RAN was commanded by an officer who had commanded a DDG, replacing the carriers as the primary source of such leaders.[41] For almost 26 years, leadership of the RAN by DDG experienced officers brought opportunities for Navy-wide change flowing from their collective experiences. Judgements and decisions made by those officers integrated their USN experiences with their RN heritage, as well as with that formed through their uniquely RAN service. Their legacy was to shape the RAN toward it more clearly becoming Australia's Navy.

The DDGs were the last surface combatants of the immediate post-WWII era operated by the RAN and they were its last steam turbine powered ships to go out of service. They were also its last ships with all-male WWII-style accommodation, a situation that inhibited adoption of mixed gender crews and constrained cultural change in terms of giving women a more prominent naval role.[42] In that context, when they left service, the RAN was a significantly different Navy in terms of its culture than when they had entered.

The Cold War existed for much of the service lives of the ships and Edward Marolda notes how the DDGs were important elements of a joint USN-RAN response to communist expansionism in South East Asia.[43] Marolda also considers that "Sea power was a major factor in the successful outcome of the Cold War in Asia."[44] The DDGs were similarly an essential part of that allied effort. They, and other USN-origin ships of the RAN, later became the primary

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39 *Hobart* was the second DDG to be commissioned and first RAN ship to deploy for Vietnam operations with the US 7th Fleet. See: John Perryman and Brett Mitchell, *Australia's Navy in Vietnam - Royal Australian Navy Operations 1965-72* Silverwater, NSW, Australia: Topmill Pty Ltd, 2007. Page 13

40 "The Flag," *Royal Australian Navy News,* 3 March 1967, Vol10 No5, Page 1

41 The single officer who had not commanded a DDG, Vice Admiral Rodney Taylor, had been the commissioning Navigating Officer of *Brisbane* – the third DDG.

42 Interview with Vice Admiral Christopher Ritchie, 30 January 2013. Page 68

43 Edward J. Marolda, "Wall of Steel: Sea Power and the Cold War in Asia," in *Maritime Power in the 20th Century - the Australian Experience*, ed. David Stevens (St Leonards, N.S.W: Allen & Unwin, 1998), 167-184, pages 180-181.

44 Ibid page 183

Australian naval contribution to the first Gulf War of 1990-1991.[45] The DDGs gave enhanced defence and foreign policy options to Australia's Government of the day in terms of being able to make valuable operational contributions to its most powerful and important ally, the United States. Their place as the most capable warships in the RAN and their being fully interoperable with the USN added significantly to Australia's military capability for a prolonged period. Although the prospective date of their end of service life was accurately known, a lack of appreciation of their role and importance at senior official and political levels, coupled with insufficiently mature RAN doctrine, contributed to a failure to recognise the urgent need for their replacement.[46] After their departure from service, the capabilities of the three Adams DDGs were eventually replaced by four modernised Perry class FFGs, which in turn are to be succeeded by three new DDGs of the Hobart class, scheduled to enter service progressively from 2017.

Primary Sources and their Potential Limitations

This study spans almost half a century of RAN history. Grey has observed how the RAN has lost much of its early historical material,[47] but this study was aided by the RAN Chief of Navy sponsoring access by the author to relevant official naval and defence documentation for the period in question.[48] This study has therefore led to a significant volume of previously unavailable Australian defence and naval archival material being declassified, thereby enhancing the originality of its research.[49] These previously unreleased records considerably augment existing public documents in shedding light on this period of the RAN's history.

Australian Official Records

Hansard is a valuable source of Australian Parliamentary debates and reports but typically lacks the detail involved in policy and other decisions. RAN *Reports of Proceedings* (ROP) of the DDGs provide summary material of general interest in the relevant months of the returns

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45 Peter Jones. "1991-2001: A Period of Change and Uncertainty." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001. 239-268. Pages 261-265

46 Interview with the Hon Kim Beazley, 4 September 2014. Page 11.

47 Jeffrey Grey, Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972. Page xix.

48 Chief of Navy Letter CN/OUT/2012/476 dated 1 June 2012.

49 Navy Letter DDGCIT/OUT/2014/AB18936185 dated 5 August 2014. See Appendix J.

but do not address the details of specific issues canvassed therein. The Sea Power Centre Australia provided access to DDG ROPs not available at the Australian War Memorial.[50]

Original material utilised by Jones and Goldrick in their earlier works on selecting the DDGs[51] and the RAN's choice of surface to air missiles[52] was generously provided to the author and has been used in this study. The material is no longer available in official archives and in some cases the original file reference is missing; but there is no doubt as to its authenticity. The author has in turn provided this material to the Sea Power Centre Australia. A referencing system has been adopted by the author to identify such sources and enable their distinction from other material used in the thesis. It will also permit identification of the material by Sea Power Centre Australia.[53]

Australian archival material was obtained from the National Archives of Australia (NAA) and the Australian War Memorial (AWM). Various files and documents not hitherto examined were located in the Australian Archives and opened for public use. NAA files not previously examined, particularly those of the Australian Embassy in Washington from 1959 to 1962, were an important source of information concerning interaction between the Australian Minister for Defence and the Australian Ambassador to the United States relating to their various dealings with US officials in acquiring the DDGs.[54] Examination of the Australian Defence Programs[55] for the period 1960 to 1968 illuminated the Cabinet decision to acquire

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50 ROP available from the Australian War Memorial extended to 1976. See: https://www.awm.gov.au/about/collection/awm78/. ROP with dates beyond 1976 are available at the Sea Power Centre Australia.

51 P. D. Jones, *Buying the DDGs*

52 P. D. Jones and James Goldrick, *Struggling for a Solution - the RAN and the Acquisition of a Surface to Air Missile Capability*

53 The system works thus: SPC.DS.Num - where SPC = Sea Power Centre Australia, DS= David Shackleton provenance, and Num = the reference number assigned to the document. For example: Royal Australian Navy, *Minute CNS to Minister: Construction of DDG and ASW Capabilities. Dated 23 May 1961. (SPC.DS.1),* Canberra: Sea Power Centre Australia. Reference numbers were applied to sources as they became available and without regard to their dates of origin. Not all sources were used and hence document reference numbers and dates as listed in Appendix J are not necessarily sequential. The Sea Power Centre Australia has been nominated as the publisher for all such material.

54 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia)

55 Defence Programs were Australian Department of Defence proposals incorporating a combination of Ministerial advice, force structure proposals by each Service and budgetary estimates submitted for Cabinet approval. They were intended to provide preferred options to satisfy Government strategic policy. Not all proposals were agreed to.

the first two DDGs and then the third, as well as the RAN proposal and subsequent refusal by Cabinet to acquire a fourth ship. Access to Defence Archives at Queanbeyan, Sydney and Point Cook facilitated by the Chief of Navy enabled the sourcing of material previously not available to the public and now declassified.

Sea Power Centre Australia

The Sea Power Centre Australia is *inter alia* the RAN's primary historical research centre and its resources were used extensively. Official information concerning the RAN's introduction of naval digital combat systems was unavailable elsewhere. The 'Haul Down' reports of several Chiefs of the Navy[56] and other senior officers were invaluable sources in providing insights as to their circumstances and concerns as leaders of the RAN.[57]

The Australian Navy List

The Navy List[58] provides a record of all officers who were members of the RAN for the period of study. *The Navy List* was an invaluable primary resource of 67 Volumes used to broadly trace the careers of 296 star ranked naval officers between 1960 and 2000, enabling the creation of a database of those who served in DDGs, or otherwise. The database provides a means of evaluating the influence of serving in a DDG on star rank promotions within the primary Branches of the Navy.

Prior to June 1984, *The Navy List* contained more comprehensive information concerning officers' careers than those subsequently. Identifying every star ranked officer was possible, however, because they were clearly shown as such in each volume of the complete series. Those who were Commanding Officer of a DDG or Head of a Department for the Supply, Marine and Weapons Electrical Engineering Branches could be determined with accuracy, but this was not always possible for those who were Executive Officers of DDGs and other ships. All such verifiably DDG Qualified seaman officers who reached star rank have therefore been

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[56] The title of Chief of Naval Staff (CNS) was changed to Chief of Navy (CN) in 1997 as an outcome of a defence review. See: David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy.* Page 312.

[57] Haul Down reports are a traditional Navy method of providing an official written summation of circumstances by a senior officer relinquishing an important command or similar level of responsibility.

[58] *The Navy List* was originally published by the RN to list its naval officers, their seniorities and associated professional characteristics. The RAN publishes its own version. Sea Power Centre Australia, *The Navy List: 1960 to 2000* Canberra: Department of Defence (Navy), 1960 to 2000

incorporated in the overall examination in Chapter 6 of those seaman officers who were so promoted, which accordingly permits valid comparisons with those who were not so qualified.

Australian Navy News

The Royal Australian Navy newspaper *Navy News* commenced publication on 18 July 1958 and the typically twice monthly editions between then and 10 December 2001[59] (1008 editions) were important primary sources.[60] *Navy News* was used to supplement official channels in promulgating information and awareness of matters of general interest to all members of the RAN, their families and retirees. The paper was a news reporting medium only and proffered no editorial opinion. CNS Vice Admiral Michael Hudson noted that he used it as a means of delivering official messages to members of the Navy and their families in a plain English style.[61] On its 25th anniversary of publication in 1983, CNS Vice Admiral David Leach remarked that:

> "Navy News as it has developed in style and presentation over a quarter of a century has become something of an institution within the Navy…in the years to come chroniclers of the RAN will find past editions of Navy News a veritable gold mine of information on our activities, our achievements and, of course, some of our frustrations."[62]

Admiral Leach's assessment holds true for this study.

Records in the United States

The research included an extended visit to the United States during 2014. Records were examined at the United States National Archives and Records Administration (NARA) in Maryland, and at the USN History and Heritage Command (USNHHC) at the Washington Navy Yard, Washington DC. Discussions with historians at USNHHC were helpful in integrating USN and RAN historical experiences. Assistance was also provided by the US Naval Heritage Foundation in Washington in locating the personal correspondence of Admiral Arleigh Burke, a key USN player in the acquisition by the RAN of the DDGs. Opportunity was taken to interview the former Australian Minister for Defence, His Excellency the Honourable Kim Beazley, who at

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59 "Royal Australian Navy News 1958 - 2001 Volume 1 to 44," *Royal Australian Navy News,* 1958-2001,

60 The paper continues to be published.

61 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1),* Canberra: Sea Power Centre Australia. Page 28.

62 "Bravo Zulu from CNS," *Royal Australian Navy News,* 1 July 1983, Vol26 No12, Page 5.

that time was the Australian Ambassador to the United States, on the subjects of Australian Defence policy and the importance of the DDGs in Australian Government considerations.

Oral Sources - Interviews

A controlled oral history methodology was employed in acquiring a source of primary material for the study through interviewing 23 individuals who had a wide range of experiences associated with the acquisition, operation, maintenance and support of the DDGs. Individuals were chosen because of their subject matter expertise and in numbers proportional to their Branch size in the primary specialist areas of the RAN. Interviewees provided their insights as to the circumstances of the RAN throughout the time the DDGs were in service, and were able to bear witness as to their own experiences and opinions. Interviews were each of approximately two hours duration and fully recorded and transcribed. Each interviewee validated his interview confirming it as a record of his testimony.[63]

Advice contained in the *Oxford Handbook of Oral History*[64] and *The Oral History Reader*[65] was heeded in undertaking interviews.[66] Their recommended approaches of conducting interviews in a conversational style and asking open ended questions without interruption to encourage an expansive and thoughtful response were adopted, resulting in significant opportunities to explore matters of relevance. Notwithstanding, it is acknowledged that an interviewee can be subjective, biased or mistaken in his recollections. Mitigating that risk is considered to have been achieved through the number of interviews undertaken combined with a broadly similar series of questions, but with freedom to examine matters raised in the individual discussions. Through implementation of this process it is considered that the quality of the collective responses was as accurate in terms of recollection as possible, and that they provide credible evidence for utilisation in the enquiry.

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63 Ethical procedures required by both the Department of Defence and UNSW were followed. Joint Health Command Minute ADHREC/OUT/2011/R9521778 dated 1 August 2011 - Defence Protocol 630-11, and UNSW Human Research Ethics Committee (HC12018) dated 25 January 2012 refer. Under the agreement with those interviewed, electronic copies of each audio file and transcript will be held the University of NSW Canberra for seven years after completion of the research. The agreement also stipulated that the interview will not be made available to others without the consent of the interviewee or person they nominate.

64 Donald A. Ritchie, *The Oxford Handbook of Oral History* New York ; Oxford: New York ; Oxford : Oxford University Press, 2011

65 Robert Perks and Alistair Thomson, *The Oral History Reader*, 2nd ed. New York: Routledge, 2006

66 The introduction to each text explains the evolution of oral history and its acknowledged value as a means of establishing admissible primary historical information. The texts also give general guidance as to obtaining the highest quality of oral evidence.

Details of the interview structure and questions canvassed are given in Appendix H, and details of interviewees are given in Appendix I.

Structure of the Thesis

As research proceeded, it became clear that presenting results in an essentially chronological manner would not provide sufficient opportunity to explore fully the themes that became evident. The thesis is therefore primarily structured thematically, but a detailed chronology of events is given in Appendix D.

Chapter Themes

Chapter 1 establishes the originality, significance, and viability of the study through consideration of historical context, primary sources, secondary literature, and conceptual methodologies employed. It also provides here a description of the framework of the thesis and an outline of its contents.

Chapter 2 examines the main considerations affecting the decision to acquire ships for the RAN from the USN, and the interplay between Australian political and naval decision makers in a time of fiscal restraint but deteriorating global security circumstances. Discussion of Australia's Defence policy is confined to the period up to 1965 so as to focus on the context of the acquisition decision. The RAN was used to strengthen Australia's security relationship with the US through standardising its ships with those of the USN, but minimising their cost was more important to the Australian Government than their actual capability. The RAN's leadership interpreted the political purpose more narrowly as being the means of acquiring a guided missile system. Changes in naval technology were occurring quickly and contemporary technical knowledge at the RAN's most senior levels was lacking. The Australian Naval Board's capability aspirations were unrealistic and it did not fully comprehend the political circumstances with which it was dealing. The RAN had always relied upon the RN for expert technical and other professional advice, and therefore had no experience in choosing modern ships as complex as the Adams class. This chapter demonstrates the complex, interdependent and sometimes competing challenges faced by the RAN's most senior leadership in making choices having very long term consequences for its capability, and it exposes differences between those officers and their political leaders in terms of their understanding of Australia's security concerns. The chapter also demonstrates how positively the US Government

responded to Australia's requests in meeting its needs where their mutual interests were being served.

Chapter 3 explores the role of the DDGs in the evolution of Australian strategic defence policy and RAN force structure after their introduction. The period in question extends from the 1965 arrival of the DDGs through to their departure in 2001, and then briefly extends to 2009 in order to demonstrate their enduring capability policy legacies. For the 37 years following Australia's withdrawal from Vietnam (1972 to 2009), governments of both major political parties and the Department of Defence found it necessary to conduct comprehensive reviews out of their desire to match defence policy with resource availability. The DDGs provided important foreign and defence policy options to the Government for most of their service lives, but that significance was poorly understood by important officials. This chapter also shows that there was a lack of comprehension at senior Departmental and Government levels of the roles played by the DDGs and RAN surface combatants generally, leading to inadequate strategic planning and the emergence of a naval capability gap. Their lack of understanding was compounded by the absence of a clear high level naval doctrine, not produced until the year 2000, to help explain how the complexities of the RAN as a military force manifested themselves in practice. RAN capability shortcomings in an Australian-led UN operation in East Timor in 1999-2000 rekindled political awareness of the need for naval air defence, a purpose for which the DDGs were first acquired, and in the year 2000 led to the Government's approval of the building of three modern DDGs[67] with the last ship now expected to be delivered post-2017.

Chapter 4 examines the introduction of digital combat systems into the RAN through the Naval Combat Data System (NCDS) when acquired for the DDGs, and the impact this had on the RAN. Plans were being made to modernise the DDGs within five years of their acquisition with consideration being given to elements of NCDS forming the core of a Navy-wide digital combat systems capability. The concurrently approved modernisation of the RAN's River class frigates made no provision for achieving digital interoperability with the DDGs, compounding an existing sense, with the presence of both USN and RN-origin ships, of there being two navies in the single RAN. Application of an RN operations room fighting doctrine in the DDGs through a

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67 In public documents those ships have been generally referred to as Air Warfare Destroyers. They are guided missile destroyers of the Hobart class.

USN combat system, when each had been developed by a different Navy, meant the RAN had to make compromises in implementation. In the USN, the Adams class was too small to accommodate American advances in technology and its ships were removed prematurely from service through early obsolescence. The RAN had therefore to find ways to support NCDS to a degree it had not contemplated. The provision of shore based training for DDG operational personnel was inadequate over most of their service lives with ad-hoc measures having to be adopted. Both major modernisations of the DDGs were based primarily on retaining technical supportability of the ships, rather than on meeting clearly expressed operational requirements against which they could be tested. The RAN lacked a whole-of-navy plan for the evolution of its combat systems. When the RAN's Perry class FFGs were modernised, their NCDS was replaced by an Australian designed combat data system which had no commonality with the Swedish system of its Anzac frigates. The benefits enjoyed by the RAN through harmonisation of its DDG and FFG combat systems were transient. The chapter demonstrates that the combat systems capabilities of the DDGs became obsolete several years before the ships were removed from service. But the knowledge gained through acquisition of NCDS provided long term benefits to the RAN in terms of its growth of expertise and confidence in dealing with such issues.

Chapter 5 examines the experiences of those whose role it was to operate, maintain and support the ships. They had the responsibility of making the Adams class work and enabling its ships to become effective units of the RAN. In terms recently proposed by Paul Kennedy, the DDGs were in this sense a case of 'history from the middle'.[68] The testimony of individuals gives context to archival material, as well as balancing the official record, and provides historical insights in terms of practical realities. This chapter shows how the DDGs contributed to the RAN's achieving high performance in three core proficiencies in which a Navy must excel to be successful: operations, technical and logistical support. Through that experience, the RAN learned that logistical support was an equal part of this triumvirate. Many people were highly satisfied with their DDG experience and it gave them a sense of professional pride. But there was also a sense that the opportunity offered by the DDGs to benefit the entire Navy

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[68] See: Paul M. Kennedy, *Engineers of Victory: The Problem Solvers Who Turned the Tide in the Second World War* New York, N.Y.: Random House, 2013; and Paul M. Kennedy, "History from the Middle: The Case Of the Second World War," *The Journal of Military History,* 74, January, 2010, 35-51

was not exploited as effectively as it might have been. The chapter highlights the role of the DDGs in the RAN as it shifted its external relationship from one great naval power to another, as well as the contribution made by the ships to maintaining Australia's security through retention of the confidence of Australia's most important security ally. The ships were American, and not British, and until well after the Vietnam War were crewed only by Australian officers and sailors.[69] In that sense, the ships represented a unique environment for every member of their crew. It was one which encouraged their formation of mutual respect and trust in terms of achieving professional excellence, and in that context the ships were important catalysts for further Australianisation of the RAN. The chapter provides new insights into the RAN officer corps during a period of considerable change for both the RAN and the Department of Defence.

Chapter 6 examines the influence of the DDGs on the development of the senior leadership of the RAN through its star ranked officers over an extended period. From the time of the ships' acquisition, the RAN adopted the general practice of appointing DDG Commanding Officers and Heads of Departments such that they were amongst its most senior officers serving at sea. Until the arrival of the FFGs from 1981 onwards, other RAN officers served in ships of RN-origin and were typically not given the operational responsibilities accorded DDGs. Service in DDGs was not a prerequisite for promotion, but it is shown that officers who served in them at a senior level generally had greater prospects for advancement to star rank than others. Star ranked officers were and are the leaders of the Navy, and throughout a prolonged period, during which a majority of those officers had DDG backgrounds and knowledge of USN practices, they helped change the RAN. Through their being at its most senior echelons, and through their stewardship of the RAN in moving it towards greater self-reliance, they contributed to its culture progressively becoming more distinctly Australian in nature. Conversely, the RAN had no prospect of becoming as American in behaviour as it had been British. This chapter also shows that for an extended period the DDGs replaced the aircraft carriers as the professional nursery for those officers who were eventually chosen to command the RAN as its Chief. The experiences of various officers who commissioned the

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[69] RN officers who served on exchange with the RAN in this period were most suited to serve in its RN-origin ships of the Daring class destroyers and River class frigates. This approach made best use of their earlier training on RN equipments and methods and was also of value to them on their return to the RN.

DDGs and then participated in, and contributed to, extensive change in the RAN provide new insights into the Navy's evolution over nearly four decades.

Chapter 7 draws together the themes of the preceding chapters and provides a conclusion on the overall impact of the DDGs. The ships were catalysts for significant change in the RAN and for the growth in its self-reliance during the decline of its relationship with the RN and the concurrent building of an increased relationship with the USN that was different, but more equal. With the demise of the carrier HMAS *Melbourne,* the DDGs became the RAN's capital ships. Their Commanding Officers commanded task groups and their crews set the RAN's highest professional standards. For much of their service lives they were the most capable ships of the Navy, and through them the RAN was introduced to digital combat systems. Their period of service coincided with a near continuous period of uncertainty in international relations during which they gave foreign and defence policy options to Australia's Government. Simultaneously, there were significant changes to the RAN and the Department of Defence, during which time important lessons learned by the RAN through ownership of the DDGs were lost or were incompletely understood as it adapted, and this latter circumstance had unintended technical and operational consequences. For an extended period of time, the majority of the RAN's most senior leaders had a common career ingredient through their service in DDGs, and given their responsibility for whole-of-navy matters, they progressively brought change to the RAN which made it more truly Australian in terms of its professional doctrine and practices, culture and relationship with Australian society.

Ownership of the DDGs gave the RAN new experiences, new knowledge and enhanced confidence while it continued in its primary role of contributing to Australia's security. Collectively these factors constituted both continuity and change in a process which significantly aided transition of the RAN from being an operationally competent Fleet towards being a self-reliant Navy in a post-colonial era.

Although a class of only three ships which at the most comprised 30% of the RAN's surface combatant force, the DDGs contributed to a strengthening of ties with Australia's most important ally, the United States. Simultaneously, the DDGs were important catalysts in promoting a substantial and enduring shift in the capabilities and culture of the RAN.

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Chapter 2 - The Adams Class – An Australian Choice out of Self Interest

> "…Common sense dictates that under these circumstances, we should pay considerable attention to the logistic aspect of war, and standardize so far as we can with the Americans. Though this is a wholeheartedly British nation this is not a heresy. It merely recognises the facts of war…"[1]
>
> The Prime Minister, Mr Robert Menzies, in presenting government defence policy to the House of Representatives. 4 April 1957

This Chapter examines the issues associated with Australia acquiring the Charles F. Adams class destroyers for the Royal Australian Navy from the United States. The evidence reveals the interplay of and friction between the Australian Government policy imperative of achieving RAN standardisation with the USN, and the deeply rooted RN preferences of the Navy in a time of Government fiscal restraint but deteriorating security circumstances. The Cabinet's decision to acquire DDGs was made because it advanced Australia's self-interest in terms of its relationship with its major ally. In this context the RAN was used as an instrument of foreign and defence policy without regard to how that decision affected the Navy more broadly. Although it was not explicitly clear at the time, the decision marked a turning point at which the RAN visibly began a transition away from the RN towards becoming a more professionally rounded Service and unambiguously Australia's Navy.

Discussion of Australia's defence policy is confined in this chapter to the period from the late-1940s to the mid-1960s so as to focus on the circumstances and events involved in the process of this acquisition. Chapter 3 examines the subsequent interplay of the DDGs with Australia's defence policy.

This chapter also reveals the immature RAN methods for major capital acquisition, and the general paucity of understanding at the political level about the capabilities needed by the RAN for its role in the defence of Australia and its interests.

Introduction

Following formation of the Commonwealth Naval Force in 1901 on Australia's Federation, a decision was reached by 1909 to acquire an 'Australian Fleet Unit' made up of modern RN ships as Australia's contribution to Imperial naval defence. On their arrival in Sydney on 4

[1] Commonwealth of Australia. *CPD [Reps] Vol 14, 4 April 1957.* Page 573.

October 1913, ships manned by both RAN and RN men replaced the RN Australian Squadron and became the main fighting force of the RAN. An underpinning philosophy of Australia in making such a considerable naval investment was that men of the RAN would be trained to the same level as their RN counterparts to such an extent that they were interchangeable.[2] Hence, by the late 1950s, the RAN had taken on many of the hallmarks of the RN and formed an intimacy to the extent that the Chief of Naval Staff (CNS) of the RAN periodically sought advice from his RN counterpart.[3]

Following WWII, the RN continued to develop and improve the technical capabilities of its air defence weapons, but its guided missile technologies lagged behind those of the USN. When seeking a surface to air guided missile solution, the RAN faced the dilemma of choosing an RN ship with a guided missile system known to be inferior, or taking the risk of buying a destroyer and missile system from a country with which it had no experience of such dealings. The choice had the potential therefore to impact on the relationship between the RAN and both the RN and USN, as well as on the RAN itself.

At the same time, Australia's Government was grappling with its deteriorating relations with Indonesia and the spread of communism in its region more broadly. Although operationally experienced after participation in two World Wars and Korea, the RAN was less well versed in independently managing the acquisition of advanced warships such as the Adams class for which it had previously relied upon RN advice and expertise. Always in view for the leadership of the RAN were the implications of acquiring an American ship which would be so counter to its ingrained instinct to remain firmly British, through which it had gained so much. Making a success of acquiring the DDGs would require the RAN to both learn from the USN and become more competent in being a naval Service than simply acting as an extension of the RN. As noted by Eric Grove, the period of 1958-60, when these issues were being explored, marked "… the decisive end of an era, that of unquestioned dependence upon British equipment and

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2 David Stevens, "1901-1913: The Genesis of the Australian Navy," in *The Australian Centenary History of Defence Volume III. the Royal Australian Navy*, ed. David Stevens, Vol. III (Melbourne: Oxford University Press, 2001a), pages 5-27. Also see: Nicholas A. Lambert, *Australia's Naval Inheritance: Imperial Maritime Strategy and the Australia Station 1880-1909* Canberra: RAN Maritime Studies Program, 1998

3 Alastair Cooper, "The Development of an Independent Navy for Australia: Correspondence between the First Naval Member and the First Sea Lord 1947-59," in *The Naval Miscellany*, ed. Susan Rose, Vol. VII (Farnham: Ashgate Press, 2008), 511-670

practices, and the beginning of another, in which the political logic of ANZUS began to reflect itself in material terms of naval procurement."[4]

Australia's Long Haul Policy and Naval Air Defence

In a 1947 appreciation of strategic circumstances, Australia's Chiefs of Staff Committee (COSC) drew out implications for its defence policy and planning.[5] Stephan Frühling notes that the Chiefs were in favour of defining areas in Australia's region from which an enemy would be able to mount an attack on Australia, as well as defining those areas which Australia would need to use to deny the enemy freedom of action. The Australian area of responsibility subsequently became known as the ANZAM[6] area, linked to a joint and coordinated force for Commonwealth defence.[7]

Frühling further notes that in January 1953, the Department of Defence reviewed its strategic assessment of 1947 and developed a further chapter for government consideration with the title of: 'A Strategic Basis of Australian Defence Policy'.[8] The chapter concluded that Australia and its allies were confronting the possibilities of having to negotiate a settlement with the communist forces, of entering a prolonged period of defence preparedness as a deterrent, or of facing conflict if a settlement could not be reached.[9] In the event of global war, the risks to the Australian mainland were considered serious and, if Malaya should fall, practically the whole of Australia would eventually be within range of enemy bombers, necessitating Australia having a large air defence capability to meet the threat.[10] After due consideration, including examining the fiscal constraints on defence capability, the Minister for Defence, Sir Philip McBride, in April 1954 and later in Parliament in September, made announcements that would shape Australia's Defence policy for a considerable period of time; it became known as the 'Long Haul.' As recounted by Hector Donohue, the term 'Long Haul' had been originally

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4 Eric Grove, "Advice and Assistance to a very Independent People at a most Crucial Point: The British Admiralty and the Future of the RAN 1958-60," in *Maritime Power in the 20th Century - the Australian Experience*, ed. David Stevens (St Leonards, N.S.W: Allen & Unwin, 1998), 135-155, page 155

5 Stephan Frühling, *A History of Australian Strategic Policy since 1945* Canberra: Defence Publishing Service, 2009. Page 12.

6 ANZAM: abbreviation for Australia New Zealand and Malaya.

7 Stephan Frühling, *A History of Australian Strategic Policy since 1945* Canberra: Defence Publishing Service, 2009. Page 12

8 ibid page 171

9 ibid page 178

10 ibid page 183

used by the United States and was intended to mean adoption of a "…steady development of defensive strength at a rate which would preserve and not exhaust the economic strength of our allies and ourselves."[11] In the preamble to the 28 September 1954 Defence statement, McBride said:

> "In view of the probable nature and scale of attack laid down by the Defence Committee, it has been decided that priority should be given by the Navy to surface anti-submarine vessels, and that the responsibility for air protection at sea within the range of land-based aircraft should be assigned to the Air Force. Close operational cooperation will be maintained between the Navy and the Air Force."[12]

A myriad of practical problems were implied by that policy, not the least being how far off the coast the RAN could operate and still receive air support. There would be questions of what priority for support the RAN would command from the Air Force (RAAF) when resource priorities had to be set.[13] The focus of the RAN was to be very much on countering the submarine threat, which was to have long lasting ramifications for its force structure. The anti-submarine warfare focus also left it little scope to concentrate on other forms of warfare; most notably the air threat, which was becoming particularly sophisticated.[14] The Fleet Air Arm was also to be reformed and McBride's statement remarked that it "…will be maintained on the reduced basis of one operational carrier, one air station and five front-line naval air squadrons. Four squadrons will be re-equipped with modern Sea Venom and Gannet aircraft under present plans."[15]

In words that cannot have been well received by the RAN, McBride also said "As mentioned in my statement of the 10th April, there will be a weighting of the defence effort in favour of the Air Force. The initial step…is the assignment to the Air Force of the responsibility for air

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11 H. J. Donohue, *From Empire Defence to the Long Haul: Post-War Defence Policy and its Impact on Naval Force Structure Planning, 1945-1955* Canberra: RAN Maritime Studies Program, 1996. Page 142

12 Commonwealth of Australia. *CPD [Reps] Vol 39, 28 September 1954.* Page 1630

13 P. D. Jones and James Goldrick, *Struggling for a Solution - the RAN and the Acquisition of a Surface to Air Missile Capability* Jervis Bay, A.C.T.: RAN Maritime Studies Program, 2000, page 2

14 David Stevens, ed., *The Australian Centenary History of Defence: The Royal Australian Navy*, Vol. III Melbourne: Oxford University Press, 2001b, page 179

15 Commonwealth of Australia, *CPD [Reps] Vol 39, 28 September 1954*. Page 1631

protection at sea within the range of land-based aircraft."[16] Rear Admiral Guy Griffiths has remarked that the Navy had to accept that there would not be aircraft available for long range warning or air defence. Griffiths believes that the RAN was effectively presented with a *fait accompli* without serious analysis of the consequences having been undertaken in the decision making processes.[17] James Boutilier remarks how the operational issues of distance from land and lack of loitering time, and their impact on the effectiveness of land based air support were evidently not part of the consideration, or if they were, the problem was still one of a lack of resources.[18]

Modernising the Royal Australian Navy

Post-WWII Thinking

The RAN was considering its future well before the end of WWII. A 1943 staff paper had cited recent experience to show "…beyond all doubt that the scheme for the defence of Australia must be based, of necessity, on a strong naval arm."[19] The same document advocated a future RAN which included three light fleet aircraft carriers, a battleship and an otherwise large force of ships. Such an ambitious gaol was unachievable and eventually the 1947-1952 plans endorsed a force consisting of two aircraft carriers, two cruisers, six destroyers and three frigates.[20]

The RAN had to contend with rapidly changing technology. The great technical challenges for the aircraft carrier platform which emerged from rapid advances in aircraft performance were intertwined with increasing costs and delays in shipbuilding in Britain. CNS Vice Admiral Collins visiting the UK in 1949 was told that a steam catapult would be needed for *Melbourne*, then under construction. Problematically, the planned carrier-borne jet aircraft, known as the Scimitar, would probably be unable to operate from the ship because the steam catapult would be too short. The RN had already decided that its own light fleet carriers would be

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16 ibid page 1632

17 Interview with Rear Admiral Guy Griffiths, 13 and 19 January 2012. Page 3

18 James A. Boutilier, "Get Big Or Get Out: The Canadian and Australian Decisions to Abandon Aircraft Carriers," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 382-405, page 403

19 Alastair Cooper. "1945-1954: The Korean War Era." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001a. 155-179. Page 161

20 ibid page 162

incapable of operating the Scimitar, but had not told Collins.[21] He was dealing with factors over which he had no control, but was determined that an RAN Fleet Air Arm should be fostered.

In discussions with the RN related to the capabilities of light fleet carriers, and in what might be considered as exceeding his authority, Collins:

> "…asked that action might not be taken to bring this matter to the notice of either of the governments. He accepted the fact that the British light fleet carriers would be in exactly the same position…a hitch which he felt might be resolved eventually…the Australian government might feel disinclined to purchase the second carrier…he personally would accept, on behalf of the RAN, any disabilities in the supply of modern aircraft."[22]

Australian Government Policy with America in South East Asia

Australia's strategic relationships with both Britain and the United States continued to evolve. In April 1957, Prime Minister Menzies provided in parliament a wide ranging summary of Australia's security circumstances and highlighted changes to its security policies. In considering Australia's contribution to allied strategy, he noted that: "The emphasis is not, any longer, so much on numbers as on mobility, equipment and fire power."[23] Menzies was highlighting the change in the nature of warfighting as it had evolved post-WWII. There was no longer a viable strategy of overcoming the enemy with sheer quantity; it now depended much more on quality. Menzies went on to describe how Australia's relationship with the UK was changing and how Australia would have to think more carefully about its evolving relationship with the United States. As shown in the epigraph to this chapter, Menzies pointed out that in the event of war, Australia would be fighting with the United States in South East Asia and it would be dangerous to expect the United Kingdom to be able to provide Australia with the support it needed. [24]

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21 James Goldrick, "Carriers for the Commonwealth," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 220-244, page 236

22 ibid page 236

23 Commonwealth of Australia, *CPD [Reps] Vol 14, 4 April 1957,* page 573

24 ibid

In a landmark statement of Australia's security policy, Menzies then said "…we have decided both in aircraft, in artillery, and in small arms, to fit ourselves for close cooperation with the United States in the South-East Asian area."[25] Menzies was, in his time, apparently cognisant of the lessons of recent history where the importance of logistics had been so clearly demonstrated. Elements of the USN experience of WWII were recounted by Thomas Kane, who showed that its triumph in the Pacific campaign provided a primary example as to how critically important the role of logistics, as well as adoption of standardisation wherever practicable, had become to ensuring operational success.[26]

Although Menzies did not directly refer to naval capabilities, the implication for Australia's naval force structure was clear; Australia had to address its own national interests in its own manner. Standardisation is crucial in achieving both operational and logistical efficiencies and effectiveness, but attaining standardisation has significant implications for the military capabilities to be acquired in the first place. While Menzies qualified what was to be standardised, the practical outcome of the policy would have much wider and enduring consequences for all manner of equipment and practices. Robert Hyslop has recorded that the Naval Board understood this to mean that RAN standardisation with the RN would no longer be policy.[27] The statement of Australian alignment with the US by Menzies did not, however, come as a complete surprise to the RAN; as we have seen in Chapter 1, Dowling had written to Admirals Burke and Mountbatten in 1956 making it clear that the RAN faced difficult choices, and that acquiring guided missiles and ships from the United States was a clear option for it to take.[28]

Defence and Navy Concerns of 1959

The Defence Committee made a further Strategic Assessment in January 1959, and in a sign of concern regarding the future of Indonesia it made the case to government that Australia needed to be able to act independently against Indonesia for a period while its allies were

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25 ibid

26 Thomas M. Kane, *Military Logistics and Strategic Performance* Portland, OR: F. Cass, 2001, pages 36-76

27 Robert Hyslop, *Aye Aye, Minister: Australian Naval Administration, 1939-59* Canberra: Australian Govt. Print. Service, 1990, page 3

28 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder DJ-DOX (Vice Admiral Roy Dowling RAN) Washington DC: United States Navy. Letter Dowling to Burke dated 12 March 1956. See also: Alastair Cooper, *The Development of an Independent Navy for Australia: Correspondence between the First Naval Member and the First Sea Lord 1947-59*, 511-670), page 631

occupied in conflict elsewhere. The Committee recommended that Australian forces generally "… should be designed primarily to act independently of allies."[29] Cabinet did not agree with that recommendation,[30] implying that it could not afford such a posture and that in practice Australia's security in extremis rested upon its relationship with the United States, then underpinned by the relatively new ANZUS treaty.

Dowling had succeeded Collins as CNS, and in February 1959 prepared a Haul Down report at the end of his own tenure.[31] The unsent report portrayed a Navy that had suffered from government fiscal stringencies and Dowling noted "…the grave misgivings of his predecessor about our ability to man the Fleet have been fully realised…the Permanent Naval Forces has [sic] continued to decline to such a degree that it has barely been possible to meet peace time commitments of the Navy."[32] Dowling went on "I cannot too strongly emphasise that the R.A.N. cannot possibly fulfil the role required of it unless there is a substantial increase in the allocation of funds."[33] Why Dowling did not forward this report is not clear, but it paints a bleak picture of the ability of the Navy to meet its responsibilities and a situation that ought to have been of great concern to the Government should they have been aware of Dowling's views. Dowling subsequently became Chairman of the COSC from 1959 to 1961.[34]

The Minister for Defence, Mr Athol Townley, was not unaware of the financial problems to be overcome in equipping Australia's defence forces. In a personal letter of 19 June 1959 to Sir Howard Beale, the Australian Ambassador to the United States, Townley advised him of the difficult financial situation faced by Defence. He noted that maintenance costs were over 70% of expenditure which meant that Defence was getting into a situation where new equipment would be unaffordable, while the complexity of modern equipment was also adding to the problem. Townley recognised the impact of stringencies on the RAN when he said "…we will

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29 Defence Committee report concerning *Strategic Basis of Australian Defence Policy* quoted in Stephan Frühling, *A History of Australian Strategic Policy since 1945*, Canberra: Defence Publishing Service, 2009, page 17

30 ibid page 18

31 Royal Australian Navy, *Vice Admiral Sir Roy Dowling RAN - Brief Report on Relinquishing the Post of First Naval Member and Chief of Naval Staff. Dated 23 February 1959. (SPC.DS.36.1),* Canberra: Sea Power Centre Australia. A penscript note in the margin by an unknown author said: "This was never sent…Sir Roy apparently had some reservation about it."

32 ibid page 1

33 ibid page 7

34 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, page 311

have to shut down the Fleet Air Arm next year…"[35] Townley went on to comment that the Navy wanted submarines, inshore and coastal minesweepers and "…a couple of guided weapon fitted destroyers."[36] He then put it to the Ambassador that "It has occurred to me that the Americans may have in mothballs ships of the sort I have mentioned, and that some deal may be possible whereby we got the use of them."[37] On a different matter but indicative of how Australia's relationship with Britain was evolving, Townley relayed to Beale how annoyed he was that the British were conducting atomic trials in Australia (at Woomera) under the UK Joint Project with Australia,[38] but because of the separate USA-UK agreement Australia could not be given access.[39] In contrast, Australia's access to British missile trials at Woomera provided it with details of Britain's technically challenging development programs.[40]

Beale's response to Townley noted that "The atmosphere is not at all unsympathetic, but the difficulties are clearly formidable."[41] Beale later notified Townley that up to six former USN Gato class submarines were available for the cost of scrap, estimated to be US$100,000 each, but there were no missile-carrying destroyers or minesweepers available, and no destroyers were likely to become available.[42] He also reported that the Pentagon wanted to be of assistance to Australia but advised Townley that Australia might have to consider asking the US for assistance under the Military Aid Programme. Beale remarked that if Australia were to do that, he was "…very conscious of the fact that there would be some very sharp scrutiny of, and perhaps some unpleasant remarks about, the proportion of our national income which we (Australia) devote to defence as compared with the U.S."[43] Australia's self-imposed constraints to its defence budget had clearly not gone unnoticed by the US. Beale further

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35 Commonwealth of Australia, *US Naval Vessels for Australia*, Vol. NAA: A3092, 221/4/9/7/1 (Canberra: National Archives of Australia) Personal letter from Minister Townley to Ambassador Beale dated 19 June 1959.

36 ibid

37 ibid

38 Peter Morton, *Fire Across the Desert: Woomera and the Anglo-Australian Joint Project 1946-1980* Canberra: AGPS Press, 1989, page 224

39 Commonwealth of Australia, *US Naval Vessels for Australia* Personal letter from Minister Townley to Ambassador Beale dated 19 June 1959.

40 Peter Morton, *Fire Across the Desert: Woomera and the Anglo-Australian Joint Project 1946-1980*, page 186

41 Commonwealth of Australia, *US Naval Vessels for Australia* Personal letter from Ambassador Beale to Minister Townley dated 10 July 1959.

42 Commonwealth of Australia, *US Naval Vessels for Australia*, Vol. NAA: A3092, 221/4/9/7/1 (Canberra: National Archives of Australia) Personal letter from Ambassador Beale to Minister Townley dated 30 July 1959.

43 ibid. Personal letter from Ambassador Beale to Minister Townley dated 10 July 1959.

reported that the Pentagon had advised him that any further follow-up about naval vessels should be at a Service level. In so doing he commented that he (Beale) had learned from his Naval Attaché (Captain Marks) that "…Admiral Burrell has been in communication with Arleigh Burke, Chief of Naval Operations, on the question of whether the U.S.N. could help with equipment for the R.A.N."[44] Here we have an indication of inadequate Australian inter-departmental coordination through Beale having not been aware of the communications between Burrell and Burke. Marks had nonetheless informed Beale of the friendly attitude and desire of the USN to assist if it could, but Beale was not above constraining information either when he told Marks that the "…matter was one of defence policy and that he (Marks) was not at liberty to communicate with his seniors in Australia concerning my enquiries here."[45]

In a letter to Beale of 30 July 1959,[46] which appears to have crossed in transit with Beale's letter to Townley of 5 August, Townley reiterated how difficult it was to meet the costs of Australian defence, which he lamented, included economic aid to SEATO countries.[47] Townley remarked "…if the U.S.N. had any of the sorts of ships – for example S.A.G.W. destroyers or submarines – which they regard as obsolete, but which would be suitable for our uses, we might be able to do some sort of a deal."[48] Townley qualified that by adding "It is all academic thinking I am afraid, but I feel I must explore any and every possibility."[49] In a return note of 19 August 1959[50] Beale advised Townley that Marks had told him that "…the Navy strongly wishes to retain the Fleet Air Arm and is strongly against any purchase of submarines."[51] Beale acknowledged that Marks might have been out of touch with matters and in a further suggestion of incomplete cooperation or trust told Townley "…on the other hand there is always the possibility that the Navy, in pursuance of some little schemes of their own, are not being completely frank with you."[52] Townley acknowledged that obtaining surplus USN ships

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44 ibid. Personal letter from Ambassador Beale to Minister Townley dated 5 August 1959.
45 ibid
46 ibid. Personal letter from Personal letter from Minister Townley to Ambassador Beale dated 30 July 1959.
47 ibid
48 ibid
49 ibid
50 ibid. Personal letter from Ambassador Beale to Minister Townley dated 19 August 1959.
51 ibid
52 ibid

of any quality at heavily discounted prices was not an option for Australia and remarked "It would appear that it is quite a blue duck…"[53]

The correspondence at this point implies a combined sense of desperation and frustration on the part of the Minister for Defence in seeking to equip the Navy with anything he could get cheaply, as opposed to what the RAN might think it needed. The inference is one of Australia's Government being willing to contemplate acquiring ships for the RAN that were compatible with the USN, but at the lowest possible price and regardless of their actual operational value. Townley and Beale were corresponding on a personal level which did not include either the Minister for the Navy or the CNS, and Beale was suspicious of the RAN. The evidence suggests that Australian senior level coordination was not occurring, which may have contributed to the lack of comprehension by the Minister for Defence as to what Australia's naval service really required. Notwithstanding, to contemplate acquiring obsolete ships shows how difficult a task the Minister had in obtaining defence funding in an environment of general government ignorance concerning the impact of advancing technologies on naval warfare. This was compounded by Cabinet's unwillingness to resource the Services beyond what it regarded as the bare minimum, which was well short of that needed for Australia to take full responsibility for its own defence. The argument to strengthen the Navy was not compelling to government when it felt that in extremis it could rely upon the US. The lack of shared clarity in comprehending global affairs on the part of Ministers and their Service advisors noted by Hyslop[54] may well have contributed to Cabinet being unmoved in terms of allocating additional resources. Cost, more so than capability, was shaping much of Cabinet's considerations, placing the RAN in a very difficult position in meeting what it regarded were its responsibilities.

Senator Gorton as Minister for the Navy

Senator John Gorton became Minister for the Navy after the Australian Federal election in November 1958.[55] His personal attitude toward his portfolio was summed up some years later in his 17 October 1961 response to a Parliamentary question from Senator Dittmer concerning shipbuilding in Australian shipyards. Gorton replied that he believed his responsibility "…is to get for …the Royal Australian Navy the greatest amount of the most modern equipment in the

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53 ibid. Personal letter from Minister Townley to Ambassador Beale dated 18 August 1959.

54 Robert Hyslop, *Aye Aye, Minister: Australian Naval Administration, 1939-59*, 262, page 3.

55 "Australia's Prime Ministers (John Grey Gorton)," National Archives of Australia, http://primeministers.naa.gov.au/primeministers/gorton/before-office.aspx

shortest time and at the lowest cost, so that they will be able to do their work with the greatest of safety to themselves and with the greatest benefits to the country that they serve."[56] Hyslop notes how positively different Gorton's style was from his predecessors in the attention he paid to naval administration and the detail he sought and absorbed, and particularly in his chairmanship of the Naval Board which his predecessors had avoided because of the distance from Canberra to Melbourne where Navy Office was then located. Hyslop remarks that "…Gorton proved to be a most welcome and effective advocate…it is my view that the effectiveness of naval administration under Senator Gorton was higher than it had been under any of his predecessors."[57]

The Evolving Naval Situation in 1959

At its 6 March 1959 meeting, attended by Gorton, the First Naval Member, Vice Admiral Henry Burrell,[58] explained to the Naval Board in detail the Naval Staff proposals for a Long Term Plan for the re-equipping of the RAN. In so doing, Burrell raised a number of questions to be addressed before decisions could be taken. These included amphibious transport, whether a replacement for *Melbourne* was achievable, manpower, ship construction and not the least, the financial aspects of the plan.[59] Gorton was not happy with the state of the RAN as he had found it. As observed by Ian Hancock in his biography of Gorton:

> "On 5th April 1959 Gorton, on behalf of the Naval Board, informed Athol Townley, the Minister for Defence …that there were alarming deficiencies…the Navy lacked a missile defence against modern aircraft, it was short of modern ships, lacked a modern minesweeping capability, and had no submarines or amphibious capability. Very simply, the Navy was ill prepared to fulfil any serious role in the Asian region."[60]

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56 Commonwealth of Australia. *CPD [Senate] Vol 42, 17 October 1961.* Page 1174

57 Robert Hyslop, *Aye Aye, Minister: Australian Naval Administration, 1939-59*, 262, page 52. Frame also considered Gorton to have been very effective but criticises Dowling and Burrell for their lack of political acumen, a situation Frame considered was contributed to by former Ministers for the Navy avoiding travel from Canberra to Melbourne where Navy Office was located. T. R. Frame, *Where Fate Calls : The HMAS Voyager Tragedy* Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992b pages 3 - 6

58 Burrell was appointed as CNS on 24 February 1959. See: David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, page 311

59 Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 6 March 1959*, Vol. NAA: A2585, 1954 - 1960 (Canberra: National Archives of Australia)

60 Ian Hancock, *John Gorton: He did it His Way* Sydney: Hodder, 2002, page 87

In a Top Secret letter of 27 May 1959, Burrell advised Admiral Arleigh Burke that he was hoping to visit the United States in September of that year after visiting the UK beforehand.[61] The mission was eventually delayed until January 1960. Burrell remarked on having a big re-equipment program to deal with, but his biggest problem was whether the Government would be prepared to fund the Fleet Air Arm after 1963/64. Burrell highlighted that he wanted to discuss guided weapon destroyers and minesweepers, and that if the Fleet Air Arm were not to be replaced then his interest in guided missile destroyers would be much greater.[62]

At the Naval Board meeting of 26 June 1959, attended by Gorton, it discussed the prerequisites for an effective three-year naval program as had been requested by the Minister for Defence. At that meeting it was decided that directives should be prepared for Directors of the Naval Staff to enable them to prepare the estimates required.[63] The Board agreed on 3 July 1959 to the introduction of a submarine service, the acquisition of SAGW destroyers and the provision of a minesweeping capability. The proposed three-year naval program was then to be forwarded to the Department of Defence for consideration by the Minister for Defence.[64]

On 26 November 1959, Townley announced in Parliament the results of the Government Defence Review and major elements of a new three-year defence program. In the preamble he provided a review of factors considered and pointed out that "We have seen no reason to vary the broad strategic principles on which our defence policy has been based since the previous review of 1957." Townley went on to say "Global, or full-scale, war remains not impossible, but unlikely, as a deliberate act of policy. However, limited wars could break out in various unstable areas." He also stated that "We therefore continue to attach the highest importance in our defence policy and planning to participation in British Commonwealth defence co-operation, Seato and Anzus [sic]."[65] In regard to the RAN, Townley said that "The strategic role of the Navy is to ensure the defence of sea communications, and to co-operate

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61 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder BU (Vice Admiral Henry Burrell RAN) Washington DC: United States Navy. Letter Burrell to Burke dated 27 May 1959

62 ibid

63 Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 26 June 1959*, Vol. NAA: A2585, 1954 - 1960 (Canberra: National Archives of Australia)

64 Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 3 July 1959*, Vol. NAA: A2585, 1954 - 1960 (Canberra: National Archives of Australia)

65 Commonwealth of Australia. *CPD [Reps] Vol 48, 26 November 1959.* Page 3183

with allies and sister services in general operations of war. Our naval policy places special emphasis on anti-submarine capabilities."[66] Implying that the cooperation with other nations would fill the strategic capability reduction that he was about to announce, the Minister went on to describe the future of the Fleet Air Arm. After pointing out that *Melbourne* could not operate the type of modern aircraft needed and that the ship itself would therefore have to be replaced "A replacement carrier of a modern type, that would be suitable to our requirements and within our Budget, is not available from any likely sources….Cabinet has reached the decision that the Fleet Air Arm will not be re-equipped when the present aircraft reach the end of their service life in 1963."[67]

By then, Townley clearly understood the budgetary problems and the cost of a modern defence force, but the advice from Gorton on the state of the RAN had not made sufficient impact on Cabinet Ministers more broadly to the extent that they believed the Fleet Air Arm should be retained. Goldrick points out that the real circumstance was in fact that the Fleet Air Arm was unaffordable and notes "With the exception of the years of the Korean emergency, no Australian government was willing to devote the resources which the ACNB and Admiralty knew to be necessary to create a fully effective carrier force."[68] Withdrawal of *Melbourne* would also remove the RAN's primary capability in terms of providing the long range air defence of its ships, leaving them to rely on the medium to small calibre guns with which they were armed. In terms of other air defence assistance, Jones and Goldrick comment that "The (RAAF) fighter force simply did not possess the range to operate at any distance from the Australian mainland."[69] This problem had been understood by Gorton, himself a former RAAF officer and WWII fighter pilot, who explained to Hancock "…a Mirage jet had about a 400-mile radius, could only spend ten or fifteen minutes on top of the target, and then would be obliged to make the 400 mile return trip…If however, a ship was operating more than 400 miles from the Australian coastline, then the RAAF would not be able to provide any support at all."[70] The capability of the RAN - as previously described by Dowling and understood by Gorton - was largely operationally ineffectual. In 1959, all of its ships represented RN designs which had

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66 ibid page 3184
67 ibid
68 James Goldrick, *Carriers for the Commonwealth*, 220-244, page 239
69 P. D. Jones and James Goldrick, *Struggling for a Solution - the RAN and the Acquisition of a Surface to Air Missile Capability*, page 2
70 Ian Hancock, *John Gorton: He did it His Way*, page 88

emerged toward the mid-to late 1940s, which since that time had become increasingly outmoded in relation to modern surface and air launched anti-ship weapons such as were being acquired by Indonesia from the Soviet Union.

Emerging Indonesian Military Capabilities

In the early 1960s Indonesia was leaning politically toward the Communist bloc and the tension between Indonesia and the Netherlands over West New Guinea had resulted in armed clashes.[71] Indonesia's proximity to Australia and the strategic importance of its vast archipelago spanning the approaches to Australia could not be ignored. The Indonesian Navy was receiving modern ships, submarines, patrol boats and anti-ship capable missiles transferred from the Soviet Union. In 1962 the Indonesian Navy was reported as having received a 15,450 ton Sverdlov class cruiser which complemented its five Skory class destroyers and six Whiskey class conventional submarines. The submarines were of particular concern in that they gave Indonesia a modern offensive capability against the warships of the RAN.

Of significance to the RAN also was Indonesia's possession of 12 Komar class guided missile motor gunboats.[72] They were assessed as being capable of speeds up to about of 40 knots and each was armed with two 'Styx' guided missiles, which in 1962 had a reported engagement range of 15 miles,[73] subsequently updated to the mid-20 nautical mile range.[74] With the Styx missile capable of a speed of approximately Mach 0.9 and carrying a warhead of approximately 450 kilograms, Komars could be potentially lethal to any ship within their range and they would be a particularly difficult threat to counter amongst the myriad islands and inlets throughout the Indonesian archipelago.[75] Should the RAN have to operate north of Indonesia, as it expected it would, its ships would have to give the archipelago a wide berth in transit, or accept the risk of attack when they passed through the various straits. During the Vietnam War the USN was also concerned about Styx and described them as being "…particularly

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71 Cooper. *1955-1972: The Era of Forward Defence.* Ed. Stevens. Melbourne: Oxford University Press. , 2001b. Page 197

72 Janes Information Group, *Jane's Fighting Ships 1964-65* London: Sampson Low, Marston and Co, 1964, pages 126-129

73 ibid page 306

74 Randall Forsberg, ed., *World Weapon Database - Institute for Defense and Disarmament Studies* Lexington: Mass: Lexington Books, 1986, pages 475 - 478

75 Styx (SS-N-2) was used by the Egyptian Navy to sink the Israeli destroyer Eilat at a range of 15 miles on 25 October 1967. Randall Forsberg, ed., *World Weapon Database - Institute for Defense and Disarmament Studies* Lexington: Mass: Lexington Books, 1986, page 478

serious threats to forces such as Sea Dragon/SAR [search and rescue] due to the extremely short time of flight (thirty seconds to about four minutes) during which the ship must detect, evaluate and destroy the missile."[76]

The Soviet Ilyushin IL-28 twin jet tactical bomber, with the NATO code name of 'Beagle', had also been acquired by Indonesia. This aircraft had a reported range of 1,490 to 1,550 miles with a maximum bomb load estimated to be 2,000 kilograms.[77] The aircraft was also capable of carrying and launching two Soviet 'Kennel' anti-ship missiles.[78] Hence, with its combination of forces Indonesia presented a modern and credible threat to the operations of the RAN and RAAF particularly, and to Australia more generally. The planned loss of the fighter element of the Fleet Air Arm in 1963, coupled with the sole reliance on RAAF air support within the range of aircraft operating from land, left the RAN having no effective defence against Indonesian threats when operating at any distance offshore from Australia. Such was Australia's concern with Indonesia's intentions during a period of strained relations[79] that in September 1964 two RAAF squadrons of Sabre fighters deployed to its northern city of Darwin as fears mounted of raids from the Beagles.[80]

Melbourne received a government reprieve to remain in service as an ASW aircraft carrier, and in 1961 it was announced that it would be equipped to carry rotary wing aircraft following the purchase of 27 Wessex ASW helicopters from Britain.[81] But in practice the RAN was having an air defence capability gap imposed on it at a time when international security circumstances were deteriorating. Following trials with USN A4 Skyhawk aircraft, and having already committed to the purchase of American S2E Tracker aircraft as replacements for the Gannet ASW aircraft, the Government in October 1965 agreed to the purchase of 10 Skyhawk A4E

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76 Malcolm Muir, *Black Shoes and Blue Water: Surface Warfare in the United States Navy, 1945-1975* Washington, D.C: Naval Historical Center, Dept. of the Navy, 1996, page 175

77 Janes Information Group, *Jane's all the World's Aircraft 1962-63* London: Jane's Information Group, 1962, page 293

78 Kennel (AS-1) had an estimated range between 62 and 93 nautical miles depending on the flight profile and carried a warhead of 900kg. Randall Forsberg, *World Weapon Database - Institute for Defense and Disarmament Studies,* pages 429 - 431

79 The period of tension with Indonesia, known as 'Confrontation', did not come to a close until August 1966. See: Alastair Cooper, "1955-1972: The Era of Forward Defence," in *The Australian Centenary History of Defence Volume III. the Royal Australian Navy*, ed. David Stevens (Melbourne: Oxford University Press, 2001), 181-209, page 199

80 "Fighters Ready to Confront Threat (Operation Handover - September 1964)," *Royal Australian Airforce News,*

81 Commonwealth of Australia. *CPD [Reps] Estimates 1961-62 Speech 5 October 1961.* Page 1708

aircraft to replace the Sea Venoms. The Chairman of the COSC was not convinced of the value of the Trackers and Skyhawks and opined to the Minister in September 1964 that the cost of acquiring those aircraft was "…an excessive price to pay to see out the remaining years of *Melbourne*'s life and to retain naval aviation."[82] With CNS' agreement however, he also suggested that if the Government still wanted to pursue their acquisition then there was an option of acquiring cheaper reserve aircraft from the USN.[83] The Minister for the Navy, Mr Frederick Chaney, stated that the A4s would be delivered in late 1967 and *Melbourne* would be capable of operating them after its 1968 refit. Although it was not a withdrawal from the policy of providing land based air defence of the fleet, he noted that "The Skyhawks will provide the carrier with a proven counter against hostile reconnaissance aircraft and with a limited strike capability against surface force attack in convoy operation. Their acquisition will round out its capabilities and increase further its anti-submarine capacity."[84] In the same announcement, Chaney announced that the extended refit of *Melbourne* would be reduced to essential modernisation work over a period of about six months.[85] RAN proposals in 1964 to fit *Melbourne* after 1968 with radars and air direction capabilities as fitted to the DDGs were not approved,[86] a situation that ensured *Melbourne* was technically ill-equipped to perform its duties in the evolving context of maritime warfare, but which gave early potential recognition to the value of the DDGs in the future RAN order of battle.

Overseas Mission by Burrell

Rear Admiral Ian Crawford is of the opinion that it was Captain David Wells who convinced Gorton of the importance of what Crawford called "a maritime strategy for Australia" and that the RAN had serious operational shortcomings.[87] The consequence was that Gorton wanted an overseas mission to resolve matters, which was later led by Burrell, accompanied by Rear Admiral Ken Urquhart and Captain David Wells. Crawford was to have been the Flag Lieutenant and Secretary for the mission, but remarks that he was left off because of travel

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82 Commonwealth of Australia, *Department of Navy Three Year Program - 1965/66 to 1967/68*, Vol. NAA: A1945, 84/3/10 (Canberra: National Archives of Australia) Chairman Chiefs of Staff Committee Minute dated 13 September 1964. The Chairman of the COSC was Air Marshal (later Air Chief Marshal) Sir Fredrick Scherger, RAAF.

83 ibid

84 Commonwealth of Australia. *CPD [Reps] Vol 43, 26 October 1965.* Page 2167

85 ibid

86 Commonwealth of Australia, *Department of Navy Three Year Program - 1965/66 to 1967/68* Department of Navy Letter dated 28 October 1964.

87 Interview with Rear Admiral Ian Crawford, 30 May 2012. Page 15

funding limitations.[88] Preparation of a new Navy program by the Government was expected to follow.[89]

In January 1960, Burrell and his small team embarked on a mission to the UK, Canada and the US to find out what was likely to be available to meet the needs of the RAN, and for what price. In what can be interpreted as an indication of the extreme dissatisfaction felt by the RAN at the demise of the Fleet Air Arm, before his departure Burrell received a communication from the Secretary of the Department of Defence that "…directed me to refrain from investigating the question of a replacement aircraft carrier for HMAS *Melbourne*."[90] Burrell was operating in challenging circumstances. Australia's regional security situation was worsening, the Minister for the Navy had proclaimed the Navy to be incapable of meeting Government needs, and the major capability of the Navy, represented by the fixed wing element of its Fleet Air Arm, was to be disbanded in the near future. The circumstances also presented Burrell with a significant opportunity. He had been given the latitude and authority to examine options for submarines, minewarfare vessels, support ships and guided missile destroyers, and to make a report on their suitability and acquisition.

Burrell's Visit to Britain

Burrell arrived in London in mid-January 1960 and recalled that his initial meeting with Chief of the Defence Staff, Admiral Mountbatten, was not a happy one. Burrell commented "From what he said to me, he was under the impression that I had recommended the closing down of the Fleet Air Arm. When he had finished his harangue, he left immediately for some important engagement, discourteously not offering me the opportunity of reply to rectify his misconceptions."[91]

The RN was not unaware of the pressing issues confronting the RAN or that it was starting to see itself as a more independent Navy with its own views. As Grove notes, the RN made preparations for Burrell's visit and, perhaps as an indication of the changing nature of the relationship, the preparatory RN brief noted that "The Australians are very independent people. They will welcome Admiralty advice and assistance but will not tolerate ready-made ideas being thrust upon them...We must at all costs avoid giving the impression that we regard

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88 ibid
89 Commonwealth of Australia. *CPD [Reps] Vol 48, 27 November 1959.* Page 3296
90 Henry Burrell et al., *Mermaids do Exist* South Melbourne: Macmillan, 1986, page 252
91 ibid

the RAN merely as a prop or adjunct of the RN in the Far East."[92] The RN position was also that "…it ought not be too difficult to pour a little cold water on the extremely expensive and highly specialised G.M. ships[93] and to play up, by comparison, the value of the new frigates: which, incidentally, would have the attraction for Admiral Burrell of being more easily sold to Australian Ministers as giving more ships for less money."[94] The proposition of having more but less capable ships ignored the capability shortfall the RAN found itself in, but was probably based on a better understanding of the cost of ships than the RAN had. Similarly, such an approach did not allow that the RAN at some point might operate independently of the RN, which was to occur seven years hence when the RAN was committed to operations in Vietnam with the USN.

Although a ship would be needed as the platform, the primary consideration for the RAN was the performance of the RN missile system then undergoing development: Seaslug. Seaslug had evolved from Project Brakemine, established by the UK in 1943 in response to the increasing difficulty of providing effective air defence for its ships against more sophisticated threats.[95] The RN staff requirement in 1945 was for Seaslug to be able to engage six targets per minute. By 1948 that requirement had changed to engaging five targets in sequence, and subsequently further evolved into a desire to fire three rounds per target to give a kill probability of 80% before the target came within 10,000 yards of the firing ship.[96] Technical challenges slowed progress but the first successful trial firings of the beam-riding Seaslug took place in 1956, with tests concluding in 1961.[97] Australia and the UK had begun an extensive collaboration program in 1946 for the development of guided weapons that continued until 1980,[98] the arrangement being that Australia was a full partner in the program and had

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92 Eric Grove, *Advice and Assistance to a very Independent People at a most Crucial Point: The British Admiralty and the Future of the RAN 1958-60*, 135-155, page 135

93 HMS *Devonshire* was the first of the County Class; it was launched in June 1960 and completed in November 1962. Janes Information Group, *Jane's Fighting Ships 1964-65*, page 271

94 Eric Grove, *Advice and Assistance to a very Independent People at a most Crucial Point: The British Admiralty and the Future of the RAN 1958-60*, page 145

95 Peter Morton, *Fire Across the Desert: Woomera and the Anglo-Australian Joint Project 1946-1980*, page 186

96 Norman Friedman, A. D. Baker and Alan Raven, *British Destroyers & Frigates: The Second World War and After* London: Chatham Publishing, 2006, page 179

97 ibid page 180

98 Peter Morton, *Fire Across the Desert: Woomera and the Anglo-Australian Joint Project 1946-1980*, page 575

complete access to all test results.[99] Perhaps in recognition of the technical and operational limitations of Seaslug, the RN had commenced development of Sea Dart in 1963, with trials at Woomera beginning in 1965. Sea Dart was an advanced semi-active homing missile and later replaced Seaslug.[100] Rear Admiral Griffiths feels that Burrell was pro-RN and that the Naval Staff in Canberra had serious concerns about the capability of Seaslug, which they considered aptly named. He remarks that the Naval Staff kept their fingers crossed because they were worried that Burrell would prefer the Hampshire class.[101]

Burrell's Visit to America

Burrell went from London to New York to hold meetings with Burke, arriving in New York on Sunday 31 January 1960 for a nine-day official visit to the US Navy.[102] Burke had been promoted to the position of CNO direct from two to four stars, selected over 92 officers his senior, and held the post for three successive terms from August 1955 to August 1961.[103] Burrell described Burke as "…a tough destroyer captain during the Second World War…"[104] Given Burrell's own experience as a destroyer captain and as the first Australian Naval Attaché to the United States in 1940,[105] the ingredients were present for a productive professional relationship to emerge. Such relationships between the heads of friendly navies are generally nurtured for mutual self-interest and underpinned by trust and cooperation. Hence, it would have been unlikely that Burke did not take some action to see what it might be possible to offer his Australian counterpart. During his US tour Burrell visited the Farragut class guided missile destroyer USS *Dewey*, and was probably given a tour of its main armament, the Terrier missile system, but he made no remark of that aspect in his memoir.[106] The capabilities of USS *Dewey* later featured in a brief provided by the Naval Staff to the COSC, through the Joint

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99 ibid page 547
100 ibid page 353
101 Interview with Rear Admiral Guy Griffiths. Page 44
102 Henry Burrell et al., *Mermaids do Exist*, page 256
103 George W. Baer, *One Hundred Years of Sea Power: The U.S. Navy, 1890-1990* California: Stanford University Press, 1994, page 346
104 Henry Burrell et al., *Mermaids do Exist*, page 256
105 T. R. Frame, *Pacific Partners: A History of Australian-American Naval Relations* Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992a, page 37
106 Henry Burrell et al., *Mermaids do Exist*, page 256

Planning Committee, which compared how compliant various ships were against the SAGW Naval Staff Requirement.[107]

Just over a decade later in 1972, Lieutenant David Cotsell was the aide to RAN CNS Vice Admiral Peek. Cotsell recalls that Peek "…had a regular personal correspondence with Arleigh Burke. They were obviously not only professional colleagues but good friends."[108] Such a rapport builds trust and belief in the dependability of commitments made on such a personal level. Burke had a long standing affection for the RAN as indicated by a note he sent to Dowling in November 1956 thanking him for undertaking a visit to the US in which he remarked that "…there are bonds between us that only shipmates can understand."[109] As an indication of the warmth of welcome for Burrell, Burke ordered him "…given a salute of seventeen guns, rather than the fifteen to which I was entitled…"[110] Without prompting, Burke also offered Burrell an unmodified Essex class aircraft carrier to replace *Melbourne*.[111] The commonality of experience and friendliness of Burke's personal relationships with Dowling, Burrell and later Peek, placed the RAN in a position where it had reached a place of import within the leadership thinking of the most powerful Navy in the world. Such a status potentially helped build RAN confidence at its own most senior levels in the USN and its equipment, and made its shift away from standardisation with the RN a less daunting prospect. Any questions in Burrell's mind about the performance of Tartar or the Adams class generally would likely have been satisfied through his personal relationship and confidence in Burke's ability to overcome any problems and to help the RAN.

Choosing Tartar as the RAN Surface to Air Missile System

USS *Adams* underwent first of class trials from 16 to 18 August 1960, overseen by a group from the USN Board of Inspection and Survey (INSERV), comprising one Rear Admiral, six

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107 Commonwealth of Australia, *Navy Program Proposals 1960*, Vol. NAA: A1945, 84/3/4 Part 1 (Canberra: National Archives of Australia) Minutes of Joint Planning committee of 11 August 1960, Appendix A to Report by the Chiefs of Staff Committee – Navy Program Proposals 1960. This brief did not include either the USN Brooke or Bronstein Class ASW frigates that later became part of the five options explored by Burrell in modifying the Adams Class to meet RAN requirements. See Appendix C.

108 Interview with Captain David Cotsell, 8 January 2013. Page 26

109 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection* Letter Burke to Dowling dated 8 November 1956

110 Henry Burrell et al., *Mermaids do Exist*, page 256

111 ibid

Captains, four Commanders and two Lieutenant Commanders.[112] The Tartar missile system was assessed as being "…a generally good system. However, due to developmental problems and changes, the system is not operational in its current state."[113] The same report noted planned improvements to the fire control computers and the smoothness of target tracking.[114] Those trials took place after Burrell's visit, during which he had been briefed by the USN as to how variation in the design of Tartar would allow it to be fitted to existing ships in a modification program.[115] Burrell knew from the difficulties Seaslug was having in trials at Woomera "…that I had no hope of obtaining approval to acquire 'County' class ships with the weapon fitted, nor would I have made such a recommendation."[116] After the US visit Burrell wrote to Burke remarking that his programme had covered what he wanted "…and will help me greatly in reshaping the R.A.N. of the future."[117]

Events in the Pacific campaign of WWII had raised USN awareness of how lethal the air threat to ships had become. The sinking by Japanese aircraft of the RN battleship HMS *Prince Of Wales* and battlecruiser HMS *Repulse* on 10 December 1941 off Singapore "…was the first case in the history of naval warfare when capital ships under way were sunk exclusively by aircraft."[118] The nature of the new air war at sea was becoming clearer.[119] Such was their experience with Japanese saturation air attacks in WWII[120] that the USN came to believe that its future air defence capabilities had to become automated. Those requirements were incorporated in the development of the Naval Tactical Data System (NTDS)[121] and its

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112 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 280 Folder DDG2 Vol1 (1 of 2) Chief, Bureau of Ships USS CHARLES F. ADAMS (DDG-2) Preliminary Acceptance Trials and Material Inspection Ser 523A-3658 dated 13 October 1960. Page 2

113 ibid page XI-2

114 ibid

115 Commonwealth of Australia, *Navy Program Proposals July 1960*, Vol. NAA: A1945, 84/3/4 ATTACHMENT B (Canberra: National Archives of Australia) Section 4, paragraph 14

116 Henry Burrell et al., *Mermaids do Exist*, pages 254-255

117 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection* Letter Burrell to Burke dated 23 February 1960

118 George W. Baer, *One Hundred Years of Sea Power: The U.S. Navy, 1890-1990*, page 136

119 German interest in remotely controlled aircraft acting as bombs had emerged prior to WWII. The first contract for development of an unmanned German bomber was awarded in 1940. See: Rowland F. Pocock, *German Guided Missiles of the Second World War* Shepperton: Mddx., Allan, 1967, page 29

120 George W. Baer, *One Hundred Years of Sea Power: The U.S. Navy, 1890-1990*, page 209

121 David L. Boslaugh, *When Computers Went to Sea* Los Alamitos, California: IEEE Computer Society, 1999, page 119

Bumblebee program of missile development.[122] NTDS, its relationship with RAN DDGs and consequent impact on the RAN, are addressed in Chapter 4.

Semi-active homing of guided missiles was a superior technical solution to beam riding guidance against low flying targets, and its development and application became part of the USN Terrier Improvement Program. Concurrently, improved rocket motors were being developed which permitted boost and cruise using the same motor, as well as tail control of the missile rather than wing control. Further work resulted in a missile being developed which included "…as many improved Terrier features as possible, and it proved successful beyond expectation. The Navy approved the program, which became Tartar, early in 1955, and almost immediately work began on a missile version of the then standard destroyer, the Forrest Sherman."[123] The Bumblebee program became the foundation for the USN family of Standard Missiles which continued in service with the USN and other navies, down to the present day in the RAN from its introduction through the DDGs.[124] Tartar was designed to replace a single 5-inch-54-calibre (5"/54) gun mount on a one-for-one basis in a destroyer, which made it a compact system for fitting in a warship.[125]

Studies in 1958 had shown that Tartar was vulnerable to saturation attack by tactics likely to be adopted by the Soviet Union, and research commenced on an improved system, which ultimately became the Aegis advanced combat system.[126] Development of Tartar (and Terrier) did not progress smoothly, caused in part by the immaturity and unreliability of their technology.[127] The first Tartar prototype flew in 1958, but it had serious problems. Initial shipboard trials started late and had to finish early because of recurring problems in the maintenance of the fire control system,[128] and in 1962 "…a sample of six Tartar ships reported 30 percent readiness."[129]

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122 Norman Friedman, *U.S. Destroyers: An Illustrated Design History*, Revised ed. Annapolis, Md.: Naval Institute Press, 2004, page 220

123 ibid page 222

124 Raytheon Company (USA), *STANDARD MISSILES Public Release Portfolio Revision F (2012) (SPC.DS.27),* DSER # 214754 Washington DC: Raytheon Company.

125 Norman Friedman, *U.S. Destroyers: An Illustrated Design History*, page 222

126 ibid page 223

127 ibid

128 Norman Friedman, *The Naval Institute Guide to World Naval Weapons Systems* Annapolis, MD: Naval Institute Press, 1990, page 154

129 ibid page 156

Friedman notes that at that time the USN had invested approximately US$6.5 billion in missile ship construction and conversion, and the consequences of failure were extensive. In September 1962, some 11 months after Australia had signed a contract in October 1961 for purchase of the Adams DDGs,[130] Burke directed that a hold be placed on further missile development while technical issues of reliability were resolved, including those of Tartar. The 'holiday', as it was referred to, extended into 1965. There was also direction that "The use of multi-purpose digital computers and digital data transmission shall be exploited, and the integration into the weapon systems of high performance 3-D radars, such as the SPS-48, shall be considered part of that program."[131] The USN would be working hard to overcome significant shortcomings with Tartar after the RAN had decided on its acquisition, and in effect the RAN had purchased a missile system that would be the main armament of its future ship without knowing what its operational performance and reliability actually were.

Burrell had returned to Australia in March 1960[132] and on 18 March 1960 the visiting RN First Sea Lord, Sir Charles Lambe,[133] was briefed by the Australian Naval Board in Canberra on the outcome of Burrell's mission. Minutes of the meeting record that "…(the RAN) program had been influenced by the type of guided weapon available and the need to standardise on one particular weapon. The weapon selected was Tartar."[134] In promulgating the Defence Review on 29 March 1960, Defence Minister Townley announced that since November 1959 the Government had been considering its options for a number of new naval projects that included the possibility of introducing an Australian submarine force, guided missile destroyers and minesweepers. Townley referred to Burrell's mission and noted that when the Government had finished considering Burrell's report, it would then be in a position to announce decisions associated with the Navy.[135] The willingness of Burrell to reveal to his RN counterpart an as

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130 Commonwealth of Australia, *Australian Consulate General New York Purchase Order for 2 DDG 2 Class Destroyers. Dated 26 October, 1961 (SPC.DS.9),* Navy File 1215-201-76 Canberra: Sea Power Centre Australia.

131 Norman Friedman, *The Naval Institute Guide to World Naval Weapons Systems*, page 156

132 Minutes of Naval Board meetings provide only a cursory review of his overseas mission. Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 18 March 1960*, Vol. NAA: A2585, 1954 - 1960 (Canberra: National Archives of Australia)

133 "Naval Conference," *Royal Australian Navy News,* 8 April 1960, Vol 3 No 7, Page 1. Lambe was also visiting the RN Submarine Squadron.

134 Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 18 March 1960*

135 Commonwealth of Australia. *CPD [Reps] Vol 13, 29 March 1960.* Page 649

yet unapproved government commitment is demonstrative of the intimacy shared by the two navies and the degree to which they felt able to exchange confidences.

As well as seeking to acquire a new surface to air guided missile equipped destroyer from Britain, Burrell ideally wanted a surface to air missile system that would also be suitable for fitting to Australia's Daring class destroyers. The RAN had been initially encouraged by remarks made by the RN Director of Naval Construction who suggested that Tartar should be fitted to the County class derivative as preferred by the RAN, and not Seaslug.[136] In a reflection of their increasing obsolescence and unacceptable costs of modernising the Darings, Tartar was not fitted, and nor did the intention announced in November 1964[137] to fit them with Australia's Ikara ASW system come to fruition. Jones notes that Burrell's trip had convinced him of "…the superiority of the Tartar missile over Seaslug, and the 5-inch/54 gun system over the 4.5-inch gun." [138] Nonetheless, and as an indication of his real preference, Burrell recounted that he had asked the RN to investigate the fitting of Tartar to the County class because he thought the Tartar installation was a much neater fit.[139]

At the Naval Board meeting on 3 June 1960, attended by Gorton, a range of options were considered for advising the Government on future requirements for a 'New Naval Program'. Modifying the Darings with Ikara and fitting the RN Type 184 sonar was canvassed, but this would not meet the full SAGW requirement or enable a ship to carry a helicopter. The cost of fitting a single channel Tartar to a Daring was estimated at A£3.987m. The Board recognised that "…SAGW was essential for air defence and helicopters for A/S purposes. Therefore both were requirements for escorts for the RAN."[140] The cost of building a Daring hull would be A£17m if constructed in Australia and A£15m if constructed overseas, but because "… it would not have the required command features and would not have the required endurance, it did not satisfy the staff requirement."[141]

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136 Norman Friedman, A. D. Baker and Alan Raven, *British Destroyers & Frigates: The Second World War and After*, page 194

137 Commonwealth of Australia. *CPD [Reps] Vol 46, 10 November 1964.* Page 2720

138 P. D. Jones, "Buying the DDGs," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), page 320

139 Henry Burrell et al., *Mermaids do Exist*, page 254

140 Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 3 June 1960*, Vol. NAA: A2585, 1954 - 1960 (Canberra: National Archives of Australia)

141 ibid

The Board minutes showed that an RN option was still in the mix and members still thought that a modified Hampshire class from the RN of about 6,000 tons with three helicopters, Sea Cat and Tartar, modern ASW equipment and endurance of about 5,000 miles would cost in the order of A£20m, including the cost of the helicopters.[142] Gorton accepted the recommendations as military priorities but wanted it recorded that "…he would accept the Naval Staff requirement for a modified Hampshire class only on the understanding that all smaller vessels had been examined and discarded."[143] Gorton might have known by then that the Adams was smaller than the Hampshire class,[144] but it is not clear from the record why a smaller ship was preferred, and it is possible that Gorton associated size with cost.

At the time of the Defence Estimates session of Parliament on 11 October 1960, the results of Burrell's mission earlier that year had still not been made public. The Minister for Defence announced "The Government will be considering shortly proposed new projects for the Royal Australian Navy, following inquiries made overseas earlier this year by a naval mission… I expect to announce the Government's decisions in the very near future."[145] Burrell's preference for standardising the RAN missile system on the basis of USN Tartar and fitted in an RN County class hull would not survive subsequent political direction.

The RAN's Preferred Option – a Modified County Class

The number of iterations undertaken by the RN in designing the County class and accommodating multiple complex variables took considerable effort. Friedman has traced the difficulty faced by the RN in making operational and technical compromises to eventually arrive at a solution that was operationally capable while being affordable.[146] Although design of the ship had commenced several years before, and was intended to be smaller than it ultimately became, the problems with development of Seaslug meant that the ship design was not finalised until March 1956.[147] The RN also intended to operate the County class as an air defence ship in a carrier task group, but with facilities to embark a Flag Officer and staff. This

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142 ibid

143 ibid

144 The Hampshire/County Class displaced 6,200 tons full load, and the Charles F. Adams Class displaced 4,500 tons full load. See: Raymond Blackman, ed., *Jane's Fighting Ships 1968 - 69* London: Jane's Fighting Ships Publishing Ltd, 1968. Pages 299 and 373.

145 Commonwealth of Australia. *CPD [Reps] Vol 41, 11 October 1960.* Page 1855

146 Norman Friedman, A. D. Baker and Alan Raven, *British Destroyers & Frigates: The Second World War and After*, page 184

147 ibid

had a direct impact on the ship design which added volume needed for accommodation and working compartments. The RAN had not stipulated the requirement to embark a staff in the manner intended by the RN and instead used its two aircraft carriers as Flagships. With the conversion of *Sydney* to a troop transport, by the mid-1960s[148] this left the RAN with only *Melbourne* with its outmoded command and control capabilities, and whose maintenance requirements prevented it being continuously available.[149]

On 4 July 1960 the RAN Naval Board sought RN advice concerning the design of a ship with the full range of equipment and systems it had discussed at its early June meeting.[150] They included variable depth sonar Type 199, digital computer data handling ADAWS, and the TIDE data link.[151] These requests were substantial, but nonetheless they suggest the possibility that the RAN had started to develop awareness of the first generation RN digital combat system and data link then in development, but not that of the USN's NTDS. The RAN's proposal involved removal of the ship's gas turbines and therefore a substantial change to the propulsion system, installation of a significant (and non-British) surface to air missile system, conventional RN guns and two (large) Wessex (S-58) helicopters[152] - all in a ship that the RAN thought would displace between 3,500 to 4,000 tons and which appeared to be a general derivative of the Daring hull and propulsion system.[153] The RN First Sea Lord had expressed surprise at the RAN belief that "…so much could be done with such a small ship."[154] The RN argued that the RAN requirement was not feasible, and that a ship of at least 4,000 tons would be needed.[155] Burrell may not have known that when Mountbatten was First Sea Lord in 1955, he had observed unhappily "…that in every category of ship it (the RN) needed more personnel

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148 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, page 204

149 ibid page 194. Afloat command and control capabilities for the RAN were rudimentary compared to those being introduced by the USN as was to be experienced later in Vietnam operations and Exercise RIMPAC (see Appendix K).

150 Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 3 June 1960*

151 Norman Friedman, A. D. Baker and Alan Raven, *British Destroyers & Frigates: The Second World War and After*, page 195

152 Seeking advice concerning two helicopters vice three stipulated in its original staff requirement implies the difficulty of achieving that outcome had become acknowledged by the Naval Board.

153 Rear Admiral Ken Urquhart, an engineer, had been present with Burrell in the UK when the RAN had expressed the desire for a Daring-sized ship incorporating all the RAN operational requirements.

154 Eric Grove, *Advice and Assistance to a very Independent People at a most Crucial Point: The British Admiralty and the Future of the RAN 1958-60*, page 150

155 Norman Friedman, A. D. Baker and Alan Raven, *British Destroyers & Frigates: The Second World War and After*, page 194

per ship than the US Navy."[156] The RN was also aware of how the USN Tartar program was proceeding, and in October 1956 had done an analysis "…in which Tartar would replace X gun mount in a Daring class destroyer."[157] This was potentially the configuration that Burrell had desired and he was possibly encouraged by the earlier remark attributed to the RN Director of Naval Construction regarding the swapping of Seaslug with Tartar, but the modifications were not of interest to the RN. RAN understanding of modern warship design appears to have been limited, being a consequence of its reliance upon RN designs and incomprehension of those challenges the RN was confronting with its own emerging advanced weapon systems.

RAN engineering officers, indeed officers of all its naval specialisations, had received education and training with the RN, and it could be expected that RAN senior officers would be generally cognisant of naval technical developments. Hence the apparent lack of comprehension at the most senior technical and non-technical levels of the RAN of the significant technical risk of changing the design of the County class is somewhat surprising. The Staff Requirement of the RAN meant that it was effectively seeking a new and novel design, of which none existed in either the RN or USN. Significantly modifying the County class to the extent being sought by the RAN would involve considerable re-design of its hull and superstructure to ensure its fitness for purpose and safety of operation.

It can be inferred that the explanation for pursuing the modified County class option was a strongly held desire on the part of the RAN's leadership to remain as close to the RN as possible, and that the act of purchasing a ship other than from Britain was not a step easily taken. The issues associated with even a minor separation of the RAN from the RN would probably have been of concern to Burrell, but the implications of such a major departure as acquiring an American warship would almost certainly have caused him anxiety. Burrell remarked in his memoir that when he was informed of the lack of British drawing office effort to consider his request for a re-design of the County class, he had not been anxious to look elsewhere for a solution. "The entire life of the RAN had been built around RN classes of ship, their armaments and stores items – everything except the Royal Marines and rum."[158] At that time, senior officers of the RAN seem to have been unfamiliar with the newer technologies being exploited by both the USN and RN, which increased its reliance upon their good will; a

156 ibid page 181
157 ibid page 194
158 Henry Burrell et al., *Mermaids do Exist*, page 254

situation it would eventually have to overcome and require it to develop its own expertise on its path toward greater self-reliance.

Rear Admiral Maxwell Reed, like Griffiths, has a sense that Burrell had a natural inclination toward an RN acquisition, meaning the County class destroyer, and comments "…but it wasn't until David Wells told me to appear at CNS's house after dinner one night with the drawings, and I laid them out and old Henry said "…'Oh goodness, that's the HAMPSHIRE eh?' It was a staggering response."[159] Reed's reaction was caused by his sense that this was the first time Burrell had seen a drawing of the County class ship. In turn this infers that the fundamental but complex issues of capability, cost and schedule were being discussed by those who would have to make a recommendation to government without them having a real sense of what technical risk actually existed.

Senator Gorton's Preference - the Adams Class

The Adams class design was known by the USN Ship Characteristics Board (SCB) as SCB 155, and based on that of the Forrest Sherman class - the last of the all-gun destroyers of the US Navy. Friedman noted that the Adams were 13 feet longer, and 18 inches of beam was added to preserve stability given the increased 600 tons of full load displacement.[160] The biggest change over the Sherman class was replacement of the after gun by the Tartar missile system.[161] Burrell's mission in 1960 would not have ascertained the view, subsequently held by the USN SCB that the Adams class was:

> "Graceful and balanced, they do not seem to suffer from the bloating effect of modern weapons like other American destroyers… [But] the DDGs are not consistent internally with other fleet destroyers. [They have] austere supporting systems and suffocating internal compressions – cramped crew quarters, jammed machinery spaces and minimal support areas… [They are] short legged…uncomfortable to serve in and a severe problem to maintain…"[162]

USN ships of the Adams class were intended as escorts to carriers, able to contribute to the overall air defence of the force, and complementing the capabilities of other Talos-Terrier-

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159 Interview with Rear Admiral Maxwell Reed, 8 February 2012. Page 10
160 Norman Friedman, *U.S. Destroyers: An Illustrated Design History*, page 308
161 ibid page 222
162 ibid page 308

equipped ships.[163] Their mission was to screen naval forces and shipping and to operate offensively.[164] In contrast, the importance of the County class to the RN was higher and it had Flag staff accommodation, whereas the Adams class had only limited space for a USN Unit Commander and staff.[165] By virtue of it not carrying a helicopter or variable depth sonar (VDS), the Adams class as built for the USN did not fully satisfy the RAN SAGW staff requirement. Presumably to test the feasibility and also obtain information from the USN to compare against any RN advice, the RAN developed five alternative configurations of the DDG (Alpha through to Echo) for assessment by the USN.[166] As will be shown, this request confused the USN as to what the RAN really wanted.

Gorton became concerned about the quality of the RAN's Cabinet submission for the 1960 Program. In mid-July 1960, the Secretary of the Navy Department provided Gorton with a summary of Navy Program proposals from March 1959 to June 1960 which showed inconsistencies in presenting information as refinement of the Navy Program had evolved.[167] For instance, in July 1959 the RAN had been directed to plan for the acquisition of a single SAGW destroyer, but was now proposing two ships.[168] A week later Gorton advised Townley that the RAN wanted a ship similar to the Hampshire class, but because the Naval Staff Requirement in practice called for a different ship, it meant that in reality the desired ships did not physically exist at that time. The design would therefore take time to be developed,

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163 The USN introduced three different surface to air missile systems so as to provide layered defence from long range (Talos) to medium range (Terrier), to short range (Tartar) air defence. Technical advances permitted formation of the Standard Missile family which replaced all three missile systems. See: Raytheon Company (USA), *STANDARD MISSILES Public Release Portfolio Revision F (2012) (SPC.DS.27),* DSER # 214754 Washington DC: Raytheon Company.

164 United States Navy, *Records of the Bureau of Ships* Box 41 Folder C-DDG/4720 1/1/60. Ship Characteristics Board Memorandum: No 97-60 Ser 0239P42 dated 7 June 1960. Enclosure 1 (OPNAVINST 0910.98C)

165 The USN organised ships into squadrons led by a Unit Commander who embarked in nominated ships as required. In 1960 the Staff intended to be embarked in an Adams ship consisted of 6 officers and 12 enlisted personnel who were separate to the crew. Limitations in ship volume eventually reduced the space for Unit Commander to minimal.

166 The options ranged from minor to substantial and are shown in Appendix C.

167 Commonwealth of Australia, *Navy Program Proposals 1960* Secretary to Minister for Navy Minute Navy Programme Proposals dated 18 July 1960

168 Dowling was Chairman of the COSC that considered the 1960 Navy Programme and recommended separately to Townley that unless financial circumstances improved for the RAN, it was likely that only one Hampshire Class variant could be afforded and the other deferred. See: Commonwealth of Australia, *Navy Program Proposals 1960*, Vol. NAA: A1945, 84/3/4 Part 1 (Canberra: National Archives of Australia) Minute Dowling to Townley, undated in file but can be dated as 20 August 1960, being two days after the meeting.

Gorton's estimation being that a modified Hampshire would be unlikely to be acquired in the following three years.[169] Gorton obtained advice at the end of August to assure himself that the Naval Board had not explicitly ruled out the Adams class, and in so doing Mr Samuel Landau as the First Assistant Secretary (B)[170] also provided Gorton with the Naval Staff comparison table of ships that showed the Adams was estimated to be the cheapest of the serious contenders.[171] Burrell was therefore not keeping his Minister fully apprised of his intentions, which by then Burrell should have realised would not sit easily with Gorton. In the difficult political and budgetary environment, Gorton was in control, not Burrell.

The COSC met on 18 August 1960 where *inter alia* it discussed Burrell's proposal for two SAGW ships.[172] Concern was expressed that their envisaged cost would make the overall Defence program unaffordable. The Hampshires would represent 20% of the total defence budget which worried both the Chiefs of the Army and RAAF. The proposal to replace Seaslug with Tartar was discussed and Burrell anticipated that the change of Hampshire design could be accommodated by the RN at an early stage. Burrell advised COSC that the RAN's modified ships were quoted as costing A£20 million each, with that figure being A£0.6m more than the RN price; but he gave no basis as to the quality of the estimate. Burrell's opinion was that the Hampshire modified to RAN requirements was the "… cheapest and most effective all purpose escort capable of meeting the Australian requirements."[173] The cost estimate used by Burrell has to be regarded as implausible. Given the earlier lack of firm RN advice as to technical achievability, Burrell's confidence in the RN's ability to extensively modify the Hampshire design for an estimated price increase of only about 3%[174] was extremely optimistic. Burrell's situation was however one in which the RAN had little if any expertise to assess the costs of such technical challenges. He appears either to have accepted uncritically the advice of those

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169 Commonwealth of Australia, *Navy Program Proposals 1960*, Vol. NAA: A1945, 84/3/4 Part 1 (Canberra: National Archives of Australia) Letter Gorton to Townley dated 25 July 1960

170 ibid. Minute Secretary Department of Navy to Minister Gorton dated 31 August 1960

171 ibid. Minutes of Joint Planning committee of 11 August 1960, Appendix A to Report by the Chiefs of Staff Committee – Navy Program Proposals 1960

172 Commonwealth of Australia, *Navy Program of July 1960*, Vol. NAA: A8447,67/1960 (Canberra: National Archives of Australia) Minutes of Joint Planning committee of 11 August 1960, Appendix A to Report by the Chiefs of Staff Committee – Navy Program Proposals 1960

173 Commonwealth of Australia, *Navy Program of July 1960*, Vol. NAA: A8447,67/1960 (Canberra: National Archives of Australia). Page 6

174 Based on the estimated RN cost of £19.4m (obtained by subtracting £0.6m from £20.0m)

who guided him prior to the meeting, or to have simply relied on his instinctive confidence in the abilities of the RN such that all would be well.

Coincidentally, the COSC meeting was held on the same date as USN trials were being conducted of USS *Adams*, resulting in its missile system being deemed unready for operational service.[175] Griffiths believes there was reluctance at the top of the RAN to acquire an American ship, not the least because he believes those officers who had served predominantly with the RN in WWII had not been close enough to the USN to appreciate what it had achieved.[176]

The evidence indicates that to have acquired a modified County class for the RAN would have proven to be a profound mistake. Neither the RN nor USN had a requirement for what the RAN desired, hence all of the risks would have rested with the RAN. The technical challenge of fitting a USN missile system into an RN destroyer which had been purpose designed and built to carry an RN missile system was extreme, and would have markedly and adversely affected the cost and schedule of the endeavour. Unbeknown to Burrell was the added complication of the USN having to make many changes to its Tartar system before it was operationally ready. The confidence of the Naval Board in being able to achieve a successful outcome therefore again suggests strongly that the senior officers of the RAN lacked the current technical knowledge necessary to comprehend such matters. Several decades later, a comparable optimism linked to a high risk technical endeavour would again be a source of considerable difficulty for the RAN as evidenced by the Australian Auditor General's report on modernising the RAN Perry class FFGs.[177]

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175 United States Navy, *Records of the Bureau of Ships* Box 280 Folder DDG2 Vol1 (1 of 2) Chief, Bureau of Ships USS CHARLES F. ADAMS (DDG-2) Preliminary Acceptance Trials and Material Inspection Ser 523A-3658 dated 13 October 1960. Page XI-2

176 Interview with Rear Admiral Guy Griffiths. Page 39. Burrell was not completely unaware of the capabilities of the USN and had commanded HMAS *Bataan* which was attached to the US 7th Fleet. He attended the ceremony for the surrender of Japan in that role. See: "Vice Admiral Sir Henry Mackay Burrell," http://www.navy.gov.au/biography/vice-admiral-sir-henry-mackay-burrell

177 The Auditor-General, *Management of the FFG Capability Upgrade (Department of Defence - Defence Materiel Organisation)* Canberra: Australian National Audit Office, 2007. Amongst other matters, the report remarked that "…there is a four and a half year delay in the delivery of the final upgraded ship." See: Page 20.

In November 1960,[178] Cabinet met to consider the proposed three-year program submitted by Navy in July.[179] The proposal contained a recommendation for the acquisition, at a cost of £40m,[180] of two large surface escorts of the non-existent modified Hampshire class, which had been the position adopted by CNS Burrell at the 18 August COSC meeting.[181] The proposal for the Hampshires modified with Tartar, however, did not fulfil the political agenda of RAN standardisation with the USN to meet Australian alliance needs, a central consideration of Townley's enquiries about sourcing ex-USN vessels for the RAN which he had conducted throughout 1959.[182] Townley was implementing the 1957 Prime Ministerial statement on Australia's general defence standardisation with the United States,[183] which Hyslop notes had been recognised by the Naval Board as applying to the future development of the RAN;[184] but the Board appears to have not fully comprehended its scope and real impact on its options.

The summary of discussion at the November 1960 Cabinet meeting shows, *inter alia*, that it decided to "Place an order for two Guided Weapons Destroyers to be built in the United States."[185] Burrell's proposal for the Hampshires failed on two levels. The first being not recognising that standardisation with the USN meant much more to Cabinet than acquisition of a missile system. The second being that Burrell appears not to have fully comprehended the interrelated nature of the overall proposed program and the broader risks to naval capability to be incurred if the modified Hampshires failed to materialise – which was indeed a possibility. The COSC had agreed that retention of *Melbourne* as an ASW carrier brought with

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178 Commonwealth of Australia, *Three Year Naval Defence Program - 1962-1963 to 1964-1965*, Vol. NAA: A7942, D114 PART 2B (Canberra: National Archives of Australia)

179 Commonwealth of Australia, *Navy Program Proposals July 1960*, Vol. NAA: A1945, 84/3/4 ATTACHMENT B (Canberra: National Archives of Australia)

180 ibid. Summary of Recommendations

181 Commonwealth of Australia, *Navy Program of July 1960*, Vol. NAA: A8447,67/1960 (Canberra: National Archives of Australia).

182 Commonwealth of Australia, *US Naval Vessels for Australia*, Vol. NAA: A3092, 221/4/9/7/1 (Canberra: National Archives of Australia). Correspondence in this file canvasses Townley's attempts, and failure, to obtain USN ships for the RAN regardless of their capability. In Australia's application to the US for acquisition of the DDGs, Townley made it clear that standardisation with the USN was an important consideration for Australia. See: Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia). Australian Aide Memoir concerning acquisition of DDGs to Under Secretary Ball dated 7 March 1961

183 Commonwealth of Australia. *CPD [Reps] Vol 14, 4 April 1957.* Page 573

184 Robert Hyslop, *Aye Aye, Minister: Australian Naval Administration, 1939-59* Canberra: Australian Govt. Print. Service, 1990 page 3

185 Commonwealth of Australia, *Three Year Naval Defence Program - 1962-1963 to 1964-1965*, Vol. NAA: A7942, D114 PART 2B (Canberra: National Archives of Australia), page 2

it a critical need to provide it with air defence protection.[186] As Gorton had realised, but Burrell apparently had not, to delay acquisition of SAGW destroyers through waiting for the design of a modified Hampshire, also represented an incomplete solution to the wider capability requirements of the Fleet, thereby introducing a new obstacle to obtaining Cabinet agreement for the retention of *Melbourne.* Without a coherent approach which linked the timing of acquiring SAGW destroyers and retention of *Melbourne* in its new role, the window of budgetary opportunity for the RAN could close and place major elements of the RAN recapitalisation program at risk. From the political perspective, a circumstance comprehended by Gorton but seemingly not by Burrell, the Adams class represented an affordable[187] and acceptable solution for a warship with a guided missile system which also met the Government's primary requirement to become standardised with the USN, and which would be available within an acceptable timeframe at acceptably low risk. The interaction between Townley and Beale throughout 1959 in assessing USN options for the RAN and re-positioning Australia's defence alignment with its major ally had been of considerable consequence in the larger geo-strategic setting. The DDGs were an important part of that agenda. We may conclude that the RAN's leadership at this time was ill-prepared to work successfully at a high political level, and had much to learn.

USN Support for RAN Acquisition of the Adams Class

Following Cabinet's decision, Burrell wrote a lengthy Top Secret letter to Burke describing the role of the RAN saying that his "… ideal would be to have a balanced force which could act independently should the need arise and join forces with our allies as the situation dictated."[188] He went on to note that the Fleet Air Arm would not be replaced and arrival at that decision had made acquisition of SAGW destroyers by the RAN even more important. Burrell said "My choice fell on your TARTAR. As a small Navy cannot overspecialise in types of ships, the requirement was to select an "all purpose escort" incorporating TARTAR. This naturally led me to your CHARLES F. ADAMS class."[189] Burrell noted that he had recommended that Australia should acquire two modified ships of the class and that he had particularly

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186 Commonwealth of Australia, *Navy Program Proposals 1960* Minutes of COSC meeting of 17 and 24 August 1960, paragraph 4

187 Subject to discussions with the US Government – as examined later.

188 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection* Letter Burrell to Burke dated 18 November 1960

189 ibid

emphasised the need to carry two anti-submarine helicopters because he was concerned at the lack of such a capability if *Melbourne* were to go out of service.[190] Burrell had accordingly been directed by the Government to explore fully the issues of costs, feasibility of modification, and logistical considerations for the Adams class.

Burrell's letter incorporated the RAN's five options developed for the purpose of achieving the full range of capabilities it desired. He noted that if any of the options beyond that of replacing ASROC[191] with Ikara, and possibly installing VDS, were to cost more than US$2m, he would have great difficulty in gaining government approval for their purchase.[192] With regard to logistical support, Burrell said that the RAN attaché in Washington, Captain Dowson, had been advised by the USN that the RAN would be best placed to estimate the required spare parts holding necessary to support a small number of ships. Burrell nonetheless asked Burke for USN recommendations on this point. He requested the information be provided in time for the Australian Cabinet to consider the situation in January 1961.[193] Giving the USN such short notice to address such a wide range of options raises once more the question of the RAN's understanding of the magnitude of such a task and reflects negatively on its technical maturity.

Burke understood and supported what Burrell was attempting, and he responded with broad details in little over a month.[194] Burke advised "The building proposition should be handled on a Navy-to-Navy basis."[195] The USN Bureau of Ships would be the contracting authority and the RAN would be able to use existing USN training facilities; administrative costs would be the same as for the USN. US regulations did not require at that time Congressional approval for the USN to construct ships for the RAN, and the two navies could deal directly with each other over the purchase. An RAN team would be welcomed by the USN to develop the changes needed by the RAN in their ships.

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190 ibid

191 Anti-Submarine Rocket. This USN system was not fitted. The Australian designed system Ikara was installed in lieu when the ships returned to Australia.

192 This was a relatively small amount of money and how Burrell could have believed his extensive aspirations could have been achieved through such is difficult to comprehend. See: Appendix C.

193 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder BU (Vice Admiral Henry Burrell RAN) Washington DC: United States Navy. Letter Burrell to Burke dated 18 November 1960

194 ibid. Letter Burke to Burrell dated 23 December 1960

195 ibid

Burke also recommended that the US Department of State and US Department of Defense be brought into the process at the outset to obviate future hurdles. The entire process could be set in motion by the Australian Ambassador notifying the State Department. He estimated the cost as US$28.6m vice US$29.1m expected by the RAN, and did not anticipate it changing significantly in the future.[196] Burrell responded in January 1961 and remarked that he now had sufficient information to make firm recommendations, and he would advise Burke as soon as he could.[197] In March 1961, Burrell subsequently advised Burke that Cabinet had approved acquisition of two Adams class destroyers subject to financial arrangements, and noted that Ambassador Beale had been in touch with the State Department about the decision.[198]

Questions concerning DDG helicopter operations arose within the Naval Staff, resulting in two further options being created as to how the ships would provide aviation capabilities. They became known as Suggestions "A" and "B" respectively.[199] The Third Naval Member, in March 1961, sought to "…clarify any doubts which may exist at present over the Staff Requirement for operating helicopters from the CHARLES F. ADAMS…" and proposed several definitions with the intention of achieving precision.[200] In a manuscript annotation, the Deputy Chief of Naval Staff remarked pragmatically that helicopters for the DDGs should be the same as those to be embarked in *Melbourne*, but that such a type would not fit into an Adams, and that the necessary re-design work would delay the ship and contribute to increased cost.[201]

These attempts by the RAN to clarify what a Staff Requirement actually meant were indicative of its fledgling abilities in terms of crafting operational requirements. At some point, operational requirements have to be converted into technical specifications for the construction of the ship and its associated components. Where the statement of requirement is not well defined, the greater the likelihood of an imprecise technical outcome exists. While some aspects of an operational requirement can be expressed broadly to encourage the development of options, this is typically done in the formative stages of the process and not at

196 ibid
197 ibid. Letter Burrell to Burke dated 9 January 1961
198 ibid. Letter Burrell to Burke dated 13 March 1961
199 P. D. Jones, *Buying the DDGs*, page 323
200 Royal Australian Navy, *Minute by 3NM: Helicopter Facilities - Charles F. Adams (3NM Suggestions). Dated 21 March 1961. (SPC.DS.6),* Navy File 1211/207/4 Canberra: Sea Power Centre Australia. See Appendix C.
201 ibid

the end.[202] In early 1961, when contractual finalisation was imminent, the RAN should have had much greater precision as to what it wanted.

When previously acquiring ships, the RAN had been able to rely upon the great depth of technical expertise in the RN. This was not possible with an American ship, and the RAN had to rely upon answers by the USN to its questions, with the added complication that it did not necessarily know if it was indeed asking the correct questions. The RAN Naval Staff at that time consisted of approximately 20 Directorates managing various professional and functional responsibilities, none of which were large by standards later adopted by the RAN. The uniqueness of the SAGW requirements and acquisition would undoubtedly have been challenging for the expertise available at the time.[203]

Alliance Considerations of the United States and Australia

As early as 1950, the parliamentarian Mr R S Ryan had told the Australian Parliament that, as a second-class power, Australia must choose its friends wisely and gain their goodwill.[204] Parliamentarians were apparently in agreement and thought that it was unrealistic for Australia to assume full responsibility for its own security.[205] The historian Geoffrey Bolton observed that a great advantage of Australia adopting its policy was that it was cheap.[206] Australia's security relationship with the United States then had the advantage of permitting Australia to make strategic choices about its defence investments so they were of mutual value to Australia and America, and contributed to retaining ultimate protection from a great power. Australia's own defence expenditure could thereby be less than would otherwise be necessary to provide fully for itself. The notion of Australia being a medium power and having interests requiring it to be shrewdly calculating was implicit in that approach.[207]

In mid-February 1961, Townley had advised Beale that Cabinet was considering acquiring two Adams class SAGW destroyers, remarking that discussions had taken place between the USN

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202 For a contemporary account of the process for designing modern warships see: William Holland J., "Designing the Future Warships," *US Naval Institute Proceedings,* 14/1/1,313, 14 January 2015, pages 24-29

203 For an indication of the size and composition of the Naval Staff in 1960 see: Sea Power Centre Australia, *The Navy List January 1960* Canberra: Department of Defence (Navy), 1960 page 13.

204 Geoffrey Bolton, ed., *The Oxford History of Australia - the Middle Way*, Vol. 5 (1942-1988) Melbourne: Oxford University Press, 1986, pages 79-80

205 ibid

206 ibid page 80

207 John R. Hill, *Medium Power Revisited* Jervis Bay ACT: RAN Sea Power Centre, 2000. Page 6. Hill considered that "Medium powers need to be brave as lions and cunning as foxes."

and RAN and that the estimated price was A£20.092 million pounds.[208] He noted that Cabinet was favourably disposed toward the purchase and saw advantages in the degree of standardisation with the USN that would come from the purchase.[209] Townley continued that the cost of the ships represented a "considerable commitment" and Cabinet had stipulated that the purchase could proceed only if it were on satisfactory terms because other items had to be funded in the naval vote. Beale was requested to approach the United States Government with a view to exercising the US Mutual Security Act which gave credit terms of 10 years for such purposes. Townley requested that no public comment be made by the US.[210]

Beale responded on 6 March 1961 that an Australian aide memoire had been delivered to the US Under-Secretary of State for Economic Affairs on 4 March 1961. The document incorporated much of Townley's telegram and particularly noted that the ships would be standard with the USN and that it was understood that the ships "…including base spares and an original outfit of all ammunition and guided weapons…" could be acquired by Australia for US$45,200,000 per ship.[211]

Meanwhile, in February 1961, Gorton had advised the US Ambassador to Australia[212] of Cabinet approval to seek the purchase of two Adams class destroyers to be built in US shipyards.[213] Gorton remarked that Cabinet had mandated a 10 year payment period and that the Mutual Security Act had been referred to as permitting such.[214] Townley separately told the US Ambassador that Cabinet had also decided eventually to equip *Melbourne* with American helicopters, thereby helping the RAN to utilise American equipment to the greatest extent possible.[215] The increased strategic importance of Australia to the US was clearly

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208 External Canberra Telegram dated 16 February 1961. Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia)

209 ibid

210 ibid

211 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia) Australian Embassy Washington D.C. Telegram dated 6 March 1961

212 Ambassador William Joseph Sebald. See: http://www.nndb.com/gov/377/000120017/

213 United States Department of State, *General Records of the Department of State*, Vol. Record Group 59 (College Park, Maryland: US National Archives and Records Administration) Box 1684 Folder 743.56/2-1960. Incoming Telegram 13756 From Canberra dated 23 February 1961

214 ibid

215 ibid. After acquiring the RN Wessex helicopters for *Melbourne*, the RAN replaced them with RN Sea King helicopters, but fitted them with the USN AN/AQS-13 dipping sonar.

evident to the Ambassador, as was his recognition that Australia would not be dictated to where its own interests were concerned. Both elements were reflected in his recommendation to the US Department of State that Australia's request for the waiver of interest charges be agreed:

> "…we are seeking GOA assent to several highly important projects, such as VLF and VOA relay stations, and are already working on a host of space and other projects in Australia for various US Government agencies. Above accommodation would, I believe, strengthen our hand in forthcoming negotiations on some ticklish requirements we have in this staunch and generally friendly country."[216]

In March 1961, Townley provided Beale with a lengthy statement concerning the objectives of Australian Defence Policy, which stated *inter alia* that it "…is based on the concept of collective security and the highest importance is attached to participation with the United States and other allies in the regional defence organisations in South East Asia…"[217] Townley included the substance of what would subsequently be announced publicly concerning the future RAN program and noted that when the Fleet Air Arm fighters were withdrawn, the main deficiency for the RAN would be the lack of a modern air defence capability, and that two Adams destroyers would do much to overcome this problem. As a potential indication to the United States of just how far Australia was attempting to be interoperable with it, Townley added "An additional advantage would be the standardisation of these ships with the United States Navy."[218]

Townley instructed Beale to use his words in negotiating with the US Department of State and USN and provided a table containing the proposed Australian payment schedule for two ships commencing in 1961/62 for A£0.350 million, and ending in 1970/71 with a payment of A£4.184m for a total of A£40.184m.[219] Beale subsequently advised Townley on 17 March 1961

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216 ibid
217 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)* External Canberra Telegram dated 7 March 1961.
218 ibid
219 ibid

that the US Department of State would respond to Australia's aide memoire of 1 March 1961 as quickly as possible.[220]

Following an airport meeting with Townley on 4 April 1961, the US Ambassador to Australia advised the US Secretary of State that Townley hoped that agreement would be forthcoming from the US before the end of the Australian financial year because he was concerned about the appropriated funds lapsing if not committed by 30 June 1961.[221] The US Department of State responded that an early reply was likely, and that if the terms and conditions were acceptable, there would be no reason why the sale could not be finalised by the deadline.[222] As Beale had predicted, there was concern in the US Department of State that Australia was financially better off than other countries and should be able to spend more on its defence. The 10 year period of credit involved a risk of needing Congressional approval which could significantly delay proceedings, but a seven year period was offered as an achievable alternative.[223]

Confusion arose over the period of credit to be granted. Beale advised Townley on 9 May 1961 that the US Department of State had recommended approval of Australia's request for the ships and was confident that 10 years' credit would be approved, but State had gained the impression that the US Department of Defense had suggested a lesser period.[224] On 13 May 1961 the Acting Secretary of the US Department of State was advised by his senior staff to agree to a determination of seven years' credit with an attached note to be forwarded to the US Secretary of Defense giving full reasons as to why the sale should be supported.[225] There had been, it was argued, an August 1957 Presidential determination, renewed in January 1961, to urge Australia to standardise on US capabilities and hence purchases such as the DDGs

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220 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia) Australian Embassy Washington D.C. Telegram dated 17 March 1961. (The Australian aide-memoire was dated 1 March 1961.)

221 United States Department of State, *General Records of the Department of State* Box 1684 Folder 743.56/2-1960. Incoming Telegram 1323 From Canberra dated 4 April 1961.

222 ibid. Outgoing Telegram 02179 from Department of State to Embassy Canberra dated 6 April 1961.

223 ibid. State Department Deputy Coordinator for Foreign Assistance Memorandum: dated 11 May 1961.

224 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)* Australian Embassy Washington D.C. Telegram dated 9 May 1961.

225 United States Department of State, *General Records of the Department of State* Box 1684 Folder 743.56/2-1960. State Department Deputy Coordinator for Foreign Assistance Memorandum: dated 11 May 1961. The Acting Secretary is not named in the correspondence.

should be facilitated, and that acquisition of the DDGs could be expected to encourage Australia to continue looking to the US for further naval acquisitions. Although Australia's agreement to host a VLF communications station for the USN was noted, it was but one of several reasons given as to the advantages to the US of supporting the Australian acquisition of the Adams class. There was no doubting the competence of the RAN and it noted that the ability of the RAN to "…utilise these vessels effectively and to fulfil the objectives of its modernization program is beyond question."[226]

A meeting was held in the US on 17 May 1961 attended by Townley, Beale and the US Deputy Under Secretary for Political Affairs, Mr U. Johnson, with Rear Admiral L. Heinz USN representing the Office of the US Secretary of Defense. The US officers explained the risk of delay in seeking Congressional approval for a 10 year credit arrangement and highlighted that extending Australia's payments would effectively increase the price of the second ship by a sum ranging from US$800,000 to US$1,000,000. The recommended American solution was seven years of credit with eight payments to avoid triggering other processes. Townley accepted this arrangement and agreed that the final payment would be due by October 1968. Both parties agreed to proceed on this basis.[227] Subsequently, on 19 May 1961, the US Department of State made a formal offer to Australia for sale of two Charles F. Adams DDGs from the US and noted that, in defence policy terms, the US recognised that the procurement of these ships by Australia would improve the already close cooperation between the two countries.[228]

The US offer noted that construction of the first ship would commence on or about 1 December 1961, and construction of the second ship about a year later. In regard to payment, the US stipulated that the Australian Government could determine its own payment arrangements provided the full cost of the ships was met "…within three years of the date on which the vessel is delivered to the Government of Australia and that a substantial payment be made each year subsequent to 1961."[229] The offer was forwarded to Canberra the same day from Beale via telegram in which he remarked, that because of representation to the US Defense Secretary McNamara by the Embassy and Townley, the normal interest rate of 3.5%

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226 ibid

227 ibid. State Department Memorandum of Conversation dated 17 May 1961

228 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)* The Department of State, Washington, May 19, 1961

229 ibid

would be waived "…which would have meant interest charges of something over 6 million dollars."[230] Five days later, on 24 May 1961, Prime Minister Menzies accepted the US offer by telegram and included Australia's intended schedule of payments, but requested that the arrangement remain confidential between the two Governments.[231]

Formal notification of the US waiver of interest charges was advised to Canberra on 25 May 1961, but in not wanting to be seen by other nations as giving preferential treatment to Australia, the US highlighted that Australia should not publicise that US charges had been waived.[232] On 26 May 1961, the Department of State finalised a payment credit period for Australia of up to eight years,[233] and in a telegram of 28 June 1961, Townley notified Beale of his intended statement in the Australian press two days later on acquisition of the DDGs as part of his wider public statement on the naval program. The statement noted that "In obtaining two such ships, the Royal Australian Navy would be acquiring well tried and proven units, capable of playing a vital part in modern warfare."[234] Lastly, the Naval Board, having finally decided that incorporating a helicopter in the design of the Adams was impracticable, informed its Washington Attaché on 16 July 1961 that a decision to proceed "as is" had been made and that "If Ikara comes up to expectations in performance, timing and fitting, it would be fitted in lieu of ASROC."[235] The same message noted that Mark 46 torpedoes would be required and not Mark 43.[236]

The speed and efficiency of both the Australian and US Ministers and officials in securing the agreement to acquire and build warships in the United States serves to highlight how mutually

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230 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)* Australian Embassy Washington D.C. Telegram dated 19 May 1961. The agreed price of $US90m for two ships was known in the Embassy at that time. See: Commonwealth of Australia, *Australian Consulate General New York Purchase Order for 2 DDG 2 Class Destroyers. Dated 26 October, 1961 (SPC.DS.9),* Navy File 1215-201-76 Canberra: Sea Power Centre Australia. A 3.5% saving would therefore be approximately $US3.2m for two ships. Beale may have mistakenly thought the price of the ships was US$90m each, and therefore double counted the estimated saving i.e. 2*$US3.2m = $US6.4m. If this was the case, then the financial terms offered to Australia were not quite as attractive as has been thought. The disparity cannot otherwise be readily explained.

231 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia) External Canberra Telegram dated 24 May 1961

232 ibid. External Canberra Telegram dated 25 May 1961

233 ibid. The Department of State, Washington, May 26, 1961

234 ibid. External Canberra Telegram dated 28 June 1961

235 ibid. Joint Communications Message from ACNB DTG 162346Z July 1961

236 The Mk 43 torpedo may have been a mistake on the part of the Naval Board in that those torpedoes were designed for use by aircraft.

important this acquisition was from purely political and strategic perspectives. Each government was acting in its own self-interest and found points of contact in the perceived benefits each regarded as flowing from naval standardisation. While Australia paid full price for the ships, it ostensibly gained a US$6m benefit in the credit arrangements that made the acquisition more affordable within the context of Australian budgetary constraints. The American benefit was also financial, in that Australia was favouring American ship builders and manufacturers which would also involve in-service logistical support to the RAN. The longer term gain for the US eventuated when Australia later acquired the USN Perry class FFGs. The RN First Sea Lord had been prescient in 1951 when he had remarked to CNS Collins "Once a move toward the U.S. had been started, I feel it might be difficult to resist further diversions."[237]

Finalising RAN Requirements and Choices

On 23 March 1961, in parallel with Australian and American discussions, and reflecting his duty to have the details settled, Burrell wrote to the DCNS and the Third Naval Member (3NM) to finalise ship requirements.[238] He noted that while there was Cabinet approval to proceed with modifications should the Minister agree them, there were matters that required urgent finalisation. This included resolving whether installation of Ikara would be in lieu of ASROC, should the after gun be removed to provide for a hangar and helicopter deck, and if VDS should be fitted.[239] Burrell went on to pragmatically note "It is essential that all concerned understand clearly, that the final design must be sealed once costing is agreed, and that no further modifications can be permitted after that time."[240] DCNS noted that he agreed there should be a visit to the US by a suitable Captain (E) and the Director of Tactics and Staff Requirements (DTSR) designate,[241] and that both should be thoroughly briefed in Navy Office before departure. On 20 April 1961 DCNS wrote to CNS to advise that the Director of Plans was preparing documents to show that any helicopter to be carried should be capable of all-weather hovering and of carrying a weapon. This reduced the choice to a Bell or Wessex 1-3

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237 Alastair Cooper, *The Development of an Independent Navy for Australia: Correspondence between the First Naval Member and the First Sea Lord 1947-59*, page 584. Letter Fraser to Collins dated 11 May 1951

238 Royal Australian Navy, *Minute CNS to DCNS & 3NM: Charles F. Adams - Finalisation of Requirements. Dated 23 March 1961. (SPC.DS.7),* Canberra: Sea Power Centre Australia

239 ibid

240 ibid

241 Commander Maurice Molony, RAN

type and ideally, as was previously recommended, it should be the same as carried in *Melbourne*. In an indication of incomplete coordination of staff effort, in another note, Rear Admiral Urquhart commented "This study has been in hand for many weeks, incorporates all up to date information available from DAWOT and DAMR."[242]

Following a meeting on 21 April 1961 between the Naval Attaché Captain Dowson and USN staff, USN feasibility studies were conducted at Australia's request concerning modifying variation Echo of the Adams class.[243] The changes were of a technical nature driven by an enduring RAN desire to fit a helicopter to the ships and involved investigation by the USN of large scale engineering alterations to the hull and equipment to satisfy RAN requests.[244] The USN made it clear that such modifications had significant consequences to the operational capability of the ship and in particular would require removal of the after gun and placing constraints on the firing arcs of the Tartar system.[245] Investigations included replacement of the bow mounted sonar AN/SQS-23 with the much larger AN/SQS-26, about which a USN staff officer noted on the associated file covering sheet that "Believe SCB intends to use this to discourage RAN from thinking it is easy and to forestall OpNav inquiries that substitution is easy on this tight class."[246] A further note commented that "…this is not a new issue. Concur with intent to discourage RAN in this area. It would make the current invitation to bid a complete farce."[247] While the USN had been very helpful at its most senior levels, the practicalities of meeting RAN requests were regarded as very difficult at the functional level where there were pressures to award contracts and not interrupt the overall DDG-2 delivery schedule.

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242 Royal Australian Navy, *Minute DCNS to CNS: Examination of Helicopter Types for Charles F. Adams. Dated 20 April 1961. (SPC.DS.5),* Canberra: Sea Power Centre Australia.

243 United States Navy, *Records of the Bureau of Ships* Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: DDG-2 Class, Progress Report on Feasibility of Modifications Ser 440-080 dated 15 May 1961

244 See Appendix C for detailed modification requests by the RAN.

245 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: DDG-2 Class, Progress Report on Feasibility of Modifications Ser 440-080 dated 15 May 1961

246 ibid. Chief Bureau of Ships Memorandum: Feasibility Study (AN/SQS -26 in DDG-2 Class) Ser 440-0186 dated 18 October 1961

247 ibid

There are elements of this situation akin to those explored by Paul Kennedy in terms of how, at some point, practical solutions have to be found to general directions that lack detail.[248] When the overarching decisions have been made, those people involved in the day-to-day working of the organisation have to adapt what they have at their disposal and apply themselves to achieving real results. As with RAN requests to the RN concerning the County class, the USN had limited scope to fund any changes sought to their ships solely for RAN benefit. A modified Adams class would, as with a modified County class, result in the RAN owning a unique and complex warship for which its costs of ownership would be higher than those possible through largely being part of the USN supply and support chain. The political imperative of naval standardisation would have not been achieved, and in practical terms, the RAN was not yet competent to own and manage such a modified ship.

On 23 May 1961, CNS Burrell incorporated advice to Gorton as to how requirements for the ship were to be finalised through a visit to the United States by the RAN team with a report provided within three months of return.[249] Burrell noted that the fitting of a helicopter appeared feasible, although the associated technical and cost implications were not mentioned. In what seem to have been contradictory remarks, but acknowledging Government ASW priorities for the RAN, he advised Gorton that early entry of a guided missile destroyer into service was more important than carrying ASW helicopters, but then added that the ASW threat remained the primary one for the RAN to meet.[250]

Burrell eventually realised that his request for advice on multiple options had confused the USN. His primary requirement was for a ship with a surface to air missile capability also having an ASW role, rather than an ASW ship having a surface to air missile capability, and in July 1961 he provided Burke with an extensive summary of his reasoning.[251] He also revealed to Burke that when Cabinet had considered the proposal in November 1960 they suggested that only one DDG would be sufficient and that the Navy had to argue for the second ship.[252] Burrell thought that he could not win a political fight for three ships even though he could

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248 Paul M. Kennedy, "History from the Middle: The Case Of the Second World War," *The Journal of Military History,* 74, January, 2010, 35-51

249 Royal Australian Navy, *Minute CNS to Minister: Construction of DDG and ASW Capabilities. Dated 23 May 1961. (SPC.DS.1),* Canberra: Sea Power Centre Australia.

250 ibid

251 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection* Letter Burrell to Burke dated 13 July 1961.

252 ibid

have acquired three lesser capability ships for the price of two Adams.[253] He highlighted that even though he was attracted to the idea of having more but less capable ships, Burrell ultimately "… decided that the C.F.A. "as is" or possibly modified to carry Helos at the expense of one gun, would be the better for us…"[254] Putting it to rest, in the same note he told Burke that he had given up on the idea of fitting the ships with helicopters.[255]

That Burrell and his Minister had to argue with Cabinet for a second DDG is indicative of the precedence that fiscal policy concerns took over naval capability. Retention of the Fleet Air Arm with fixed wing fighters had been deemed unaffordable, and the airborne air defence of naval platforms and convoys had been determined as being the responsibility of the RAAF when within range of land-based aircraft. To contemplate that a single guided missile destroyer was capable of providing the sea-based air defence of the forces it was escorting implies a considerable faith in the capabilities of a missile system that had not yet been proven in service with either the USN or RAN. There might have been a belief in Cabinet that the probability of its operational use was extremely small and the risk was therefore minimal.

Burrell's memoir shows he was satisfied with acquiring the DDGs,[256] but he may also have been potentially very frustrated at what the RAN was expected to achieve, as set by government, with the resources at his disposal. He sensed that government direction was taking the RAN away from its comfort zone with the RN toward the USN, from which the Government had earlier investigated acquiring cheap ships of no operational value. Having to argue for a second ship probably underscored for him just how unwilling the Government was to bend its fiscal policy. But winning the argument, even if the solution differed from what he wanted, showed that a political case could still be made, and perhaps he became wiser about future planning.

Funding shortages feature consistently in the mid-twentieth century history of the RAN. Burrell's predecessor Dowling, and before him Collins, had both expressed concern at this inadequacy. The same opinion was expressed again by Burrell's own successor Vice Admiral

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253 See Appendix C.

254 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder BU (Vice Admiral Henry Burrell RAN) Washington DC: United States Navy. Letter Burrell to Burke dated 13 July 1961

255 ibid

256 Henry Burrell et al., *Mermaids do Exist*, page 263

Hastings Harrington in 1965,[257] and later in 1997 by CNS Vice Admiral Rodney Taylor.[258] The soundness of the 1954 Long Haul strategy in providing funding to sustain an appropriate level of defence capability which avoided peaks and troughs failed to resonate with those politicians who allocated resources to the RAN, and such factors are examined further in Chapter 3.

Correspondence continued between Burrell, Gorton and the Secretary of the Department of Defence until August 1961, when options for changes had to be concluded and the acquisition contract finalised. Burrell found himself dealing with circumstances over which he had marginal influence and time was running out. The Government was intent on making a decision and the RAN had no negotiating leverage with the USN for sharing any costs it would incur if changes were to be incorporated. The USN had agreed to add the RAN ships to the end of its building program and, until the German Navy[259] also purchased three Adams class ships, they were the last in that program. The RAN staff requirement for the SAGW was for a ship with capabilities more advanced than in the Adams class, but Burrell still needed a solution. In recommending to the Secretary of the Department of Defence "…early acceptance of this "letter of offer", Burrell on 30th August 1961 remarked "…the need for S.A.G.W. ships in the R.A.N. is urgent as we will have no effective air defence for the Fleet, other than close range weapons, from the time our fighters phase out in 1963 until these ships join the Fleet. Any improvement in the original proposed dates of completion will therefore be most welcome…"[260] In the final outcome, the full RAN Staff Requirement for the SAGW was unachievable and not met.

The USN accommodated minor changes sought by the RAN because they were not technically difficult to achieve. Reed notes that he was concerned with making sure that ASROC was not fitted and achieving the changes necessary to the Petty Officers' accommodation, as well as

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257 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral Sir W H Harrington 1965*, Vol. NAA: A1209, 1967/7451 (Canberra: National Archives of Australia)

258 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff & Chief of Navy: Vice Admiral R.G. Taylor RAN. Dated 30 June 1997. (SPC.DS.39.1),* Canberra: Sea Power Centre Australia.

259 They were known as the Rommel class and named *Lutjens*, *Molders* and *Rommel*. See: *Charles F. Adams Class Destroyers: Charles F. Adams Class Destroyers of the United States Navy, Kimon Class Destroyers, Lutjens Class Destroyers, Perth Class Destroyers, USS Benjamin Stoddert, USS Tattnall, USS Berkeley, USS Towers, USS Barney, USS Joseph Strauss, USS Waddell* Memphis, Tennessee: Books LLC, 2011

260 Royal Australian Navy, *Minute CNS to Secretary Department of Defence concerning S.A.G.W. Escorts. Dated 30 August 1961. (SPC.DS.25),* Navy File 1217/201/76 Canberra: Sea Power Centre of Australia.

making the wardroom (officer's mess) slightly larger by taking in part of an adjacent cabin. He recounts that Mr Tom Defoe, the owner of the Defoe shipyard where the ships were built, thought it humorous that the Australian officers wanted a bar and place to socialise in the ships whereas the USN did not.[261] Rank structures of the RAN were based on those of the RN, and therefore different from those of the USN, which affected accommodation arrangements. Unlike in the USN, it was customary to have a bar in the wardroom, and also unlike in the USN, the Commanding Officer of an RAN ship was not a member of the wardroom mess. It can be inferred that if those elements of RAN culture had not been incorporated as the ships were being built, the RAN would have done it themselves on their return to Australia.

The purchase of the RAN Adams class was reported in the Sydney Morning Herald on Saturday 1 July 1961, and Minister Gorton was quoted as saying that buying the ships from the United States could mean "a good deal of standardisation" of the RAN on American lines.[262] The article went on to quote Gorton: "…Britain generally did not have the ships Australia wanted because they were designed for the North Sea rather than the Pacific. Air-conditioning and the range of the ships were also governing factors…but the main reason we bought them was that Britain has no guided-missile destroyers of this kind developed at this stage…"[263] Gorton's remark about the main reason is disingenuous when placed against Australia's fiscal policies and political considerations of standardisation with the USN.

By July 1961, when he wrote to Burke about multiple options for changing the design of the DDGs, Burrell may have formed a view that the RAN was appearing equivocal about its requirements. Burrell's direction to his staff about finalising Ikara and helicopter options implies that he now understood that he had to demonstrate to Gorton that he knew what he wanted, not the least because having Gorton's confidence was essential politically. The 'as is' recommendation made by Burrell could be portrayed in terms of his understanding that his real political situation was, in fact, one of: 'take it or leave it'. Hyslop reflects that officers at

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261 Interview with Rear Admiral Maxwell Reed. Page 6. Doors were also fitted to heads used by the crew. Ibid page 15.

262 Australia's DDGs were, for the most part, physically standardised with those of the USN, but were dissimilar in that they were also fitted with Ikara and other unique, but relatively minor, physical requirements of the RAN. The intent of Australia's Government in achieving physical standardisation between the RAN and USN DDGs was so that they were fully capable of operating as if they were units of the USN. The necessary standardisation of procedural techniques could be expected to follow.

263 "US Methods may be Adopted by RAN," *Sydney Morning Herald, 1 July 1961*

the Naval Board level were concerned with naval detail, but did not appreciate the importance of politics or politicians to the future of their Navy to the same extent that some of their RN counterparts understood as to theirs.[264] Frame believes such a circumstance was brought about by their narrow formative education, which concentrated overwhelmingly on what they needed to know to be good seagoing officers.[265] Burrell's situation was probably an uncomfortable one for him.

The Minister for Defence announced the Australian Government decision to purchase two Charles F. Adams destroyers in Parliament on 5 October 1961.[266] Captain Dowson advised the Naval Board on 4 January 1962 that the USN contract for construction of two Australian DDGs was to be signed on 5 January 1962, and as expected, the USN BuShips had selected the Defoe Shipbuilding Company of Bay City Michigan as prime contractor. In the same advice, the Attaché noted that the "Chief of BuShips had asked when R.A.N. Engineer Officer will arrive here and there is now a degree of urgency for all additional staff proposed for this office."[267] From that point onwards the RAN was committed to a path which would lead to a growing degree of intimacy with the USN on multiple levels, and a steady decline in that with its RN benefactor. In 1965 the RAN took delivery of *Perth*, which became its first DDG and forerunner of its future order of battle incorporating nine surface combatants of USN-origin. By 1998 the RAN had disposed of its last British surface combatant.[268]

Acquiring the Third DDG (HMAS *Brisbane*)

Provision had been made for acquisition of either a third DDG or a submarine force in September 1962 when the Government approved its 1962/63 – 1964/65 Naval Programme in Cabinet Decision 437.[269] A sense can be gained of Australia's deteriorating security circumstances and emerging willingness to acknowledge that increased defence expenditure was necessary from the policy argument for the third DDG:

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264 Robert Hyslop, *Aye Aye, Minister: Australian Naval Administration, 1939-59* Canberra: Australian Govt. Print. Service, 1990, page 31

265 As quoted in Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, 1997. Page 2

266 Commonwealth of Australia, *CPD [Reps] Estimates 1961-62 Speech 5 October 1961*

267 British Joint Communications Office message dated 4 January 1962. Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*

268 See Appendix A for a summary of the RAN transition from RN to USN-origin ships.

269 Commonwealth of Australia, *Three Year Naval Defence Program - 1962-1963 to 1964-1965* Secretary Department of the Navy Letter dated 2 October 1964. Appendix 1

> "An increase in the order for DDGs from two to three will not only reduce the deficiency in escorts but will also strengthen the air defence capability of the fleet. It will ensure that one DDG can be maintained continuously in the South East Asian theatre and will provide more effective anti-submarine and anti-aircraft protection for convoys during limited war."[270]

A formal RAN enquiry was then made of the USN on 8 October 1962 by the new Naval Attaché to Washington, Captain Ian Cartwright,[271] as to whether it would be possible to acquire a third DDG. The USN responded positively on 27 November 1962,[272] and Australian Government approval was given in January 1963 to acquire the third DDG (and four British submarines).[273]

As a precursor to a visit to the United States by Minister Gorton, Beale advised that US Secretary for Defense McNamara had warned that he did not think Australia could receive the same waiver of interest as previously.[274] Gorton replied that the main object of his visit was to discuss the purchase of a third ship and that he was in fact expecting the US to provide the same terms as before.[275] Following the visit, in February 1963 Gorton advised Beale that:

> "McNamara agreed to waive interest only on condition ship is paid for in seven equal instalments beginning July this year…Missiles, ammunition, spares not included as not needed until near completion of ship when terms of payment for them will be further discussed. As only alternative is lower payments over longer term with interest at four and one-half percent on all unpaid balances I have agreed arrangement in para 1."[276]

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270 Commonwealth of Australia, *Navy Programme Proposals. DECISION 622*, Vol. NAA: A5819,VOLUME13/AGENDUM 519 (Canberra: National Archives of Australia)

271 Cartwright became the first Commanding Officer of *Perth*. Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1965 to December 1967,* AWM78-292-5 Canberra: Australian War Memorial. Page 8 (Report of Proceedings July 1965)

272 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)* USN letter OP-631D1/mjm Ser 084P63 dated 27 November 1962

273 Commonwealth of Australia, *Navy Programme Proposals. DECISION 622*

274 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)* Australian Embassy Washington D.C. Telegram dated 2 February 1963

275 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia) External Canberra Telegram dated 7 February 1963

276 ibid. External Canberra Telegram dated 21 February 1963. (Paragraphs joined.)

Multiple communications were then exchanged between Washington and Canberra which revealed a lack of clarity in terms of what was said and meant in discussions between Gorton and McNamara. This lack of precision created difficulties for both Australian and US officials in formulating the legal Letter of Offer and Acceptance (LOA) necessary for the USN to enter into contract with the RAN. Beale became exasperated at Gorton's insistence on excluding ammunition and spares from the LOA, and remarked "I urge you, if you can, to agree to this suggestion so that we may get on with business."[277] Gorton was not to be placated and thought the Americans had gone back on their word, and remarked "If we don't have enough spares and ammunition that is our business, not that of the Americans. Request you to request the Americans to keep their agreement without attaching new conditions to it; if they won't they can take their ship and do whatever they like with it."[278] As the key person responsible for managing Australia's relationship with its primary ally Beale must have thought very carefully about how he would, if at all, convey Gorton's robust message. Beale informed Gorton, that CNS Harrington, who appears not to have been involved in the issue to that point, had advised him that the spares and ammunition would be necessary in order for the USN to bring the ship to an operational state on its commissioning. Beale went on to point out that the USN was acting in Australia's interests because the longer they took to acquire, the more they would cost, and in closing Beale again appealed to Gorton "I do beg of you to dismiss from your mind any thought of United States bad faith in this matter. It is not so."[279]

That Harrington's advice had not been sought about the implications of delaying payment for ammunition and spares gives some sense of the degree of independence Gorton felt free to exercise over his portfolio. His unwillingness to consult Harrington over a naval professional matter for which Gorton's expertise was limited engenders a less positive image of Gorton's style than that of oversight of the Naval Board as described by Hyslop.[280] Gorton's confidence in his portfolio may have in fact created overconfidence in his knowledge and associated behaviour.

An updated LOA was received from the USN on 4 October 1963 showing the cost of the third ship to be US$37.632 million, and a later charge would be made on the ancillary material as

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277 ibid. Australian Embassy Washington D.C. Telegram dated 24 September 1963
278 ibid. External Canberra Telegram dated 27 September 1963
279 ibid. Australian Embassy Washington D.C. Telegram dated 4 October 1963.
280 Robert Hyslop, *Aye Aye, Minister: Australian Naval Administration, 1939-59*, page 51

ordered by Australia, but the total price of the ship as delivered to Australia would remain at US$45 million.[281] Reed recounts that when Gorton visited Bay City, Michigan, he had to apologise to his USN colleagues for the Minister's behaviour after he had insisted on opening all the windows in their office on a freezing cold day. When he gave the Minister a tour of the ship,[282] Reed remarks "…(I) took him up to the forecastle and explained to him the way the forecastle was, and the wind was blowing straight out of Canada about minus 40 and I kept him there as long as I could."[283] Reed was also of the opinion that with the USN "… (in regard to *Brisbane*) there was a bit of bad taste …with Gorton who…demanded the same conditions apply…"[284]

Acquisition of a third DDG was commented upon in Parliament on 3 April 1963, where criticism was levelled at the Government for not building the ships in Australia, and questions asked about the veracity of the proposition that to build the three ships in Australia would have cost an additional A£15 million.[285] The poor performance of Tartar at the time of Australia's purchase has been noted by Friedman[286] and it was the case that Australia had in fact embarked on the purchase of a weapon system based solely on the belief that it did work. A perception of this issue emerged in a parliamentary question to Gorton from Senator Cant[287] on 22 May 1963 who asked whether the Tartar system had been tested when the ships had been ordered.[288] Gorton gave an evasive answer which conveyed that the missile system was the reason the ship had been acquired and that it was likely that the missile system could be improved in the future, but there was no certainty of it. [289]

RAN Management of Operational Requirements and Acquisition

Although Australia had constructed its own warships in the past, they had largely been built to British designs, with some modifications, and consequently the underlying philosophy of RN designs was well understood by the RAN and its shipbuilders. This was not the case with the

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281 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)* Australian Embassy Washington D.C. Telegram dated 4 October 1963

282 The name of the ship was not recorded. It is presumed to be *Perth*.

283 Interview with Rear Admiral Maxwell Reed. Page 11

284 ibid page 15

285 Commonwealth of Australia. *CPD [Reps] Speech, 3 April 1963.* Page 3

286 Norman Friedman, *The Naval Institute Guide to World Naval Weapons Systems*, page 156

287 Australian Labor Party - Senator for Western Australia. See: http://biography.senate.gov.au/cant-hartley-gordon-james/

288 Commonwealth of Australia. *CPD [Senate] Vol 21, 22 May 1963.* Page 610

289 ibid page 611

DDGs. The USN had its own philosophies of construction and of how it manned and operated its ships, which varied from those of the RN.[290] Further, the RAN was not practiced in developing its operational requirements and managing their acquisition to the level of sophistication that the RN and USN had learned over long periods of time. As noted by Goldrick,[291] both the RN and USN possessed the characteristics of a true Navy, which included expertise in these matters, whereas the RAN did not.

Rear Admiral R. K. James, Chief of the Bureau of Ships of the USN, visited Australia in January 1962 for discussions associated with procurement of the DDGs, and was reported as saying "…the two missile carrying destroyers which Australia has bought from America…were modern and would be up-dated as they were being built to conform with requirements…the two ships will cost about £20,000,000 each…"[292] The project management arrangements were very simple and Reed notes "We didn't have a project office. I was just the assistant to the 3rd Naval Member and that was it." Reed went on to remark that there were letters from RAN staff officers to the USN, and that arrangements were made between the two organisations for their implementation. Reed notes that the USN was very helpful.[293] In effect, the RAN was buying a ship sight unseen but it had confidence the USN solution to be delivered would be adequate. At that point the RAN was unaware that Tartar was technically troubled[294] and could have taken comfort from the relationship struck between Burrell and Burke complemented by Burrell's impressions of the USN acquired during his visit to the US. The lack of a helicopter and variable depth sonar meant, however, that it was not going to be possible to deliver the full capability called for in the RAN Staff Requirement.

As we have seen, the challenges of determining the operational requirement for an advanced new class of destroyer and translating that requirement into technical specifications on this

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290 Interview with Rear Admiral Trevor Ruting 7 March 2012. Page 34. This is further remarked upon in Chapter 5.

291 James Goldrick, "A Fleet Not a Navy; some Thoughts on the Themes," in *Southern Trident - Strategy, History and the Rise of Australian Naval Power*, eds. David Stevens and John Reeve (Crows Nest, N.S.W.: Allen & Unwin, 2001), page 293

292 "U.S.A. Visitor," *Royal Australian Navy News,* 26 January 1962, Vol5 No2, page 12

293 Interview with Rear Admiral Maxwell Reed. Page 8

294 Advice provided by the RAN Washington attaché in July 1960 indicating that Tartar had an 85% probability of success for a single missile was regarded sceptically by the RAN Director of Weapons. Royal Australian Navy, *Minute RAN Director of Weapons to CNTS: Implications of the Acquisition of the US DDGs of the Charles F. Adams Class for the RAN. Dated 20 December 1960. (SPC.DS.13),* Navy File 211/207/3 Canberra: Sea Power Centre Australia.

scale were new experiences for the RAN. Deciding at such a late stage to define what the actual requirements for helicopter operations in a DDG involved, for instance, shows how much the RAN had to learn in terms of project management, regardless of the relative novelty of rotary wing aircraft at sea in destroyer sized ships and its lack of experience in such aviation matters. The RAN had underestimated the size of hull required.[295] The RAN had limited skills in conducting operational trade-off studies where the technical options for meeting requirements are costed and weighted for preference and permit informed cost-benefit analysis. It similarly did not have the technical depth of the RN ship design organisation to fall back on to help it undertake the iterative process such as was necessary to design the County class.

Given the circumstances and difficulties the RN faced with its own County class design, it could not accommodate the design effort needed to provide detailed answers to the questions posed by the RAN. In response to a February 1964 question in the British House of Lords as to why the UK had not sold the Hampshire class to Australia, the First Lord of the Admiralty (Earl Jellicoe) remarked "…Britain had been unable to meet an Australian request for two guided missile ships because of a lack of design staff…the design effort required would have caused an unacceptable delay of two or three years in the development of Royal Navy projects."[296] Gorton's assumption of delays being incurred in acquiring the modified County class through time necessary for the re-design process was thus proven valid. The crux of the DDG acquisition for the RAN was Tartar, which took on the same importance when the RAN was later seeking to replace its Daring class destroyers.

The initial proposition of the RAN for the USN to substantially modify the Adams class was no less significant than the RAN request to the RN to modify the County class. To meet the RAN requirements would have required modification of much of the Adams superstructure and machinery layout, and would have impacted on many other important aspects of the overall design.[297] The USN was in the process of building a class of 23[298] ships for its own purposes and had no requirement for a modified Adams such as was being sought by the RAN; the full

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295 Norman Friedman, A. D. Baker and Alan Raven, *British Destroyers & Frigates: The Second World War and After*, page 195

296 "Lack of Staff made U.K. Refuse Missile Ship Order," *Melbourne Age,* 21 February 1964,

297 Diagrams of the alternative DDG layouts as developed by the USN for the RAN are shown in Appendix C.

298 Raymond Blackman, *Jane's Fighting Ships 1968 – 69,* page 373

costs of such changes would therefore have had to be funded by Australia, and were unaffordable.

Ultimately the changes to the Adams design by the USN to meet the RAN Staff Requirement amounted to relatively simple modifications to accommodation compartments, making space to fit Ikara in place of ASROC, installation of a British high definition navigation radar and modifying engine telegraph controls to reflect RAN practices. The Ikara magazine was not fully protected and operational experience in Vietnam was to show that it was easily penetrated by a guided missile when *Hobart* was attacked by friendly aircraft.[299] RAN experience with the DDGs in the first Gulf War highlighted the operational deficiency of the ships in not having either their own helicopter or a flightdeck for helicopter operations as had been originally required. A feasibility study was initiated in 1991, eight years before the first ship was to decommission, which envisaged the extension of the after gun deck of the ship toward the stern, thereby providing a deck to land a small helicopter. The idea did not progress past the initial feasibility stage.[300] The original RAN Staff Requirement for a SAGW ship to be capable of helicopter operations was proven in operations to be valid, but at the time when Australian decisions were being made on acquisition, there was no practical and affordable manner for it to be satisfied.

RAN understanding grew of the necessity to manage the overall acquisition process in a more systematic way. By March 1965, and perhaps as a result of the experience it had had in managing the DDG requirement and acquisition, the Naval Board had recognised that:

> "…there was a requirement to provide for a more effective and comprehensive initial planning procedures at the formulation stage of planned projects…A second requirement was for improved procedures to provide for more effective

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299 Royal Australian Navy, *Accidental Attack on HMAS Hobart by US Aircraft in Vietnam Waters (SPC.DS.20),* Navy File 68/1381 Canberra: Sea Power Centre Australia. (*Hobart* message 171120Z JUN 68 "(missile)…then penetrated Ikara magazine deckhead level with after magazine bulkhead, part of missile lodged in magazine…")

300 Royal Australian Navy, *RAN DDG Modernisation Project - Re-Engining of DDGs and Other Enhancements: Naval Engineering Services Branch: DDG Helicopter Feasibility Study 23 May 1991 - Navy File 89-23269 Pt 1(SPC.DS.61.1),* Canberra: Sea Power Centre Australia.

control and supervision of the progress of large projects once they had been approved."[301]

A working party was formed to examine the problem and make recommendations which, by October 1965, resulted in a list of projects that were to be managed through project coordination arrangements.[302] At that time, a fourth DDG was under consideration to replace *Voyager* lost in the collision with *Melbourne*[303] but, showing that there were still more lessons to be learned, the third Naval Member advised the Naval Board that "The fourth DDG hardly warrants a Project Officer unless it is intended to introduce large alterations. The whole DDG programme including support facilities has passed out of the Project stage and it should be possible to handle problems by the normal Department procedures."[304] As will be seen, this was an overly optimistic view of actual circumstances, and remedial action was necessary later to overcome serious logistical support problems which arose through the RAN not understanding their tight linkage to modern operations and the management arrangements necessary to make them effective. Experience with the DDGs was to reveal the consequences of not understanding such complexities.

The effective management of requirements and acquisition took more time to be learned by the RAN. John Jeremy was the Managing Director of Cockatoo Island Dockyard in Sydney and recorded the practical consequence of issues the Naval Board was attempting to remedy when he noted that *Swan* and *Torrens*, the last of the Type 12s commissioned in 1970 and 1971 respectively[305] "…were built without a specification or even a contract. The ships were

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301 Commonwealth of Australia, *Naval Board Minutes 1965: Meeting of 25 March 1965*, Vol. NAA: A2585 1965 (29-31/65) (Canberra: National Archives of Australia)

302 Commonwealth of Australia, *Naval Board Minutes 1965: Project Co-Ordination 1965-68 Programme Minute 1285/201/47. Dated 2 September 1965.*, Vol. NAA: A2585 1965 (77-80/65) (Canberra: National Archives of Australia)

303 *Voyager* was replaced by HMAS *Duchess*, a Daring class destroyer loaned quickly by the RN to the RAN after its loss of *Voyager*, and later purchased. It enabled the RAN to meet its obligations in South-East Asia. See: Alastair Cooper, "1955-1972: The Era of Forward Defence," in *The Australian Centenary History of Defence Volume III. the Royal Australian Navy*, ed. David Stevens (Melbourne: Oxford University Press, 2001), 181-209, page 203

304 Commonwealth of Australia, *Naval Board Minutes 1965: Minute by 3 Naval Member. Dated 17 October 1965.*, Vol. NAA: A2585 1965 (77-80/65) (Canberra: National Archives of Australia)

305 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, page 298

designed as they were being built, with the inevitable delay and cost escalation associated with the lack of pre-planning."[306]

Gorton's and Burrell's Legacy - Acquisition of the DDGs

The ability of Burrell and a very small team to take about a month discussing options with the RN and USN, and then to make a recommendation to the Minister for the Navy, which in turn produced the RAN force structure for almost four decades to come, was how things were done in the early 1960s. It was practical and flexible, but the process was not without its risks and complications, including limitations incurred through inexperienced personnel. Rear Admiral Oscar Hughes had extensive experience in major capital acquisition, including for a long period as project director for acquisition of the Collins class submarines.[307] He contrasted the circumstances of the time when the DDGs were acquired with those subsequently and remarks:

> "…life was simpler in a way then because Navy had management and control of its own destiny… and Navy did have direct access to Government via its Minister…and it had everybody that was needed…today it's just so long-winded and demanding and exhausting and time consuming…in those days… providing you got to the Minister and you could find the money, you went ahead with it."[308]

The decision to purchase the Adams was taken based on Australian political priorities which acknowledged but overrode the recommendations of the RAN. Regardless, from the outset the RAN was able to operate the DDGs professionally, as was observed by the USN to the

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306 John Jeremy, "Australian Shipbuilding and the Impact of the Second World War," in *The Navy and the Nation: The Influence of the Navy on Modern Australia*, eds. John Reeve and David Stevens (Crows Nest, N.S.W.: Allen & Unwin, 2005), 185-209, page 205

307 For the *Collins* story and Hughes' role see: Peter Yule and Derek Woolner, *The Collins Class Submarine Story: Steel, Spies and Spin* Port Melbourne, Vic.: Cambridge University Press, 2008

308 Interview with Rear Admiral Oscar Hughes, 26 March 2012. Page 7. The Department of Defence later produced a comprehensive array of instructions to guide those who undertake both the development of requirements and acquisition of defence equipment. The process can be expected to further evolve. See: Department of Defence (Australia), *Defence Capability Development Handbook 2012* Canberra: Defence Capability Development Group, 2012. And: Department of Defence (Australia), *Defence Procurement Policy Manual (2013)* Canberra: Defence Materiel Organisation, 2013

Minister for the Navy during his visit to *Hobart* whilst on operations in Vietnam.[309] The extensive changes which eventually affected the RAN, and how it evolved as a consequence of the acquisition, can be viewed as somewhat serendipitous, because without the political agenda and will to acquire the Adams class the outcome would have been completely different. Notwithstanding, Gorton and Burrell each made a considerable contribution to initiating that change, and hence have an enduring legacy in shaping the more **confident** and more clearly Australian Navy which emerged.

Conclusions - Impact of the DDGs on Australia and its Interests

This chapter has examined how the DDGs were acquired as a direct function of Australia's national interest when Australian defence policy in the late 1950s was deliberately being reoriented towards the United States and away from Britain. Acquisition of the DDGs for the RAN was an important expression of Australia's political-strategic intent. The expeditious facilitation of the acquisition was also in the strategic self-interest of the United States. For Australia's Government, the actual operational capability of the ships was less important than their ability to be fully interoperable with the USN, and even with Gorton's commitment to having a more capable Australian Navy, it might have chosen less expensive ships had they been available.

Following the Korean War, Australia's military services had been unable to propose a force structure acceptable to Government. Consequently, in 1954 the Government implemented the 'Long Haul' policy, designed to impose greater discipline on how Australia's force structure was matched to its perceived strategic threat, to Australia's alliances, and to how much the Government was prepared to pay. The deterioration of Australia's geo-strategic circumstances and rapidly changing naval technologies had combined in 1959 to create a situation for the RAN wherein its political leader lacked confidence in its operational capabilities. Regardless, the expense of the Fleet Air Arm was more than the Government believed it could afford and in 1959 the fixed wing fighter aircraft were slated for removal in 1963. Removal of the fighters embarked in *Melbourne* left the fleet vulnerable when operating outside the range of land based air defence aircraft, a situation that the Government knowingly accepted at the time.

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309 Commonwealth of Australia, *Naval Board Minutes 16 August 1968*, Vol. NAA: A2585, 86-93/68 (Canberra: National Archives of Australia). The Minister at that time was The Hon Charles Kelly MP.

In the 1960s, the methods by which RAN operational requirements were developed, options considered, decisions arrived at and acquisitions undertaken were nascent in comparison with the sophistication gradually introduced during subsequent decades. Acquisition of the DDGs gave impetus to the RAN to develop methods for acquisition that it had previously relied upon the RN to provide. The degree to which the RAN felt able to ask both the RN and USN for options to change significantly the design of the advanced County and Adams class destroyers respectively suggests that the RAN had not appreciated how much the post-war technological revolution had made its prior classes of ships obsolescent. Nor did it appreciate the technical and operational implications that such advances introduced. Neither the RN nor USN could accommodate the SAGW requirements of the RAN. The RAN experience in building *Torrens* and *Swan* without either a design or contract in the early 1970s showed that improvement was still required in defining operational requirements and managing their delivery, as we shall see again in Chapters 3 and 4.

Defence against Soviet-developed anti-ship missiles became a major problem for Western navies from the early 1960s. Being capable of very high sub-sonic speeds, the missiles were faster than WWII aircraft and they carried warheads capable of inflicting major damage or even sinking the ships they struck. Towards the end of WWII the RN and USN commenced development of surface to air missiles to meet their expectation of how the future air battle would be fought, but by 1960 they could not reliably counter the emergent Soviet threat. Any transit by the RAN toward or through the vast Indonesian archipelago to Australia's north would have brought it within the range of Soviet made Styx and Kennel missiles acquired by Indonesia in 1962, which at that time had strained relations with Australia.[310] Indonesia's proximity to Malaya and Singapore could prevent the RAN from being able to remain consistently outside their range should it have to operate in that area. Delivering land based air cover by the RAAF would be extremely demanding in such circumstances, even if RAAF deployments were made to Christmas Island and potentially to Papua New Guinea, Manus Island, Malaysia or Singapore.

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310 Australia's 'Confrontation' with Indonesia lasted from the early-1960s to 1966. See: Alastair Cooper, "1955-1972: The Era of Forward Defence," in *The Australian Centenary History of Defence Volume III. the Royal Australian Navy*, ed. David Stevens (Melbourne: Oxford University Press, 2001), 181-209, pages 197-201

As the RAN evaluated options for a surface to air missile capability for air defence, it found that its long standing friendly patriarch, the RN, was unable to field a missile system in which the RAN had confidence. The RAN knew of technical problems with Seaslug, but not those of Tartar, which were not resolved until shortly before *Perth* finished being built. The DDG analogue combat system was the most modern in the RAN, but its performance against the Styx missile was regarded as suspect by the USN. As we shall see in Chapter 4, less than 10 years after their acquisition, the ships commenced their first major modification program to their combat systems and introduced the RAN to the era of digital computer systems.

The political importance of Australian standardisation with the USN combined with an extremely tight Defence budget meant that CNS Burrell had very little financial latitude to modify significantly either the County or Adams class, regardless of how accommodating the RN and USN might have been. The RAN interpretation of standardisation extended primarily to obtaining the Tartar missile system, and Burrell really wanted RN County class ships fitted with Tartar. His choice would not only have failed to meet the political imperative of naval standardisation and a closer relationship with the United States, but it would also have introduced considerable and multi-faceted risk and cost. Without the attractive credit arrangements provided by the United States, however, Australia's frugal policies for defence expenditure may have resulted in it forgoing the acquisition. Those arrangements were a measure of how important Australia, and the RAN, were becoming to the United States. Australia's combination of political direction and financial policies meant that Burrell's only real choice was between having something, or nothing. He interpreted the mood of Cabinet as one of wanting to achieve closure, and recommended proceeding with the "as is" version of the Adams class.

The major early impact of the DDGs on Australia and the RAN was in giving effect to the political objective of standardisation and achieving full interoperability with the USN. The FFG Project Director, Captain Nigel Berlyn[311] considers RAN experience in acquiring the DDGs as directly relevant when later acquiring the FFGs, and changes to RAN methods of project management and operational logistic support owed much of their evolution to the DDGs.[312] Introduction of the DDGs marked the commencement of a major transition from RN to USN

311 Later Rear Admiral

312 Nigel Berlyn, "RAN FFG Acquisition," *Journal of the Australian Naval Institute,* 2, 3, August 1976, 27-36

platforms and systems by the RAN, as well as adoption of numerous USN methods and practices which have continued well past the service lives of the ships.[313] Those changes enhanced the RAN's professional confidence as it progressively increased its competence in modern operations and technical and materiel support while simultaneously decreasing its dependence upon the RN.

In strategic terms, the decision to acquire the Adams class was made by Australia's political leadership solely on the basis of Australia's national interest. The RAN was in this an instrument of Government policy and implemented that decision. Political objectives came first and, as Hyslop has noted, the Naval Board needed "… to be politically astute, but not partisan."[314] Acquisition of the DDGs was a salutary demonstration of its need to learn to be more politically astute.

313 Adoption of the USN Standard Missile series (SM-1) by the RAN in the mid-1970s will continue with SM-2 and potentially SM-6 being installed in the RAN Hobart class now building. The RN Seaslug missile system and County class were both replaced as soon as the RN could introduce Sea Dart and its next class of destroyers.

314 Robert Hyslop, *Aye Aye, Minister: Australian Naval Administration, 1939-59*, page 4

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Chapter 3 – The DDGs and Australian Defence Policy: 1972-2009

> "…when (the) DDGs were paid off, the view was expressed that the FFGs made as much of a contribution to an American carrier battle group as did the DDGs. They did not. The DDG is a much better ship from that air warfare fit. So we never made an argument that there needed to be that level of capability in the Australian defence forces, and that meant that the Government could get away with getting rid of it."[1]
>
> The Honourable Kim Beazley AC, Minister for Defence 1984-1990

This Chapter examines the evolution of Australia's strategic defence policy from entry of the DDGs into RAN service in 1965, through to their final departure in 2001. Developments from the mid-1950s are incorporated for context, and discussion extends briefly to 2009 in order to illuminate enduring naval policy issues related to the capability of the ships. The impact of the DDGs is examined in terms of their interaction with Australia's evolving defence policy and the RAN's force structure. The chapter demonstrates the consequences incurred by a nation and its Navy when there is inconsistent alignment between political objectives, enduring strategic principles (in this case concerning the security of an island nation which regards itself as a medium power), and long term force structure planning for expensive major naval capabilities necessary to provide policy options to the Government.

For 37 years following withdrawal from Vietnam (1972 to 2009), Australian Federal Governments of both major political parties[2] found it necessary to conduct significant reviews of defence policy so as to establish the degree of resourcing they deemed appropriate. The Department of Defence also conducted reviews designed to institute efficiencies in force structure evolution for the Services. For the most part, government resourcing pronouncements exceeded actual commitments and efficient force structure management was problematic, and the capabilities represented by DDGs were affected by this context.

The chapter demonstrates that the DDGs gave important foreign and defence policy options to the Government for most of their service lives, particularly in support of Australia's relationship with the United States. Weakness is also evident in the planning of the surface

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1 Interview with the Hon Kim Beazley, 4 September 2014.

2 Australia's primary political parties during the period covered in this thesis are referred to as the Coalition (Liberal and National Parties) and the Labor Party.

combatant force structure of the RAN as its ships wore out or became obsolete. As Kim Beazley notes in the epigraph to this chapter, the capabilities represented by the DDGs had insufficient impact on Australia's political leadership to warrant perceived urgency in their replacement.

Introduction

Effective defence policy is difficult to develop, not the least because it must deal with a myriad of complex interacting issues, each of which can have multiple and incompatible factors associated with them. Some of these issues include national interests, political policy preferences and the prosperity of the nation. Complicating these considerations are the behaviours of other nation states and non-state actors who have their own interests to further. Effective defence policy also provides clarity of direction whilst ideally providing flexibility and room to cater for likely circumstances, sometimes known as credible contingencies. Hedging against some circumstances that are highly unlikely but potentially devastating if they should materialise is important in national security terms. Policy which is too tight in its direction, in a field as prone to change as international relationships, can limit the options of government to shape and eventually achieve satisfactory outcomes. The effectiveness of defence policy, as in any area involving very long range perspectives, is typically judged in retrospect.

Strategic defence policies are therefore affected by a number of pressures, and to be relevant they need to be reviewed with sufficient frequency to ensure their current suitability. Evolution of the associated military force structure is difficult to influence quickly because of the long service lives of major platforms and systems, where 30 years or more is common. The generally high cost of these capabilities makes it important that careful consideration be given to the widest range of their application so that flexibility exists to meet changing circumstances without requiring major adjustments to the current or planned future force. Unless there is a deterioration of security circumstances, such as occurred in Australia's 'Confrontation' with Indonesia from the early to mid-1960s, the evolution of defence policy and changes to major elements of military force structure can be expected to proceed at a moderate to slow pace. Government policies in other areas will impact on this process and can be a contributing factor to inconsistencies in defence policy and its implementation.

From its inception, the RAN had been an important element of Australia's national power which the Government could employ to impose its will through force or the threat to use force, or to achieve outcomes not involving force for which RAN capabilities provided the wherewithal. Throughout this period the RAN worked increasingly with the Australian Army and RAAF to exploit their collective capabilities in joint operations, as well as increasingly with the USN. Conversely, the RAN decreasingly operated with its RN counterpart.

Reaching the end of their working lives does not provide the sole reason for replacing platforms or systems. The capabilities they contribute to the whole fighting force must be judged to have strong relevance for their replacement to have high priority for funding. The greater their flexibility and adaptability, the more it is possible for major platforms and their systems to contribute effectively to a variety of operational circumstances. For some platforms and systems it may be preferable to pay more to obtain a capability that has a wide range of applications and potential for development and modernisation, rather than acquiring a potent capability of narrow utility but less cost. Defence capabilities provide policy options to government, and having breadth of applicable utility at multiple levels of conflict or in a variety of political circumstances has national strategic value beyond a purely operational military function.

The combination of long operational lives and the high cost of replacement necessitate a strong requirement for discipline on those responsible for force structure planning. In the Australian context it is highly desirable to separate the timing of very large capital programs so that they do not by their coincidence place restrictions on affordability and the associated national capability. Paul Dibb provides a helpful discussion of the intricacies of force structure planning for middle powers such as Australia in situations where there is no clearly defined threat. The process should be intellectually rigorous and flow from a strategic analysis from which detailed force structure principles and acquisition strategies are derived, priorities are established and resource allocation made so that the required force can be financed.[3]

From when they were delivered in 1965 to their final departure in 2001, the Adams class DDGs were regarded by the RAN as their most capable surface combatants. They were purchased when Australia was faced by an unfriendly Indonesia, the security situation in Vietnam was

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[3] Paul Dibb, *Planning a Defence Force without a Threat : A Model for Middle Powers* Canberra: Australian National University, 1996, page 4

deteriorating, and the United States had replaced Britain as Australia's primary defence ally. As we have seen, the DDGs were acquired as a function of Australia's self-interest in furthering its relationship with America. Australia's political leaders at that time broadly comprehended the utility of the RAN as an instrument of Government policy and the role of the DDGs in giving it effect. Examination of Australia's subsequent defence policies shows that at the political level, an understanding of the role of the RAN, and of its force structure requirements for surface combatants, was only intermittently evident thereafter.

Evolution of the RAN – Long Haul to Vietnam

A brief examination of the RAN's evolution from 1954 to 1972 provides context for the policy changes it had to accommodate in its development post 1972, from which time the Australian government became more clearly focussed on achieving its objective of greater defence self-reliance.

For much of the period following the 1954 Long Haul policy, the RAN had endured resource shortages, which in 1959 caused CNS Burrell's predecessor, Sir Roy Dowling, to express his frustration over the lack of funds.[4] As was shown in Chapter 2, the Australian Government chose the DDGs because there was no cheaper option available from the United States. When writing in March 1961 to the Australian Ambassador to the United States, the Minister for Defence, Mr Townley, had justified seeking favourable US financial terms on the basis that acquisition of the DDGs would meet US expectations of Australia being more self-sufficient in its membership of SEATO, for which the US had been pressing.[5] The RAN seemed unable to make progress with Australia's Government in having it understand how its short term funding decisions had long term force structure consequences for the Navy, a situation, as will be shown, that existed for decades.

The Strategic Basis of Australian Defence Policy in 1964 had noted that "Australia could be involved in war if Indonesia under-estimated Commonwealth reaction to her confrontation

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4 Royal Australian Navy, *Vice Admiral Sir Roy Dowling RAN - Brief Report on Relinquishing the Post of First Naval Member and Chief of Naval Staff. Dated 23 February 1959. (SPC.DS.36.1),* Canberra: Sea Power Centre Australia. Page 7.

5 External Canberra Telegram dated 7 March 1961. Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia) page 3

activities in Malaysia."[6] As also previously shown, the DDGs had been acquired in part as Australia's response to the growing military capabilities of Indonesia. None-the-less, in February 1965 and as the first RAN DDG was nearing completion of building, Burrell's successor, Vice Admiral Sir Hastings Harrington, gave the Government formal notice that the RAN was unable to meet its responsibilities. Harrington's report, addressed to the Ministers for the Navy and Defence, and the Prime Minister, said "…that even at the end of the current Three Year Plan in 1968, the Navy would not be able to meet the requirements (of its responsibilities)."[7] Harrington went on to say (original text in capitals and underlined): "WE ARE OUT-GUNNED, OUT-RANGED, AND GENERALLY OUT-SPED BY THE INDONESIAN NAVY."[8] Harrington felt strongly that the RAN had been inadequately considered by the Government in the overall policy and planning for the defence of Australia. He continued:

> "…I am convinced that it is upon the command of the sea that our national safety depends and I believe the time has come when something must be done to restore the Navy to its proper place in the community so that in conjunction with the Air Force we may exercise whatever maritime power we are able to develop."[9]

The Secretary of the Prime Minister's Department was advised in April 1965 that Harrington's "… report does great credit to him."[10] And later that "…the C.N.S. is making a most vital point – as we have done – that our Navy has nothing to counter the Indonesian Navy."[11] In commenting as to why the DDGs were acquired and making an acknowledgement of their operational limitations, A.T. Griffith[12] also remarked "We were faced with these unpleasant facts when the decision was taken to purchase the missile cruisers. Missile ships with the

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6 Stephan Frühling, *A History of Australian Strategic Policy since 1945* Canberra: Defence Publishing Service, 2009, page 322

7 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral Sir W H Harrington 1965*, Vol. NAA: A1209, 1967/7451 (Canberra: National Archives of Australia), page 3

8 ibid

9 ibid page 7

10 Commonwealth of Australia, *Internal Minute to Secretary of Prime Minister's Department by A.T. Griffith regarding Haul Down Report of Vice Admiral Sir Hastings Harrington RAN. Dated 1 April 1965.* Vol. NAA: A1209, 1967/7451 (Canberra: National Archives of Australia), page 1

11 ibid page 4

12 Griffith's position in the Department is not shown but he is probably Allan Thomas Griffith, a First Assistant Secretary, whose responsibilities included international affairs. See: "Griffith, Allan Thomas (1922-1998)," Australian National University, http://oa.anu.edu.au/obituary/griffith-allan-thomas-444

present armament must principally be justified against a concept of making available to the Americans a piece of the Australian Navy to fit in with their Task Force system."[13] Griffith's brief continued: "They are however defensive ships but they are the Navy's capital ships…every service needs an attack role. The Navy as it is at present conceived is an entirely defensive instrument."[14] In short, Griffith's remarks underscore how the DDGs were acquired primarily as an instrument of Government policy to further its credentials with an ally, and how, as long as Australia's Government was confident that the ships were of value to the United States, their actual capability and value to the RAN was a second order consideration. It was fortunate for the RAN that a cheaper option did not exist. Harrington's own successor, Vice Admiral Sir Alan McNicoll, was invited in April 1965 to comment on Harrington's remarks. McNicoll used the opportunity to provide a wide ranging assessment of what he had inherited, and while not directly critical of government, he supported Harrington by noting that there were two overwhelming reasons for the poor state of the Navy. The first was not having enough specialised manpower, and the second was that there were not enough ships.[15] McNicoll acknowledged that a suitable ship to boost the RAN's number of destroyers was unlikely to be available at low cost, and instead advocated acquisition of a fourth DDG – but without success.[16]

The USN commenced delivery of the DDGs to the RAN in 1965, and from 1967 through to 1972 they were employed almost exclusively on operations in Vietnam when, for the first time in its history, the RAN was engaged in combat operations to which the RN was not committed.[17] Being of USN-origin, the DDGs gave the Australian Government the immediate policy options it had desired by providing an important naval combat contribution to the Vietnam conflict.

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13 Commonwealth of Australia, *Internal Minute to Secretary of Prime Minister's Department by A.T. Griffith regarding Haul Down Report of Vice Admiral Sir Hastings Harrington RAN. Dated 1 April 1965.* Page 1

14 ibid page 2

15 Response by McNicoll to Harrington Report. Undated in the NAA file but datable to *circa* April 1965. Page 1. Contained in: Commonwealth of Australia, *Personal Papers of Prime Minister Menzies: Haul Down Report by Vice Admiral Sir Hastings Harrington [Includes Comments by Alan McNicoll and Secretary, Department of the Navy, and Correspondence from Hon F C Chaney Re Skyhawk Aircraft]*, Vol. NAA: M2576, 51 (Canberra: National Archives of Australia)

16 ibid page 6. Response by McNicoll to Harrington's report. Undated in the NAA file but approximately April 1965.

17 Alastair Cooper. "1955-1972: The Era of Forward Defence." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001. 181-209. Pages 208-209.

Jeffrey Grey, in the official RAN history of the Vietnam War, noted that after the war Australia found itself in a strategically different circumstance from that when it entered, by which he meant that Australia had shifted significantly away from Britain towards the United States in terms of important defence relationships.[18] The DDGs had been an important enabling element of Australia's defence and foreign policies in making that strategic shift.

As Australia withdrew from the Vietnam War and conducted its 1972 Defence Review, the 12 surface combatants of the RAN comprised three modern Adams class guided missile destroyers, six relatively modern River class destroyer escorts and three obsolescent Daring class destroyers. The most powerful ship of the Navy was its flag ship the aircraft carrier *Melbourne* with its A4 Skyhawk fighter-bombers, S2E Tracker ASW aircraft and Wessex ASW and general-purpose helicopters.[19] *Melbourne* was equipped with the rudimentary capabilities necessary to support a Flag Officer and staff for the command and control of naval forces at sea. A proposal by Navy in 1964 to equip *Melbourne* with a number of sensor and command capabilities similar to those of the DDGs had not been approved,[20] but shows that the capabilities of the DDGs were already anticipated as being significant in its future order of battle.

The RAN and Major Australian Defence Reviews - Post Vietnam

The Department of Defence and each of the military services collectively underwent numerous major and minor reviews in the period from 1972 to 2009. Some reviews involved far reaching examinations of 'how Defence does its business', typically with the intention of making the entire organisation more efficient so as to release resources to fund current and emergent strategic and operational needs. The 1973 Tange Review presaged the Department of Defence organisational model that largely existed until 2015,[21] and is important as being the point from which single service policies became subject to greater central direction. The Defence

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18 Jeffrey Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972* St. Leonards, N.S.W: Allen & Unwin in association with the Australian War Memorial, 1998, page 1

19 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, page 297

20 Commonwealth of Australia, *Department of Navy Three Year Program - 1965/66 to 1967/68*, Vol. NAA: A1945, 84/3/10 (Canberra: National Archives of Australia) Secretary Department of the Navy letter dated 28 October 1964

21 The wide ranging 'First Principles Review' conducted of Defence in 2015 has not been included in this examination. See: David Peever, *First Principles Review of Defence - Creating One Defence* Canberra: Department of Defence, 2015.

Efficiency Review of 1996/97 and the Strategic Reform Program of 2009 are two examples of efforts to harvest and reapply resources.

The 13 major reviews conducted over this period are summarised in Table 1 and create the framework for this chapter, because they all involved the DDGs in some manner.[22]

Table 1: Summary of Major Defence Strategic Reviews Post Vietnam

Year	Title
1972	Australian Defence Review
1973	Australian Defence Reorganisation (Tange Review)
1976	White Paper - Australian Defence
1986	Review of Australia's Defence Capabilities (Dibb Review)
1987	White Paper - The Defence of Australia 1987
1989	Australia's Strategic Planning in the 1990s
1991	Force Structure Review 1991
1993	Strategic Review 1993
1994	White Paper Defending Australia
1997	Defence Efficiency Review
1997	Australia's Strategic Policy
2000	White Paper - Defence 2000 - Our Future Defence Force
2009	White Paper - Defending Australia in the Asia Pacific Century: Force 2030

The Australian Defence Review - 1972

The *Australian Defence Review*[23] was presented to Parliament on 28 March 1972 by the Minister for Defence, Mr Fairbairn.[24] Although endorsed by the Minister, the Review had been prepared by the Department of Defence and was not technically a White Paper. Its purpose was "… to inform the public generally of the nature and extent of Australia's defence capabilities, of the foreseeable or contingent roles of our forces, of the environments in which

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22 Other more focussed reviews of specific matters have not been included, such as investigations into the Collins submarine project, personnel and conditions of service matters, logistical arrangements, and commercial support programs. They were individually significant but not as germane to the subject of this thesis.

23 Commonwealth of Australia, *Australian Defence Review*

24 Commonwealth of Australia. *CPD [Reps] Vol 13, 28 March 1972.* Page 1247

these must be envisaged and of the resources involved in sustaining them."[25] In setting the scene, the Review made it clear that defence policy must serve the objective of achieving the independent security of Australia and that there must be an ability to counter any threats that present a risk to freedom of choice in making decisions. It noted that defence of Australia was not simply about the static defence of the continent, but must provide for a range of Australian interests.[26]

The Minister noted that having ended its combat commitment in Vietnam, Australia had the opportunity to give greater emphasis to the longer term factors confronting the nation. In this regard he considered that Australia needed forces that gave it greater independence of choice and achieved a higher level of self-reliance.[27] He used the term 'self-reliance' on five occasions, emphasising that the Government believed that Australia had to do more for itself than in the past, and that its capability for greater self-reliance would contribute to obtaining real support from allies in a time of emergency.[28] The former Minister for Defence, Kim Beazley, has since remarked on the continuity of philosophy on the part of Australia's two major political parties in acknowledging the importance of self-reliance for national security, which had first emerged in the early-1960s and has since endured.[29]

In March 1972, Minister Fairbairn drew attention to the Soviet naval presence in the Indian Ocean and noted that it might require the deployment of force to the area.[30] From February 1973 the RAN's DDGs commenced rotational deployments to the Indian Ocean to demonstrate Australian presence, thereby giving clear effect to Australia's regional strategic policy.[31] Strategist Colin Gray observes that "A Navy can provide the presence that expresses national concern without necessarily threatening a potential adversary. The reason why naval power is

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25 Commonwealth of Australia, *Australian Defence Review*, page 1

26 ibid

27 Commonwealth of Australia, *CPD [Reps] Vol 13, 28 March 1972.* Page 1253

28 ibid page 1250

29 K. Beazley, "Navies, Diplomacy and Maritime Power Projection," in *Naval Diplomacy and Maritime Power Projection (Proceedings of the Royal Australian Navy Sea Power Conference 2013)*, ed. Andrew Forbes (Canberra: Sea Power Centre Australia, 2014), 95-102, page 96

30 Commonwealth of Australia, *CPD [Reps] Vol 13, 28 March 1972*. Page 1251

31 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1973 to December 1973,* AWM78-292-10 Canberra: Australian War Memorial. Page 16

so preferred is because it offers prudent policymakers optimum flexibility."[32] Australia at that time used the DDGs to put that form of government strategic preference into practice.

The ability of the RAN's DDGs to work effectively with American forces and particularly deployed US naval forces had been demonstrated in Vietnam, and with the Indian Ocean deployments they again provided visible Australian support to its most important ally. Beazley notes the value of the DDGs as being able to operate very effectively with USN Battle Groups, thereby giving confidence that the RAN was a first rate Navy, and as such contributing to Australia's relationship with the United States.[33] The deployments, again without an association with the RN of any significance, contributed to a further loosening of ties with Britain and aided the RAN's attaining a clearer sense of identity while building its self-assurance. Dibb remarks that it was the 1972 Review "… that first registered in the public mind that the fundamental objective of Australian defence policy was the independence and security of Australia, rather than forward defence in Asia as a subordinate ally of the United States."[34] Dibb could have added Britain in a previous era to his assessment. From a naval perspective, the 1972 Review acknowledged how the finite life of warships imposed a need for long term planning because "…by the early 1980's some of the RAN's operational destroyers will reach the end of their useful lives."[35] The same Review also noted that decisions would be required as to whether to modernise four of the River class and upgrade the combat system of the DDGs.[36]

During the late 1960s the RAN had created a project to acquire a new light destroyer, generally known as the DDL Project, as part of the Government's intention to remedy the expected future shortage of surface combatants. Rear Admiral Guy Griffiths recounts a meeting with CNS Vice Admiral Alan McNicoll concerning the DDL, during which McNicoll expressed concern about how large the proposed ship had become. Griffiths comments that what McNicoll really wanted was a ship of only about 1,500 tons but with most of the capabilities of a DDG as well

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32 Colin S. Gray, *Modern Strategy* Oxford: Oxford University Press, 1999, page 220
33 Interview with the Hon Kim Beazley. Page 3
34 Paul Dibb, *Planning a Defence Force without a Threat : A Model for Middle Powers*, page 7
35 Commonwealth of Australia, *Australian Defence Review*, page 23
36 ibid

as helicopters, and for some reason expected it could all be fitted into a small hull. Griffiths' opinion was that "…seniors have to be terribly careful about trying to keep updated."[37]

Commodore Ormsby Cooper was a member of the DDL Project and remarks that it had "grown like Topsy".[38] He felt that the Naval Staff, as did others, kept adding ideas that were not analysed or coherent. During a visit to the United Kingdom he gained the impression that the British would be very impressed if Australia could build a ship of the capability being sought for the price it wanted to pay. The RN First Sea Lord had been similarly surprised in 1961 when RAN CNS Burrell had thought that relatively small warships could carry significant modern combat capabilities.[39] The RAN had little experience of managing the scale and complexity of such a project, and when it was told that such a task entailed the generation of tens of thousands of drawings, it became evident to the Project that this was much more difficult than contemplated. Cooper considers that the cost of, and timescales for, constructing a modern warship were seriously underestimated by the RAN.[40] In this regard the RAN appeared not to have yet learned from its earlier experiences in negotiating with the RN and USN concerning options for modifying the County and Adams classes respectively.

Cabinet consideration of the New Destroyer Project in June 1972 affirmed the concerns of Griffiths and Cooper.[41] Operational requirements for the DDL included the USN Standard Missile system because it was the same as fitted to the DDGs,[42] two armed helicopters, one 5"/54 gun and other capabilities which collectively would have required a ship of substantial size. The RAN proposal to Cabinet included a comparison of four ships, of which the USN Patrol Frigate[43] was categorised in a list of "Ships of deficient capability". A reason given for

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37 Interview with Rear Admiral Guy Griffiths, 13 and 19 January 2012. Page 34

38 Interview with Commodore Ormsby Cooper, 18 October 2011. Page 23

39 Eric Grove, "Advice and Assistance to a very Independent People at a most Crucial Point: The British Admiralty and the Future of the RAN 1958-60," in *Maritime Power in the 20th Century - the Australian Experience*, ed. David Stevens (St Leonards, N.S.W: Allen & Unwin, 1998), 135-155, page 150

40 Interview with Commodore Ormsby Cooper. Page 22

41 Commonwealth of Australia, *New Australian Naval Destroyer Proposal - Decision 1051 and 1090 (ADHOC) 28 June 1972*, Vol. NAA: A5908, 702 (Canberra: National Archives of Australia), 1-225)

42 The original Tartar missile system underwent several modifications, eventually being transformed into the Standard Missile. Raytheon Company (USA), *STANDARD MISSILES Public Release Portfolio Revision F (2012) (SPC.DS.27),* DSER # 214754 Washington DC: Raytheon Company. By 1972 the RAN was anticipating adoption of the Standard missile for its DDGs as part of its digital upgrade.

43 The Patrol Frigate subsequently became the Oliver Hazard Perry class FFG (FFG-7).

the categorisation included the lack of a 5"/54 gun which prevented it providing naval gunfire support. Other remarks included: "Its air defence capability is good. Margin for growth, habitability, and damage control arrangements are all less than those required. Its inherent reliability is less than other alternatives since it has single screw propulsion."[44] The RAN document also pointed out that the Patrol Frigate was not yet an approved project for the USN.[45]

In August 1972, in the same announcement of having approved the digital modernisation and update of the DDGs and an extended refitting program of the Australian constructed River class destroyer escorts, the Government advised that it had decided to construct three destroyers to a new Australian design at Williamstown, Victoria.[46] In a lengthy statement in the *Navy News* of September 1972, the Minister for the Navy, Dr Mackay, explained that amongst other criteria considered important for the DDL had been the requirement for long range and extended time on station, as well as providing air defence to other units.[47] In contrast with the management arrangements for acquisition of the DDGs in the 1960s, a formal project had been created led by a designated RAN Project Director with associated responsibilities.[48]

Following a change of Federal Government from Conservative Coalition to Labor, the DDL project was cancelled in August 1973, but the new Defence Minister, Mr Lance Barnard, did acknowledge that approximately $1.7m had been spent on preparatory work which would be useful in a new project. In the same announcement, the Government recognised "…the importance of naval strength to Australian defence preparedness and has endorsed the need for a new destroyer acquisition program."[49] In continuing, Mr Barnard confirmed that the

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44 Commonwealth of Australia, *New Australian Naval Destroyer Proposal - Decision 1051 and 1090 (ADHOC) 28 June 1972*, 1-225)

45 ibid

46 Commonwealth of Australia. *CPD [Senate] Vol 34, 22 August 1972.* Page 237

47 "Navy Minister Explains Why the Govt has Chosen the DDL," *Royal Australian Navy News,* 15 September 1972, Vol15 No19, pages 2-3

48 Royal Australian Navy, *Australian Navy Orders 358/72 to 363/72 (358/72 - the Management of the DDL Project). Dated 10 January 1972.* (Canberra: Sea Power Centre Australia)

49 Commonwealth of Australia. *CPD [Reps] Vol 34, 22 August 1973,* page 241

decisions announced by the previous government[50] to upgrade the DDGs with modernised guns, Tartar and a digital combat system would still proceed.[51]

The Government subsequently examined alternative solutions to the cancelled DDL, and in that process the Department of Defence evaluated 50 different ships of between 720 and 5,000 tonnes to establish which might best meet its requirements. The previously unsatisfactory USN Patrol Frigate was regarded as providing the best value for money. That it was expected to be part of a production of 50 ships for the USN was also important.[52] The CNS[53] preferred to have three ships than the two sought by government, and remarked that even with its shortcomings "…a better solution to the acquisition of destroyers is unlikely to be found."[54] Cooper considers that collapsing the DDL project was a very sensible step, and that "…the FFG in some ways wasn't the greatest ship in the world but on the other hand it filled the gap pretty quickly."[55] Captain Christopher Skinner was the Director for the later Anzac Frigate program and in a reflection of the lessons learned from the DDL experience he remarks "… we were never thinking of designing a ship ...the DDL sort of experience had made sure of that."[56]

The *Tange Review* of 1973[57] and its subsequent implementation[58] instituted fundamental changes to the way in which the Department of Defence and the three Services were organised and coordinated. It was a significant review because it imposed a more centralised method of force structure development on the three Services, and removed much of the ability for each Service to act independently *inter alia* through removal of each single Service

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50 Commonwealth of Australia, *Modernisation of Royal Australian Navy's DDG's - Decision 1091(AD HOC) 13 July 1972*, Vol. NAA: A5908, 703 (Canberra: National Archives of Australia)

51 Commonwealth of Australia, *CPD [Reps] Vol 34, 22 August 1973,* page 241

52 Commonwealth of Australia, *New Destroyer Project - Decision 2185 7 April 1974*, Vol. NAA: A5915, 1005 (Canberra: National Archives of Australia), page 3.

53 CNS at that time was Vice Admiral Sir David Stevenson. See: David Stevens, ed., *The Australian Centenary History of Defence: The Royal Australian Navy*, Vol. III Melbourne: Oxford University Press, 2001, page 312

54 Commonwealth of Australia, *New Destroyer Project - Decision 2185 7 April 1974*, Vol. NAA: A5915, 1005 (Canberra: National Archives of Australia), page 4

55 Interview with Commodore Ormsby Cooper. Page 23

56 Interview with Captain Christopher J. Skinner, 1 February 2013. Page 45

57 Department of Defence (Australia), *Australian Defence: Report on the Reorganisation of the Defence Group of Departments. Presented to the Minister for Defence, November 1973 (Tange Review)* Canberra: Dept. of Defence, 1973

58 "Commonwealth Numbered Acts - Defence Force Re Organization Act 1975," AUSTLII, http://www.austlii.edu.au/au/legis/cth/num_act/dfroa1975256/

Minister. Implementation of the *Tange* reform coincided with adoption of a force structure policy referred to as that of the 'core force'. The underpinning philosophical concept being that peacetime tasks should be capable of being undertaken by a versatile force structured to deal with credible contingencies, and providing the basis for expansion in the expected warning time as necessary.[59]

The 'core force' policy gave priority to assessing future requirements based on emergent technologies and threats, but for the RAN it left open the question as to how many surface combatants were the minimum required to meet its obligations. During this period the RAN had successfully sought government approval to modernise the DDGs but the number of surface combatants had not changed. The impact of the DDGs on how the RAN was choosing its future ships at that time is evident by mandating that the Standard Missile system fitted to the DDG (SM-1)[60] be fitted to the ship to be acquired under the DDL Project, which eventually became the USN Patrol Frigate. The RAN was still learning how to manage operational requirements and, as believed by Cooper in relation to the DDL project, the discipline needed in developing and controlling the requirement was still not present.[61]

Australian Governments have historically shown little appetite for spending money on defence projects where they sense a high degree of unmanaged risk. There are few opportunities to obtain Government approval to construct a new class of warships, so the consequences of failing to convince Government can be difficult to overcome. For the RAN to return to government extolling the virtues of the USN Patrol Frigate, a class of ship it had previously declared unsuitable, was potentially a signal that it was in the same position that it had been when the government decision was made to acquire the Adams class. The aspirations of the RAN, as represented by its DDL preference, and as were present in the case of the DDGs, again did not match what was available from either the USN or RN. It was therefore once more in the position of having to make important capability compromises through not having the resources to fund and acquire a uniquely designed warship that fully met its needs. In that sense nothing had changed from when CNS Burrell had advised the Minister to take the DDGs

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59 Derek Woolner, "The Purchase of the American FFG-7 Frigate in the Context of Future Equipment Policy for the Royal Australian Navy," *Journal of the Australian Naval Institute,* 3, 3, August 1977, 17-37, page 34

60 SM-1 was to be fitted to the DDGs as part of the upgrade to the Tartar missile system and as a component of the then future NCDS update program.

61 Interview with Commodore Ormsby Cooper. Page 22

"as is".[62] The RAN's acquisition of the FFGs was, akin to that of the DDGs, an initiative whereby it was better to have something than to have nothing, and it would have to make accommodation in its practices as necessary to operate the ships. Having a strong doctrinal basis clearly written in plain language would likely have been of help to those who had to understand the complexities of naval warfare to assess the issues involved, but the RAN did not have its first such document until the year 2000.[63]

The Government announced in April 1974 that it had decided to acquire two Patrol Frigates from the USA, [64] and that because of the heavy workload in Australian dockyards and cost penalties, it had also decided that the ships would be constructed in the United States.[65] On a subsequent change of Federal Government from Labor to the Coalition, the Minister for Defence, Mr Killen, announced on 18 February 1976 that two FFG-7 Frigates would be acquired from the United States with "…some relatively minor modifications in the RAN version..." and that Australia was "…joining this program on very advantageous conditions."[66] The latter remark implied that as with the DDGs, the US had seen benefits to both the USN and RAN in their navies operating similar classes of ships and had been prepared to accommodate the RAN within its overall program of construction. Senior US policy officials who had earlier supported sale of the Adams class to Australia had shown some foresight when they noted that "Coordination at this policy level will be enhanced by the encouragement which this transaction will inspire for Australia to continue looking to the United States for cooperation and guidance in matters affecting Australian security."[67]

In a comprehensive *Navy News* article of 27 February 1976, the Government decision was reported to readers as "DDL Project scrapped again!!"[68] The article said that, amongst other considerations, the importance was recognised of minimising "…logistic problems which would

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62 Royal Australian Navy, *Minute CNS to Minister on Decision to Purchase Two DDG. Dated 29 June 1961. (SPC.DS.8),* Canberra: Sea Power Centre Australia.

63 Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2000*, 1st ed. Canberra, ACT: Defence Publishing Service, 2000

64 The Oliver Hazard Perry class – abbreviated as the Perry class and also as FFG-7.

65 Commonwealth of Australia. *CPD [Reps] Vol 15, 9 April 1974.* Page 1235

66 Commonwealth of Australia. *CPD [Reps] Vol 8, 18 February 1976.* Page 40

67 United States Department of State, *General Records of the Department of State*, Vol. Record Group 59 (College Park, Maryland: US National Archives and Records Administration) Box 1684 Folder 743.56/2-1960. State Department Deputy Coordinator for Foreign Assistance Memorandum: to US Secretary of Defense dated 16 May 1961 (Attachment Page 2)

68 "Government Confirms Purchase of US-Built Frigates for the RAN," *Royal Australian Navy News,* 27 February 1976, Vol19 No4, Page 1

have been created by introducing different weapon systems requiring additional support into a relatively small Navy."[69] Some understanding of the complications and costs of supporting multiple types of ships with modern digital combat systems was therefore evident in the selection process. To have the same missile system and essentially the same command and control system in the DDGs and FFGs was seen as a sensible and cost effective solution.[70]

It is evident that there was still an inability on the part of the RAN and the Government to create coherent plans for the future of Australia's surface combatants. Agreeing to construction of the Perry class in the United States was a rational approach when the complexities of their construction were balanced against Australia's lack of industrial sophistication which, as we have seen, had contributed to *Torrens* and *Swan* being built without an approved design or effective contract.[71] Australia's ability to use skilled labour in a continuing program, such as undertaken when the River class was approved to follow construction of the Darings,[72] had evaporated through no further Australian naval constructions being authorised. The speed with which decisions were taken to acquire both the Adams and Perry classes of ships would also likely have created extreme pressure and risk for management arrangements and provision of industrial capabilities for their construction in Australia. Post WWII, the interplay of naval warship construction and management of political risk had become an enduring theme for the RAN and the Government. In 2002 the Department of Defence unsuccessfully proposed to government an Australian naval ship construction and repair plan which would time the supply of new ships for the RAN at the most economical point of removing older ships from service.[73] Senator Gorton had shown no interest in building the DDGs in Australia, thereby avoiding probable delays, cost increases and the political risk caused by inadequate industrial performance.

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69 ibid

70 The impact on the RAN of introducing the USN Junior Participating Tactical Data System/Naval Combat Data System is examined in Chapter 4.

71 John Jeremy, "Australian Shipbuilding and the Impact of the Second World War," in *The Navy and the Nation: The Influence of the Navy on Modern Australia*, eds. John Reeve and David Stevens (Crows Nest, N.S.W.: Allen & Unwin, 2005), 185-209, page 205

72 Commonwealth of Australia, *Naval Construction in Australia for RAN - Anti-Submarine Frigate Programme 4 August 1950*, Vol. NAA: A4639, 151 (Canberra: National Archives of Australia)

73 Department of Defence (Australia), *The Australian Naval Shipbuilding and Repair Sector Strategic Plan* Canberra: Defence Materiel Organisation, 2002b.

White Paper 1976 - Australian Defence

Australian Defence, the Defence White Paper of 1976, was presented to Parliament by the Minister for Defence, Mr Killen in November 1976.[74] The Department of Defence had continued to use a series of documents known as 'Strategic Basis' papers to provide a synthesis of classified information and policy recommendations to government.[75] But this was the first publicly released White Paper that attempted to provide clarity of government defence policies and to articulate their rationale in an unclassified manner. The defence program was to evolve over the course of five years and it was stated that financial decisions would follow normal government processes for the approving of expenditure.[76] In Chapter 1 of *Australian Defence*, it was recognised that Australia could not rely solely upon the United States for its security:

> "As a not insubstantial local power, Australia is able to influence developments. Remote from Europe, we now have one significant alliance—the ANZUS Treaty, with New Zealand and the US. Both countries are important to us; but it is prudent to remind ourselves that the US has many diverse interests and obligations."[77]

The document highlighted that "…naval general purpose forces undertake peacetime and operational tasks ranging from sovereignty control to maritime defence, throughout the neighbourhood and the region."[78] The policy also recognised that when the two Daring class destroyers were due to retire in 1982-83, "…two new guided-missile Frigates (FFGs) will be in service. Each of the FFGs will carry two helicopters, which will add a new dimension to the operations of the destroyer force."[79] The paper noted that the operational lives of the older River class destroyers were being extended through a modernisation program, as were those of the DDGs through their own modernisation. In looking forward to the early 1980s, provision was made to increase the number of destroyers from 11 to 12, which meant that "…eight to

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74 Commonwealth of Australia, *Australian Defence (Defence White Paper 1976)* Canberra: Australian Government Publishing Service, November 1976
75 Stephan Frühling, *A History of Australian Strategic Policy since 1945*, page 3
76 Commonwealth of Australia, *Australian Defence (Defence White Paper 1976)*, Introduction
77 ibid page 2
78 ibid page 19
79 ibid

nine destroyers would be available at any one time."[80] The possibility of acquiring a third FFG was also noted,[81] and was subsequently announced in the context of an election policy statement by Prime Minister Malcolm Fraser on 21 November 1977.[82] Referring to the DDGs, the 1976 White Paper went on to note that "These three guided-missile destroyers are expected to remain operational until the 1990s."[83] It was stated that a force of up to 12 destroyers was being contemplated and that investigations had commenced into "…the concepts, characteristics and cost of follow-on destroyers, preferably for construction in Australia…The number of destroyers to be acquired will also depend on the decision whether to replace the aircraft carrier HMAS Melbourne in the longer term."[84]

The invasion of Afghanistan by the Soviet Union in 1980 triggered a response by the Australian Government to strengthen the ADF.[85] For that program of expansion the Government announced that it had instructed the Department of Defence to discuss with the United States how it could acquire and bring into service a fourth FFG as expeditiously as possible, and that the three DDGs (and Oberon submarines) would be fitted with the US Harpoon surface to surface missile.[86] Following a change of Government from Coalition to Labor in 1983, one of its first decisions, without consulting the RAN, was that *Melbourne* was not be replaced and that the RAN's carrier oriented fixed wing aviation capabilities were to be disposed of.[87] It further decided to construct an additional two FFGs in Australia at Williamstown,[88] which would eventually bring the total number of FFGs in the RAN to six. In response to the Soviet presence, at government direction the RAN commenced another series of DDG deployments to the North West Indian Ocean to again cooperate with US forces. The June and July 1982 *Reports of Proceedings* by *Perth* describe the typically wide range of operations conducted by

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80 ibid
81 ibid
82 Commonwealth of Australia, *Prime Minister Policy Speech 21 November 1977,* Canberra: Commonwealth of Australia.
83 Commonwealth of Australia, *Australian Defence (Defence White Paper 1976)*, page 19
84 ibid pages 19-20
85 Commonwealth of Australia. *CPD [Senate] Vol 8, 19 February 1980.* Pages 16-25
86 ibid pages 23-24
87 Peter Jones, "1972-1983: Towards Self-Reliance," in *The Australian Centenary History of Defence Volume III. the Royal Australian Navy*, ed. David Stevens (Melbourne: Oxford University Press, 2001), 211-238, page 228
88 Commonwealth of Australia. *CPD [Reps] Vol 33, 12 October 1983.* Page 1659. Williamstown was at that time a Government owned naval dockyard adjacent to Melbourne, Victoria.

all three DDGs,[89] often in concert with major units of the USN, in executing government policy of supporting the major ally and making an Australian contribution to international security.

Review of Australia's Defence Capabilities - 1986 (The Dibb Review)

In February 1985, Mr Paul Dibb was tasked by the Minister for Defence, Mr Kim Beazley, to "undertake a review of Australia's defence capabilities" and a report was produced that "provides the basis and rationale for the structure of the Australian Defence Force (ADF) over the next decade."[90] Dibb's report, entitled *Review of Australia's Defence Capabilities*, was a precursor to the Defence White Paper of 1987. In that context, Dibb's report did not represent any official position,[91] but the importance of Dibb's work to the future force structure of the Navy, and indeed to each of the Services, was considerable. The CNS, Vice Admiral Michael Hudson, viewed it as "a welcome development for the Navy."[92] The 1986 Review's far reaching implications for the RAN are examined next before turning to the ensuing 1987 White Paper.

Dibb's report was not without its critics and Mr Ian Sinclair as the Opposition spokesman on Defence was reported as disagreeing with its strategic assumptions and labelling it as "Fortress Australia",[93] a proposition rejected by Mr Beazley.[94] Nonetheless, the report provided the Minister with an underpinning rationale for subsequent decisions by Government concerning the priorities for defence capabilities to be funded over the longer term. The Dibb Review reflected the prevailing policy guidance whereby the concept of 'warning time' was an important consideration in how the force structure of the ADF should evolve. Dibb remarked that the official strategic guidance indicated that Australia would receive at least 10 years warning of a major threat. His view was that constant monitoring was therefore required by Australia's intelligence agencies of regional developments for signs of change. Additionally,

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89 Royal Australian Navy, *Reports of Proceedings, HMAS PERTH (1978 - 1999),* Canberra: Sea Power Centre Australia. Pages 635-649. Such tasks included visits to East African, Sri Lankan and Indian Ocean ports for support to Australian diplomatic initiatives, as well as frequent integration with a USN carrier battle group, and operations with the USN in the Northwest Indian Ocean monitoring Soviet activities in the region.

90 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence* Canberra: Australian Govt. Pub. Service, 1986, Covering Letter

91 ibid page iii

92 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1),* Canberra: Sea Power Centre Australia. Page 4

93 "Dibb Report Rejected as 'Fortress Australia'," *Sydney Morning Herald* , sec. Features, 5 September 1986, page 5

94 K. Beazley, *Navies, Diplomacy and Maritime Power Projection*, page 95

Dibb remarked that Australia's defence policy should envisage maintaining a military advantage in both capabilities and technology.[95]

Dibb criticised previous arrangements and considered that ADF force structure planning had "…not been comprehensively addressed."[96] He noted that "The Review could obtain no material centrally endorsed by the higher Defence structure which explained, for example, the strategic rationale for a 12-destroyer Navy, three fighter squadrons, six Regular Army battalions and an Army Reserve target of 30,000."[97] Dibb's remark seems aimed at the lack of an agreed coherent Defence-wide strategy which shaped force structure planning, rather than the judgments of the single services which had arrived at those numbers through their own processes as informed by their experiences. Dibb also found that strong disagreement existed between civilian and military staff about what levels of warfare should be planned for and that their relationships had become adversarial. In what might be regarded as a clash of cultures, Departmental officials believed that the priority for planning should be given to credible low-level contingencies and having a base for expansion as needs arose, whereas the military were of the opinion that planning should be conducted on the basis of preparing for larger scale commitments.[98]

Such a situation clearly had significant financial and other ramifications for how much real, rather than theoretical, capability each military service should have at its disposal to meet government policy objectives. The cost of major warships is high and driven by a variety of factors, not the least being the increased cost of advanced technology.[99] For Australia in the mid-1980s, although the FFGs were regarded as operationally inferior in some aspects to the DDGs, each FFG was approximately twice the purchase price of a DDG.[100] The anticipated 10 year warning period would probably be insufficient to substantially increase the size of the surface combatant force unless suitable ships were available from other countries for speedy

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95 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence*, page vi

96 ibid

97 ibid

98 ibid

99 A 2006 report addressing the long term costs of USN destroyers showed real increases to be approximately 2.1% per annum. Mark V. Arena, *Why has the Cost of Navy Ships Risen? : A Macroscopic Examination of the Trends in U.S. Naval Ship Costs Over the Past several Decades* Santa Monica, CA: RAND, 2006, page 2

100 Derek Woolner, *The Purchase of the American FFG-7 Frigate in the Context of Future Equipment Policy for the Royal Australian Navy*, 17-37, page 19

acquisition. If those countries to which Australia might turn were similarly increasing their forces, the timely acquisition of ships could prove to be very difficult. Peter Jennings notes that in the Australian context, the length of major acquisition programs comprises several Federal election cycles, and that "…broad bipartisanship on big defence projects is valuable but difficult to deliver."[101]

Dibb recommended that the policy staff of ADF Headquarters be increased and the operational requirement and force structure planning staffs of the single services be abolished.[102] Such a proposal would likely have been controversial and not without resistance from the Services, not the least because the force structure of each military service is always a matter of great concern for its leadership. To have responsibility as the leader of a military service for its future development, but to be placed principally in an advisory role where professional military judgement is open to question or in danger of being overturned by those without relevant expertise, potentially constrains the ability of those charged with delivering operational performance in times of conflict. Conversely, being able to explain to officials and politicians in layman's terms the nuances of military judgement, including the consequences of various courses of action, is a key skill required of all senior military leaders, and Dibb's report implied that it was not always present.

Dibb gave some consideration to the question of threats to shipping and trade, and was of the view that Australia could not be successfully blockaded. Nor was Australia's economy sufficiently vulnerable to warrant a capacity to protect trade at a great distance from home. He remarked that although there was a need to study the impact of interruption of shipping on Australia's economy, any problems that might arise could be dealt with by evasive routing of the ships.[103] CNS Hudson disagreed with Dibb's treatment,[104] and later expressed concern that the Review was incorrect in making "…the assumption that Australia's economy was not

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101 "The Tempo of Election Cycles does Not Benefit Big Defence Projects," *The Australian,* 14 February 2015, Jennings was the Executive Director of the Australian Strategic Policy Institute and a former Deputy Secretary in the Australian Department of Defence.

102 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence*, 176, page vi

103 ibid page 2

104 See for instance: Neil Ralph, "Australia's Maritime Trade: The Problem of Defence," *Journal of the Australian Naval Institute,* 2, 2, 1976, 6-11 and Christopher Barrie, "The Protection of Shipping - what some Strategists Think," *Journal of the Australian Naval Institute,* 5, 4, 1979, 34-39

particularly vulnerable to interdiction of overseas trade."[105] As major units of the RAN, it could be expected that the DDGs would form an important part of any military response to a real or prospective interruption of Australia's maritime trade.[106] The 1987 White Paper would generally adopt Dibb's views, although Beazley clearly had an opinion that threats to Australia's shipping could not be ignored. In 2013 he noted in retrospect that studies had:

> "…revealed the possibility of challenges in a substantial array of threats to coastal shipping and wider sea lanes, offshore and onshore critical northern assets and population centres…five choke points were identified in the South-East Asian, South Pacific archipelagos which we needed to be able to defend."[107]

In lower level contingencies Dibb postulated that naval forces would be dispersed across the north and north western approaches to Australia. The Review recommended acquisition of a new class of ocean patrol ships to complement the FFGs and DDGs. Dibb argued that the number of higher level ships in the RAN should be held at nine, comprising six FFGs and three DDGs, but that studies should be conducted to inform judgements that would be required in the early 1990s as to what replacement, if any, there should be for the DDGs.[108] Herein Dibb recognised that some higher level naval capabilities were required, and later pointed to the fact that after the removal of *Melbourne* there had not been a reconsideration of the destroyer numbers in the fleet to compensate for any change in force structure requirements.[109]

Dibb held the view that the best air defence of naval ships would be provided by land based aircraft, whereby the ships would be operating under an air umbrella. He believed that credible contingencies would probably be in Australia's area of direct military interest,[110] and on that basis, land based air defence would be complemented by surface ships fitted with air defence missiles. Accordingly, RAAF fighter forces should be capable of deployment over

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105 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1),* page 5

106 Convoy protection was a contributing reason for the acquisition of a third DDG. See: Commonwealth of Australia, *Navy Programme Proposals. DECISION 622*, Vol. NAA: A5819,VOLUME13/AGENDUM 519 (Canberra: National Archives of Australia)

107 K. Beazley, *Navies, Diplomacy and Maritime Power Projection*, page 97

108 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence*, page 8

109 ibid page 124

110 Ibid. Map 1 of the *Review* shows this to be a substantial proportion of Australia's geographic region.

Australia's northern maritime approaches because air superiority in those areas was an imperative for operational success. Air to air refuelling to aid in the provision of air defence for naval shipping was therefore also of a high priority.[111]

The 1986 Review advanced the notion that FFGs could match most operational capabilities of the DDGs. It noted that "The essential needs for ASW, area air defence and maritime strike, so much as destroyers will contribute, seem likely to be met by the FFGs which could provide a minimum protective capability, especially in northern focal areas."[112] The Review recognised that the FFGs would be in service until at least 2010,[113] and noted the age of the DDGs and their expense to operate, as well as the fact that their crew size was almost twice that of an FFG. Dibb's assessment drew attention to the changes in naval technology since the DDGs had been acquired, particularly in the area of anti-ship missile defence, and to the limitations of the DDGs to meet that challenge. His remarks imply that RAN force structure planning had not comprehended the future challenges that it could have to deal with, and that by 1986 some of the capabilities of the DDGs were already obsolescent.[114] Those remarks were important, but destined not to be heeded.

The Review recognised that the DDGs possessed better command and control, radar and gunnery capabilities than the FFGs, as well as having a twin missile fire control system, as opposed to the FFG single channel, and observed how the DDGs were expected to operate. Dibb remarked:

> "To the extent that destroyers are expected to operate in less complex battle environments than those for which they were designed, and in smaller numbers, their command requirements would not be the same as for a 'task group'. This consideration, and the high operating cost and age of the DDGs, leads this Review to have some concerns about their continuing relevance to the fleet."[115]

The Review made an assumption that the multifaceted task group operations that the DDGs were designed to be part of were no longer necessary, or would otherwise not be demanding.

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111 ibid page 9
112 ibid page 128
113 ibid
114 Chapter 4 incorporates an examination of the second major modernisation of the DDG combat system that commenced in the mid-1980s.
115 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence* Canberra: Australian Govt. Pub. Service, 1986, page 128

The capabilities possessed by DDGs for that role were therefore less important. This represented a considerable misunderstanding of how command and control of naval operations took place in practice, and of the critical importance of organising naval forces to apply power in the appropriate manner. The practice long adopted by the RAN and its major allies had indeed been to form task groups, not only because of the complementary nature of the capabilities of its units, but because a group of units became considerably more effective in combination than as single entities. In practice, naval task groups were, and are used, as an organising principle for almost any type of naval operation regardless of the threat or complexity.[116] Hence, although Dibb commented on a lack of work in defining the RAN destroyer force after the departure of *Melbourne*, there was no recognition that the afloat command and control capabilities provided by *Melbourne* had been absorbed by the DDGs. The ships had limitations in fulfilling that role, however, due to their lesser communications capabilities and lack of physical space to accommodate an embarked senior officer and associated staff. Notwithstanding, after the departure of *Melbourne*, the DDGs acted routinely as RAN task group command vessels on multi-ship deployments and for the major international exercise of RIMPAC, usually conducted bi-annually in the Hawaiian and proximate naval exercise areas and hosted by the USN.[117]

The Review discussed the re-development of the RAN's Maritime Headquarters[118] and utilisation of improved communications and command support systems, but these were all related to shore based facilities as distinct from those required afloat.[119] In due course,

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116 Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2010*, 2nd ed. Canberra, ACT: Sea Power Centre Australia, 2010a, pages 136-137

117 RIMPAC is claimed to be the world's largest and most complex naval exercise. Details of RAN (and DDG) involvement in RIMPAC are shown at Appendix K. Between 1971 and 1980 the *Melbourne*, with one or two DDGs in company, participated as the RAN task group commander for exercise RIMPAC on each of the seven occasions it was conducted near Hawaii. From 1982 until 1998, a DDG provided task group command for six of the eight RIMPAC exercises and RAN deployments conducted in that period. The RAN's task group deployments occasionally continued from Hawaii to North and South East Asia as part of Australia's naval interaction with its regional neighbours.

118 Maritime Headquarters (Sydney) was not constructed until after the Dibb Review, but was then equipped with an advanced computer assisted operational intelligence system acquired from the USN. Such systems provide command support to operations, they do not command operations. See: Aviation Week & Space Technology, "Electronic Intelligence - Royal Australian Navy (OBU for RAN)," *Aviation Week & Space Technology,* 131, 11, 1989, 117. The RAN referred to the Project as the Navy Command Support System (NCSS).

119 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence*, pages 91, 147 & 148

highlighting the difficulty of predicting operational needs, and therefore the intrinsic value of having platforms and systems capable of performing as wide a range of tasks as possible, *Brisbane* would embark the RAN task group commander during its deployment to the first Gulf War, but it would require changes for the ship to be made ready.[120] Dibb noted that understanding trends in the future survivability of destroyers against stand-off missile attack would be necessary, and highlighted the issue as an important consideration in terms of how, or with what, the DDGs should be replaced.[121] Dibb's advice on this point was important. Defeat of such threats was a very difficult task, and it took considerable time and effort to achieve a relevant and credible capability in both the FFGs and Anzac Frigates, with the latter class of ships not demonstrating proof of performance against a real supersonic air target until 2013.[122]

Summing up all of the factors associated with destroyers, Dibb considered that the RAN had an essential requirement for eight or nine ships. Conversely, Beazley believed that the RAN needed at least 17 surface combatants to meet its role, and he had hoped that New Zealand might contribute its ships to increase the total to 20.[123] Dibb noted that a final decision to replace the DDGs was not needed until the early 1990s because:

> "… the DDGs will start to pay off from about 1998. Preliminary studies should commence at that time (1986) …with a view to funded studies being placed with industry in the later 1980s to refine procurement options. A Government decision on source selection would probably be needed in the early 1990s."[124]

Dibb's encouragement to Defence to take the time needed for careful planning for any replacement of the DDGs would fail to produce a coherent result.

The RAN introduced its doctrinal concept of Tiered Surface Combatants at the same time as Dibb was conducting his review.[125] Its purpose was to broadly delineate banded levels of

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120 Royal Australian Navy, *HMAS BRISBANE Reports of Proceedings, January to December 1991 (SPC.DS.59.1),* Canberra: Sea Power Centre Australia. Page 8

121 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence*, page 129

122 Janes Navy International, "ANZAC ASMD Upgrade Package Completes Final Acceptance Trial," *Janes Navy International,* 10 September 2013, 1-2

123 Interview with the Hon Kim Beazley. Page 6

124 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence*, page 129

125 ibid page 130

capability for different types of surface combatants to aid in understanding the qualities needed to perform their various roles.[126] CNS Hudson considered Tier One to comprise the DDGs and FFGs, which "…have the ability to operate effectively in a multi-threat environment in company with allied forces. The capability of these ships in terms of endurance, primary weapons fit and command and control suite allowed these ships to fit into the multi-national force in the Gulf."[127] Hudson considered the River class frigates to be Tier Two ships, and the Fremantle class patrol boats to be Tier Three. He remarked that "They (Tier Three) could contribute significantly to the Navy's peacetime tasks, but they have a very limited capability in times of higher contingency."[128] Dibb was thus presented with a Navy view that appeared to equate the DDGs and FFGs and, by implication, render them interchangeable in their operational applications.

To RAN practitioners however, the capabilities of the DDGs and FFGs were not seen as equivalent. Commander Donald Chalmers had commanded *Perth* in 1982 and was subsequently told by CNS Hudson that he would not be returning to sea to command an FFG, because after commanding a DDG "…it would be a doddle."[129] It could be inferred that by then Hudson had come to the view that an FFG was not as capable as a DDG and therefore not equivalent. Regardless, the Tiered organisational structure went unchanged and it serves to emphasise how complex issues of a professional naval nature must be carefully explained to others so as to avoid misunderstanding.

Purpose built ships, such as minesweepers, are typically utilised for a specialised naval role and have limited broader utility. In contrast, destroyers and frigates are multi-purpose surface combatants with a much broader scope of operational application, and any differences in capability as between one class of destroyer or frigate and another are typically a matter of degree.[130] But the difference of degree can amount to one of substance, and this can have implications for operational suitability for some tasks, such as command and control as was the case with the DDGs and FFGs. For the RAN, having effective afloat command and control

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126 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1)*, page 12

127 ibid. Hudson's report was written after the Gulf War of 1990/91 – to which his remarks are directed.

128 ibid

129 Interview with Vice Admiral Donald Chalmers, 8 February 2013. Page 43

130 Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2010*, pages 138-139

capabilities would become more, and not less necessary as future maritime warfare became increasingly complex, joint and international in nature post-1987.[131]

Dibb's Review carried considerable implications for the RAN and the ADF more generally. Although Joint Service doctrine was available, it was deficient in terms of providing a conceptual explanation of naval operations.[132] The use of Tiers was intended to explain how and why different types of warships had differing levels of capability. But as we shall see, the RAN's attempt to simplify the complexities of naval force structure contributed unintentionally to its later problems in explaining why the capabilities of the DDGs were still required after their retirement from service, and why those of the FFGs were insufficient.

CNS Hudson had taken a close interest in the Dibb Review and he later remarked that he thought the strong emphasis by Dibb on maritime forces was appropriate, as was having a self-reliant military capability. Notwithstanding, Hudson considered that Dibb had underestimated the flexibility of surface combatants, while over emphasising the capabilities of submarines and aircraft in maritime strike operations.[133]

White Paper 1987 - The Defence of Australia

Informed by the Dibb Review, *The Defence of Australia 1987* was presented to Parliament by the Minister for Defence, Kim Beazley, in March 1987. It noted that the foreshadowed program was "…the largest defence capital investment in Australia's peacetime history. Over 33 per cent of the defence budget is now devoted to long term investment—a major increase since the early 1980s. This share will continue to be high throughout the decade."[134] In a continuation of the 1972 theme that the defence of Australia was not limited only to that of the continent, the White Paper noted that self-reliance in the Defence of Australia depended on preventing "…an aggressor attacking us successfully in our sea and air approaches, gaining a foothold on any part of our territory, or extracting concessions from Australia through the use

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131 For examples see: Gary Weir and Sandra Doyle, eds., *You Cannot Surge Trust - Combined Naval Operations of the Royal Australian Navy, Canadian Navy, Royal Navy and United States Navy, 1991 - 2003* Washington DC: US Naval History and Heritage Command, 2013.

132 A brief overarching ADF concept of its way of fighting was not published until 2002. Department of Defence (Australia), *The Australian Approach to Warfare* Canberra: Department of Defence, 2002a

133 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1)*, page 5

134 Commonwealth of Australia, *The Defence of Australia, 1987* Canberra: Australian Government Publishing Service, 1987, Preface

or threat of military force. This wider concept of self-reliance rejects the narrow concept of 'continental' defence. The strategy on which self-reliance is based establishes an extensive zone of direct military interest."[135] *The Defence of Australia 1987* rejected the lesser number of surface combatants proposed by Dibb, and stated that "The Government will expand the Navy to a force operating 16 to 17 major surface combatants."[136]

The 1987 White Paper incorporated the new RAN Tiered Surface Combatant concept in terms of three "broad levels of capability."[137] It noted that the DDGs were to be progressively modernised, with the last to be completed by 1990 and to remain in service for at least 10 years afterwards, and that the FFGs were expected to be in service for 30 years.[138] The White Paper also interpreted the second level as one that "…comprises ships of lesser capability, suitable for dealing with lesser forms of military pressure which could arise in Australia's resource zones and proximate waters or in Australia's area of direct military interest."[139] The Paper incorporated the proposal to create a new class of eight ships of the second level (equating to the Second Tier) to be constructed in Australia. They were to be designed so that "…their sensors and weapons can be enhanced to enable them to contribute to operations in more substantial contingencies and to complement the first level of capability in operations in the direct defence of Australia.[140] This was the genesis of the future Anzac Frigate program, but the phrase 'can be enhanced' was interpreted as involving the 'fitted-for-but-not-with' policy in vogue at the time, which meant that ships were not equipped for a full range of operations at the time of their entry into service. The concept of core force planning depended upon warning time for expansion, and such time would be used to fit ships with the capabilities needed for operations. As will be seen, the deployment of *Brisbane* to the first Gulf War had to overcome such a problem. CNS Hudson remarked that Navy "… found itself in the unsatisfactory position of having to argue for a sonar and ASW weapons to be fitted to the

135 ibid
136 ibid page 43
137 ibid page 44
138 ibid
139 ibid
140 ibid

Anzac class Frigate."[141] The policy of being 'fitted-for-but-not-with' was formally revoked 10 years later in *Australian Strategic Policy (1997).*[142]

The linkage of FFGs and DDGs at a force structure policy level, although appreciated in practice by Chalmers and possibly Hudson as being inaccurate, had later implications. As will be shown, by the year 2000 that linkage had allowed the as yet unmodified FFGs to be implicitly presented publically as (when modified) providing the capability represented by the DDGs.[143] In his end of career report and reflecting his experience, Hudson noted that he was "…mindful that naval strategic considerations and operations are the most complex and subtle of any military discipline and not generally understood."[144] By 1987, the prospective demise of the DDGs in the late 1990s had become obvious at the highest levels of Defence, and planning had been identified as necessary in advance, reflecting that effective planning would be both complex and time consuming. Effective and timely planning, however, did not materialise.

Australia's Strategic Planning in the 1990s

Although not made publically available until 1992, *Australia's Strategic Planning in the 1990s* (ASP 90) described its purpose as being a key government planning document. It had been endorsed in a classified form by Cabinet in 1989, and with the 1987 White Paper it provided continuing guidance for the development of Australia's defence.[145] The document stated there was no reason to change the fundamental approach to defence set out in the 1987 White Paper.[146] In regard to the priority for major naval capabilities needed from the mid-1980s to the mid-late 1990s, it argued that by the later period there would be three guided missile destroyers (all modernised), six guided missile frigates, and eight Anzac frigates (entering service from the mid-1990s).[147] In amplification, ASP 90 noted:

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141 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1)*, page 11

142 Commonwealth of Australia, *Australia's Strategic Policy* Canberra: Defence Publishing and Visual Communications, 1997a, pages 39-40

143 Commonwealth of Australia, *Defence 2000: Our Future Defence Force* Canberra: Defence Publishing Service, 2000, pages 89-90.

144 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1)*, page 4

145 Commonwealth of Australia, *Australia's Strategic Planning in the 1990s* Canberra: Departmental Publications 113/92, September 1992, page iii

146 ibid

147 ibid page 30

> "It is important to ensure that our major surface combatants and aircraft operating together maintain a margin of superiority for defence against air, surface or subsurface attack. Close to Australia, where it is easier for the ADF to achieve and maintain control of the air, there will be a trade-off between the number of ships available for operations and their air defence capabilities. Priority should be given to the former."[148]

The reasoning as to why priority should be given to the number of ships rather than to their air defence capabilities appears to be based on the premise of naval forces being given high priority for protection by land based aircraft. Earlier policies assumed that there would be sufficient warning time to allow preparation and fitting of important capabilities, and that while foreign military capabilities might exist elsewhere, the intention to apply their force would emerge in sufficient time to enable adequate responses to be formulated. Such a prognosis might be considered valid for a major conflict, but equally might not be effective if warning time was not heeded, and certainly not so readily for a crisis or event resulting from short term misunderstanding whereby a minor clash could take place.[149]

ASP 90 addressed the warning time philosophy and argued that an expectation of lengthy preparation time was no longer credible as the basis for an adequate strategy. There was now some likelihood of a 'come-as-you-are' conflict for which a 'fitted-for-but-not-with' capability would not suffice. The paper noted that "The capability principles and priorities outlined in this Chapter place a clear emphasis on the ability of the ADF to meet current and foreseeable tasks from within the force-in-being, which consists of both Regular and Reserve forces."[150] This issue was eclipsed by the advent of the first Gulf War of 1990/91. The war was a UN-sanctioned and United States-led operation, and the ADF participated for the first time since Vietnam in a major allied and coalition operation. Hudson remarked "Despite the postulations of some defence planners, the Gulf Crisis showed once again that warning time for such events can be extremely short."[151] Hudson also noted that the FFGs assigned to the RAN's first task

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148 ibid page 31

149 Lieutenant Commander Max Speedy RAN asserted that the warning time for smaller conflicts after WWII averaged 14.3 months See: I. M. Speedy, "The Trident of Neptune," *Journal of the Australian Naval Institute,* 3, 6, 1977, 10-20

150 Commonwealth of Australia, *Australia's Strategic Planning in the 1990s*, page 39

151 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1)*, page 12

group had only days to fit improved weapons before they departed Australia for operations,[152] underscoring the value of having capable forces not needing major upgrades before they can be used.

Australia's primary operational contribution to the first Gulf War was made by the RAN. It deployed three FFGs and a DDG, support ships and a diving team – all of which integrated effectively with the USN-commanded coalition naval force. Elements of the RAAF acted in supporting roles but no combat aircraft were deployed.[153] Commodore Robert Walls was a member of the ADF delegation associated with determining Australia's contribution to that conflict. He observes that anti-ship missile defence was of serious concern and suggested that "…CIWS[154] be provided to the *Brisbane*. I thought *Brisbane* was a good ship to send…because of its interoperability and its direct relationship with what the Americans had."[155] When asked if other ships such as *Swan* or *Torrens* were considered, his response was "Oh god no. Couldn't support them, didn't have the legs, didn't have the capability, probably couldn't defend themselves. *Brisbane* was marginal depending on whose threat projections you looked at."[156] *Brisbane* had completed its second major modernisation in late 1988,[157] which had been intended to ensure its operational capabilities were maintained until its decommissioning later in the next decade.[158] Interpreting Walls' remarks, *Brisbane's* modernisation still left deficiencies against an advanced air threat it faced only two years later, and is further examined in Chapter 4.

Captain Christopher Ritchie commanded *Brisbane* during the Gulf War conflict and remarks that the ship commenced being modified to meet new operational requirements for deployment soon after the first naval task group departed Australia. This included fitting of upgraded satellite communications, replacing the ship's boats, and fitting of the CIWS, electro-

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152 ibid

153 Peter Jones. "1991-2001: A Period of Change and Uncertainty." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001. 239-268. Pages 261-267

154 CIWS – abbreviation for Close In Weapon System – an automatic gun system sometimes referred to as Phalanx

155 Interview with Vice Admiral Robert Walls, 6 October 2011. Page 31

156 ibid. Walls had commanded *Brisbane* after its second modernisation and knew its capabilities very well.

157 "Standard High for Brisbane," *Royal Australian Navy News,* 11 November 1988, Vol31 No20, Page 2

158 Royal Australian Navy, *Project 1230 - DDG Modernization (Equipment Acquisition Strategy). Dated 19 February 1988. (SPC.DS.63.1),* Navy File 91-28893 Pt 1 Canberra: Sea Power Centre Australia.

optic and infra-red surveillance equipment, radar absorbent panels, and slotted pipes to the ship's side that enabled running of salt water over them to reduce the ship's thermal signature. Many of the initiatives were the work of Fleet Staff, but also of Commodore Chalmers who commanded the first task group and provided advice to the Fleet Commander in Sydney as to what would be required in the Persian Gulf area of operations.[159] The rapidity with which the ships could be deployed was a consequence of the RAN DDGs and FFGs benefitting from the USN practice of largely being fitted 'for-and-with', but they still needed enhancements to meet the advanced operational conditions they were to confront. Unlike in Vietnam, the Ikara missiles remained embarked in *Brisbane* throughout.[160]

Commander Antony Anderson was the Project Director for the DDG Modernisation Project when the requirement was initiated to prepare *Brisbane* for Gulf War service. He remarks "… we put that on in 6 weeks (CIWS) and it sailed 2 hours late…it was a great experience…the dockyard…was working 24 hours a day...we did it with very very little American support…and it never arrived in time…the Americans were quite amazed that we achieved that in the time we did…"[161] Having an Australian naval industrial infrastructure sufficiently capable of supporting the DDGs was shown to be essential in ensuring a national capability to prepare the Navy for combat operations.

In terms of lessons from the conflict, Vice Admiral Ritchie remarks that the RAN realised that its professional standards had declined, and that it took some time to reach the level they should have been at to cope with modern naval warfare. Fortunately, the RAN had the services of former RN officers who had gained combat experience during the Falklands War and were able to pass on their knowledge to the RAN. Ritchie reflects that after the Gulf War, the RAN began to apply higher standards of professional performance for all of its units.[162]

Lieutenant Commander Richard Menhinick was able to compare the performance of the combat systems of the RAN DDGs and FFGs during the first Gulf War. He is of the opinion that the AN/SPS-49 radar fitted to the FFG was markedly inferior to the AN/SPS-52 radar fitted to the DDG, and that the FFGs suffered through the lack of an effective automated radar tracking capability of the same quality as that of the DDGs by virtue of the latest AN/SYS-1 radar

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159 Interview with Vice Admiral Christopher Ritchie, 30 January 2013. Page 50
160 ibid page 51
161 Interview with Commander Antony Anderson, 24 August 2012. Page 37
162 Interview with Vice Admiral Christopher Ritchie. Page 59

processing system.[163] Menhinick comments that in his later role as the Fleet Direction Officer he observed closely the performance of FFGs and, prior to their subsequent modernisation, he felt that the FFGs were much inferior to the DDGs as higher level warships.[164]

Ritchie notes that Australia's core-force defence policies of 1990-91, reflected in the capabilities of the Anzac frigates, did not enable the ships of the RAN to be ready for the kind of conflicts in which the Government decided to use them in. Its key assumption, and weakness, was that there would be an extended period of time available to ready the force in both numbers and capability.[165] The core-force policy was rescinded in the later *Strategic Policy 1997* when, in a direct reference to how the RAN had responded to the 1990-91 Gulf War, it said "Past experience has shown that a policy of "fitting for but not with" a particular capability - in the expectation that there would be time in which to acquire, fit and develop proficiency in the use of a particular capability - as a flawed concept."[166] Being 'fitted-for-and-with' however, removed some fiscal options previously utilised by Defence for reducing the cost of acquisition of some expensive platforms through limiting their initial levels of capability. Having been acquired from the USN, the DDGs and FFGs had been fitted to the level of capability set by the USN, which did not adopt either the 'core force' or 'fitted-for-but-not-with' practice. The RAN, and Australia, became direct beneficiaries of the sourcing of its higher capability surface combatants from its major ally because when needed to meet government policy they could deploy at short notice and already be of a requisite capability.

Ritchie was CN in 2003 when the second Gulf War commenced, and remarks "… if the scenario that had applied the second time round had been the same as the first time around, I wouldn't have sent any ships…Because they were not capable of dealing with the air threat."[167] Ritchie's remarks reflect how there had in fact been a reduction in the RAN's operational capabilities since the first Gulf War relative to the evolution of the air threat. Although they

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163 Interview with Commodore Richard Menhinick, 12 July 2012. Page 19

164 ibid pages 28 and 33

165 Interview with Vice Admiral Christopher Ritchie. Page 64. The core-force policy was complemented by the 'fitted-for-but-not-with' approach as has been commented upon by Hudson in regard to fitting the Anzac frigates without a sonar system. See: Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1)*, page 11. Woolner examined the core-force implications for the FFGs. See: Derek Woolner, "The Purchase of the American FFG-7 Frigate in the Context of Future Equipment Policy for the Royal Australian Navy," *Journal of the Australian Naval Institute,* 3, 3, August 1977, 17-37

166 Commonwealth of Australia, *Australia's Strategic Policy*, pages 39-40

167 Interview with Vice Admiral Christopher Ritchie. Page 64

were then out of service by only two years, the second modernisation program for the DDGs commencing in 1985 had not brought their combat systems up to the standard required for such a scenario. The only options available for the RAN to offer government in 2003 were its unmodified FFGs and its less capable Anzac frigates. Although the scenario was less demanding in an air threat sense, had it not been so benign and had the Government decided so, Ritchie would have had no choice but deploy ships and deal with the risk. But it is evident that naval policy options previously available to government through having capable DDGs had been steadily declining since the first Gulf War of 1991, and possibly earlier.

Force Structure Review - 1991

Development of the *Force Structure Review* of 1991 (FSR-91) began in the Department of Defence in May 1990 following its commissioning by the Minister for Defence, Robert Ray. It took the form of a report to the Minister with recommendations to ensure ADF force structure planning in the 1990s proceeded in a balanced way; it was signed by General Peter Gration, the Chief of the Defence Force, and Mr Anthony (Tony) Ayers, the Secretary of the Department of Defence.[168] The Review proposed a long term restructuring program to maintain the momentum of the 1987 White Paper.[169] The aging of some capabilities was recognised, of which the DDGs were but one, and it was noted that "This will allow new investment proposals to be developed in the second half of the decade…from the first decade of next century there will be heavy demands to replace obsolete equipment…the scope for new initiatives lies mainly in this decade."[170]

FSR-91 noted that the number of surface combatants needed by the RAN depended on the nature of the tasks involved and the tactical environments they faced. It postulated that eight ships would be needed to patrol the approaches to Australia between Derby and Torres Strait, two more for other patrolling requirements, and overall "…a force of 16 surface combatants, with afloat support, would be required to maintain ten on station."[171] FSR-91 considered protection of offshore resource platforms and convoy operations and summarised

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168 Covering letter to Minister dated 15 May 1991. Department of Defence (Australia), *Force Structure Review* Canberra: Australian Government Publishing Services, May 1991

169 ibid

170 ibid

171 Department of Defence (Australia), *Force Structure Review* Canberra: Australian Government Publishing Services, May 1991 page 15

requirements thus "…16 of the 28 surface combatants should be destroyers or frigates."[172] The intended replacement for the 15 Fremantle patrol boats, regarded by the RAN as Tier three surface combatants, was to be an offshore patrol vessel with first delivery in 2004, requiring the Fremantles to have their lives extended by a further seven years.[173]

The Review also noted that the last DDG was expected to pay off in 2001, a decade hence, leaving the number of combatants in service at that time as 11, but the number would rise to 14 with the introduction of the Anzac frigates. Without a continuing ship building program, from 2008 the number of surface combatants would start to fall again as the first FFG reached the end of its life.[174] In an attempt to achieve standardisation of the RAN surface combatant force, FSR-91 stated "Planning to replace the DDGs will proceed on the basis of an ANZAC derivative."[175] The argument was made that:

> "This would also maintain the continuity of Australian shipbuilding, to achieve commonality, to facilitate through life support and training, and to build the number up to 16. ANZAC derivatives could also replace the first four FFGs…The ANZAC derivative can utilise the basic ANZAC design concept, but allow for improved capability and future technological developments."[176]

The term 'derivative' is open to interpretation, but it is possible to infer that it would draw significantly upon the same Anzac design so as to provide for the desired commonality benefits, and be of approximately similar dimensions to avoid wholesale redesign of the ship. With the project starting in 1997, allowing for first delivery of an Anzac derivative in about 2006, it was already inevitable that there would be a five year gap between losing the last DDG and arrival of the first Anzac derivative.[177] The Review also announced that expensive mid-life modernisations and life extensions of the destroyer force would be discontinued. Instead, more modest capability enhancements would be undertaken during a ship's normal maintenance cycle.[178]

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172 ibid
173 ibid page 16
174 ibid page 15
175 ibid page 16
176 ibid
177 ibid
178 ibid

At this point, planning for the surface combatant force structure had incurred some discontinuities, but measures to mitigate risks had also been identified. It was not explained in FSR-91 how a derivative of the 3,600 tonne ship[179] Anzac class, originally designed to satisfy second Tier capabilities, could become a replacement for the 4,500 ton first Tier DDGs and FFGs. A three-phase project referred to as SEA 1443 was later established to manage what became known as the ANZAC Warfighting Improvement Program (ANZAC WIP).[180] This was an ambitious project intended to convert as many of the Anzacs as was affordable and provide advanced air warfare capabilities. This included installation of SM-2 accompanied by an additional missile vertical launch capacity, and a scaled down phased array radar similar to that used by the USN Aegis system. Alternative configurations were developed by companies competing for the project and contract award was expected in June 2001.[181] Friedman points out that since 1945, warship designs had been heavily influenced by the increased volume required to accommodate modern electronics.[182] The consequence being, in his opinion, that warships of about 8,000 to 12,000 tons were necessary to accommodate the equipment associated with a modern multi-role surface combatant.[183] Allowing that Friedman's estimate of size was possibly generous, on such a basis the Anzac derivative would still require a considerable increase in volume and therefore significant change to the basic Anzac design to house the necessary electronics and weapons. Such a scale of change and development would likely introduce high risks to technical achievement as well as cost and schedule. Ultimately, and as we shall see, the Anzac derivative did not materialise for those reasons, and an operational penalty was incurred.

Strategic Review - 1993

The *Strategic Review 1993* followed on from FSR-91 and acted as the precursor to the Defence White Paper of 1994. The 1993 Review was approved by the Minister for Defence, Robert Ray, and proffered that it was to be part of a continuous cycle of defence planning to adapt

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179 The tonnage of an Anzac frigate at delivery and before the ASMD Upgrade Program, at which time it became 3,759 tonnes. See: "HMAS Perth III," http://www.navy.gov.au/hmas-perth-iii

180 Janes Navy International, "ANZAC WIP has Two-Way Split," *Janes Navy International,* 1 October 1998, 1-2

181 ibid

182 Norman Friedman, *Modern Warship Design and Development*, First American ed. New York: Mayflower Books, 1979. Page 11

183 Norman Friedman, *New Technology and Medium Navies* Jervis Bay, N.S.W.: RAN Maritime Studies Program, 1999. Page 39

Australia's strategic policies to its emerging challenges.[184] The Review noted that "In our defence planning, priority will be given to developing the capabilities to respond to threats that could arise with little warning…"[185] Continuing a theme of FSR-91, the Review warned of a need to avoid a deterioration in capability and highlighted that investment would need to be maintained if "…block obsolescence in the first decade of the next century is to be avoided, and the regional standing of our capability levels retained."[186] The 1993 Review recognised that more capable surface combatants and fighter aircraft were entering Australia's region and that it was important for the ADF to have technical advantages. In relation to resource concerns about maritime capabilities, the Review also noted that trade-offs would often be required over the number of platforms and the types of expensive weapon systems they would carry.[187]

FSR-91 had acknowledged that a naval air defence capability gap would arise in the first decade of the following century caused by losing the DDGs, but no solution was provided. The inference must therefore be that the risk was acceptable. In contrast, by 1976 the USN had decided that a new class of destroyers was needed to meet an emerging air threat and that the planned upgrade for all of its DDG-2 class would not cost effectively meet its operational requirements.[188] By 1989 the USN had signalled the early retirement of all its DDGs from service[189] which was accomplished by April 1993 with the departure of USS *Goldsborough*.[190] The relevance of the DDGs to Australia's defence policy at the time of the 1993 Review appeared to be a matter of high importance to the RAN, but not to those responsible for the force structure planning of the ADF as a whole, or to the Minister for Defence. The possibility that an Anzac derivative would meet the RAN's future need may have given comfort to

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184 Commonwealth of Australia, *Strategic Review 1993* Canberra: Australian Government Publishing Service, December 1993. Page 39

185 ibid page 43

186 ibid page 47

187 ibid page 62

188 Janes International Defense Review, "Todays "Revolution at Sea" the Arleigh Burke (DDG 51) Aegis," *Janes International Defense Review,* 1 March 1989, 1-6

189 Janes Defence Weekly, "US Navy Chief Fears Shortfall After Budget," *Jane's Defense Weekly,* 3 June 1989, 1

190 "USS Goldsborough (DDG-20)," NavSource Naval History, http://www.navsource.org/archives/05/01020.htm. *Goldsborough* was purchased by Australia in May 1993 so that the RAN could undertake weapons electrical technical training of its DDG personnel then no longer available through the USN. See: "Surplus USN DDG for RAN," *Royal Australian Navy News,* 7 May 1993, Vol36 No8, Page 3

planners, but a consideration of international trends, particularly the evolution of USN destroyers, should have raised questions about the veracity of that concept and its assumptions. The impact of the DDGs on the outlook of those who developed Australia's defence policy between 1986 and 1993 could accordingly be interpreted as marginal. But in terms of operational impact on the RAN, this lack of effective force structure planning was to prove highly significant in 1999 when the RAN was required to depend upon RN and USN air defence capabilities in East Timor operations.

White Paper 1994 - Defending Australia

Defending Australia was presented as the Defence White Paper 1994 by the Minister for Defence, Robert Ray, in November 1994. It described how it built on a range of documents intended to ensure that Australia's defence planning remained relevant to its circumstances. The Paper referred to the *Force Structure Review* of 1991 and *Strategic Review* of 1993 and noted that "Our strategic circumstances at present are not threatening, but they are likely to become more demanding over the next fifteen years."[191] In continuing a theme of self-reliance, the document noted that Australia's highest priority was to build the appropriate forces necessary for the defence of Australia against any threat that could be credibly mounted against it.[192]

The paper reiterated how Australia should have forces capable of defending it from those countries that could mount an attack against it.[193] In practice, such countries would be of considerable military power, and would therefore take a very large and capable ADF to defeat. Such a criterion implied that Russia and China were Australia's primary potential adversaries by virtue of their political characteristics and the size and capabilities of their armed forces. At that time, with the Cold War having ended, neither country was a credible or major threat in the foreseeable future. To make that issue the primary determinant of Australia's force structure decisions may have reflected a long term view, potentially incorporating aspects of Australia's commitment to ANZUS, but it could only be regarded as aspirational unless it were to be accompanied by the resources necessary to achieve the outcome required. As the most capable ships of the RAN, the replacement of the DDGs and the capability they represented

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191 Commonwealth of Australia, *Defending Australia (Defence White Paper 1994)* Canberra: Australian Government Publishing Service, November 1994, page iii

192 ibid page 14

193 ibid

might therefore have been regarded as important. *Defending Australia* also recognised that "An ADF structured primarily for the defence of Australia will possess significant capabilities which can be used flexibly in a wide range of activities."[194] The DDGs had proven themselves on multiple occasions to be utilitarian in these terms and some justification therefore existed for a continuation of their capability.

The 1994 White Paper again noted the impact of geography on Australia's defence strategy: "As an island continent, the primary focus of our defence effort is on our sea and air approaches, which can be turned to our decisive advantage."[195] The document noted that Australia's most important challenge was to adapt to the implications of the increasing quality of regional military capabilities, especially those of naval and air forces, and that while conflict was not expected, the introduction of such capabilities increased the potential for short-warning contingencies.[196] Without using the word 'obsolescence', attention was drawn again to the need to preserve the defence capital investment program so that platforms remained effective.[197] In considering 'Maritime Operations', the document noted that the Government would continue to invest in maritime forces, and that new naval platforms such as the Anzac frigate would be equipped with the appropriate sensors and weapons, as well as helicopters.[198]

The intention by Defence to discontinue expensive half-life modernisations and life extension programs of major warships adopted by FSR-91 three years previously was overturned. The document announced that "Australia's six guided-missile Frigates (FFGs) will be upgraded to extend their operational life and ensure their survivability in the increasingly sophisticated maritime warfare environment."[199] Surface combatants were no longer allocated into Tiers as had been done since 1987, and the 1994 Paper noted "The introduction into service over the next ten years of eight ANZAC Frigates will significantly enhance our surface combatant fleet, improving our capacity for maritime patrol and response and protection of shipping. The first of the ANZAC Frigates was launched in Melbourne in September 1994 and the last will be

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194 ibid page 33
195 ibid page 21
196 ibid pages 24 & 25
197 ibid age 35
198 ibid page 43
199 ibid. Aspects of the FFG Upgrade Project are discussed later in this Chapter.

launched by 2002."[200] In the event, the final Anzac Frigate (*Perth* III) was launched in March 2004, two years later than originally planned.[201]

Although FSR-91 had proposed that the replacement for the DDGs would be a derivative of the Anzac Frigate, the 1994 Paper announced that "Planning has begun to identify the required surface combatant force capabilities after the three guided-missile destroyers (DDGs) leave service, currently planned from about 2000."[202] As an indication that uncertainty existed about what was required however, the paper later remarked "Consideration will be given to replacement early next century of the capability provided by the DDGs."[203] Such a weak statement could not be interpreted as confidence that the capabilities of the DDGs were highly regarded. Instead, it might imply that when delivered, the modernised FFGs would prove to be an adequate replacement, and that the suitability of adopting an Anzac derivative as a replacement for the DDGs was as yet unproven. As in 1991, in 1994 it was clear that the capability represented by the DDGs would go out of service in 2001 without a specified replacement. From 1991, when a five-year gap was acceptable to introduce an Anzac derivative as the DDG replacement, the priority had drifted to the position in 1994 where the capability would be considered early in the next century. In capability planning terms this was a much more ambiguous and open ended situation. In fiscal planning terms, it inserted replacement of the DDGs amidst other high cost defence projects, all of which would be competing for budgetary approval against the remainder of the Government's agenda. Collectively the pronouncements were ones of equivocation as to the capabilities Australia's Government really required of its Navy, and show that the incoherent force structure planning highlighted by Dibb in 1986 was still present.

The FFG Upgrade was undertaken through Defence Project SEA 1390.[204] A two year project definition study was contracted in 1994 for $13.5 million when the upgrade program was started, and a contract was awarded in June 1999 for $1.266 billion to upgrade six ships. The White Paper of 1994 had required all six FFGs to be modified but a subsequent decision by government in 2003 reduced the number to be modernised to four while approving the

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200 ibid page 43
201 http://www.navy.gov.au/hmas-perth-iii
202 Commonwealth of Australia, *Defending Australia (Defence White Paper 1994)*, page 43
203 ibid page 155
204 Lee Cordner, "The most Capable Warships in the Navy's History Set to Join the Fleet," *Headmark (Journal of the Australian Naval Institute),* 130, 2008, 4-14

installation of SM-2 in those ships.[205] In contradiction of earlier government pronouncements about the importance of having greater numbers of surface combatants, their numbers instead were shrinking. The project took more than 15 years to progress from starting to the four ships being fully operational in 2009,[206] being four years late in delivery. The policy judgements expressed in FSR-91 concerning the inadequacy of ship life extension projects were proven correct in the main.[207] The FFG Upgrade was a protracted and complex exercise resulting in the extended operational unavailability of the ships while in the program.[208] In turn this placed pressure on the maintenance cycle of other ships owing to the Navy having to keep its fewer ships at higher levels of utilisation to meet operational commitments.[209]

Drawing on that experience, in 2002 the Department of Defence released a draft strategic plan intended to shape Australia's naval shipbuilding and repair capabilities and provide more efficient and effective industrial support to the RAN.[210] The plan was an initiative to manage proactively the supply of and demand for ships and avoid life extension programs. The plan noted "…a significant period of compromised capability exists in the final ten years or so of the vessel's life. This may be significant if a heightened threat environment should also eventuate in this period."[211] Modernisation of the DDGs was cited as an example of considerable expense incurred in relation to the capability achieved, and it was stated that their earlier replacement might have provided a more cost effective capability solution.[212] The proposed

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205 The Auditor-General, *Management of the FFG Capability Upgrade (Department of Defence - Defence Materiel Organisation)* Canberra: Australian National Audit Office, 2007. Page 11

206 Lee Cordner, *The most Capable Warships in the Navy's History Set to Join the Fleet*, 4-14.

207 Department of Defence (Australia), *Force Structure Review*, page 16

208 The Auditor-General, *Management of the FFG Capability Upgrade (Department of Defence - Defence Materiel Organisation)*, page 21

209 For a description of how the RAN manages sustainment and readiness of its ships see: P. Rizzo, *Plan to Reform Support Ship Repair and Management Practices* Canberra: Department of Defence, 2011, pages 21-22

210 Department of Defence (Australia), *The Australian Naval Shipbuilding and Repair Sector Strategic Plan*, 2002.

211 ibid page 174

212 ibid page 33. Modernisation of the River class was also cited as not being cost-effective.

plan was subjected to considerable public criticism, which included concern about the potential industrial outcomes, and it was eventually not approved by the Government.[213]

Australia's Strategic Policy - 1997

Australia's Strategic Policy was delivered by the Minister for Defence, Ian McLachlan in December 1997.[214] The policy had been developed consequent to consideration of the 'Future Directions for the Management of Australia's Defence' (the Defence Efficiency Review) finalised in March 1997.[215] The Efficiency Review and its subsequent Reform Program were commented on by the departing CN, Vice Admiral Rodney Taylor, in his 1997 Haul Down report. He noted that resources for the Navy had been constrained since 1994 and that there had "… been a constant search for improved efficiency." [216] In a sign of his dissatisfaction with the outcomes and process adopted, Taylor also commented:

> "With the Defence Budget now at 1.9 percent of GDP (the lowest level during my 43 years of Naval service), the Defence Efficiency Review and Defence Reform Program have been directed at the identification of further administrative savings to allow more resources to be applied in combat areas. I have reported elsewhere on the conduct of the Defence Efficiency Review, which I simply describe here as the most unpleasant and professionally disappointing experience of my tenure."[217]

Australia's Strategic Policy of 1997 was not technically a White Paper. But the Minister's opening remarks said that this was the first comprehensive review of Defence by the Coalition Government since 1979, and that the combination of efficiencies to be reaped from

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213 The proposal by Defence was interpreted as leading to shipyard rationalisation and creation of an Australian warship building monopoly. See: Mark Thompson, *Setting a Course for Australia's Naval Shipbuilding and Repair Industry* Canberra: Australian Strategic Policy Institute, 2002. On 18 April 2016 the Government announced its adoption of a continuous naval shipbuilding policy, a method proposed in the Defence study of 2000 to more effectively manage supply and demand as well as other industrial considerations. See: https://www.minister.defence.gov.au/minister/marise-payne/media-releases/prime-minister-and-minister-defence-continuous-naval

214 Commonwealth of Australia, *Australia's Strategic Policy*, page iii

215 Department of Defence (Australia), *Future Directions for the Management of Australia's Defence - Report of the Defence Efficiency Review* Canberra, A.C.T: Directorate of Publishing and Visual Communications, 1997

216 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff & Chief of Navy: Vice Admiral R.G. Taylor RAN. Dated 30 June 1997. (SPC.DS.39.1),* Canberra: Sea Power Centre Australia. Page 3

217 ibid pages 3 and 4

implementing the reform program and changes to be delivered through the revised strategic policy would provide a "…blueprint for taking Australia's defence into the 21st century."[218] The policy once again recognised the strategic influence of Australia's geography such that it would "… plan on operations which concentrate on defeating any aggressors in our maritime approaches, before they reach our territory." It went on to say that "If Australia maintains the capability to deny our air and sea approaches to hostile ships and aircraft, then we can prevent hostile forces reaching our territory or operating on it for long."[219] Although land forces were described as being important for increasing the risk to a potential aggressor in holding ground in Australia, the policy highlighted that "…combat aircraft, submarines and surface combatants, supported by well-developed intelligence, surveillance and command and control systems, would be our first line of defence and are our highest priority."[220] In Parliament, McLachlan intimated that the Government also recognised the need to be able to respond to a wide range of challenges when he remarked:

> "…while the core of our planning will be on the capabilities needed to defeat attacks on Australia, we will choose capabilities suited to a wider range of tasks. Our aim is to promote a secure country in a secure region. We will not deploy forces ill-equipped for the task. We want to avoid last minute scrambles to bring our forces up to scratch."[221]

In recognition of the reliance on airpower as the central plank in the defence of Australia strategy, McLachlan went on to say that "Air superiority is a decisive capability. Australia faces a difficult set of choices over the next decade about our future fighter aircraft capabilities."[222] The key role of the DDGs in maritime air warfare went unremarked. After announcing that the highest priority would be achieving the 'Knowledge Edge', the second highest priority was given as 'Defeating Threats in our Maritime Approaches'. To achieve this strategic aim, air superiority was given the highest priority for further capability development and portrayed as the most effective way of defeating air threats, and attacking ships.[223] In regard to surface combatants, the Paper noted: "Within range of friendly air cover, surface ships remain a

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218 Commonwealth of Australia, *Australia's Strategic Policy*, page iv
219 ibid page 44
220 ibid page 45
221 Commonwealth of Australia. *CPD [Reps] Proof, 2 December 1997.* Page 11743
222 ibid
223 Commonwealth of Australia, *Australia's Strategic Policy*, pages 60 - 61

potent and flexible capability..."[224] The implied vulnerability but utility of ships in this operational environment was further acknowledged with: "Ships have a unique capacity to linger in an area of tension for substantial periods. They are therefore especially useful in periods of tension and transition to war."[225]

The role of the RAN appeared to be purely that of an enabling force, rather than one having major combat responsibilities for the defence of Australia. This was not unlike the views expressed by A.T. Griffiths in 1965[226] when evaluating the place of the DDGs in the broader RAN force structure. Providing for the primary defence of Australia through a force structure concentrating on airpower opened potential avenues for its exploitation by an adversary because it involved a lack of strategic balance, and this broke with a previous Australian approach of having such strength of quality in its strategy. The value of a balanced force is remarked upon by Colin Gray, whose premise is that balance gives greater prospect of dealing with the contingencies of an uncertain future.[227] Consideration of context is strategically essential and, as defenders of an island continent which regarded itself to be a medium power, neither the Australian Government nor its advisors should have discounted the importance of maritime security to the extent that they did. Gray has also argued, from analysis of major wars over a period of 2,500 years, that "…superior sea power generates a strategic leverage which enables wars to be won."[228] Australia's required ability to leverage its sea power at the expense of an adversary while resolving its broader defence circumstances did not appear to resonate with the Australian planners whose responsibility it was to hedge against such a circumstance.

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224 Ibid page 61

225 ibid page 61-62

226 Commonwealth of Australia, *Internal Minute to Secretary of Prime Minister's Department by A.T. Griffith regarding Haul Down Report of Vice Admiral Sir Hastings Harrington RAN. Dated 1 April 1965.* Page 2

227 Colin S. Gray, *Modern Strategy,* page 211

228 Colin S. Gray, *The Leverage of Sea Power : The Strategic Advantage of Navies in War* New York : Toronto : New York: New York : Free Press ; Toronto : Maxwell Macmillan Canada ; New York : Maxwell Macmillan International, 1992. Pages x & 289. Gray's treatise demonstrates the critical leverage bestowed by sea power in achieving success on land. He also stresses the mutually enabling interdependency of all of the Services in achieving military objectives.

McLachlan announced that the Offshore Patrol Vessel project that had commenced as a joint venture with Malaysia[229] would not proceed due to the contractor (Tenix) losing the bid, and that the RAN's Fremantle class patrol boats would again have their lives extended.[230] The policy outlined how, over the next decade or so: "We now have fourteen major ships in service or on order. We have no intention to invest in new major surface combatants to increase that number."[231] Instead there would be upgrades to the FFGs and Anzac frigates which would make them very capable.[232] There was no reference in the document to either the Anzac derivative, or of replacing the DDGs, despite their planned departure from service within four years.

Expressed differently, this situation can be understood as one in which those responsible for the development of strategic guidance and force structure planning had permitted two very expensive capability developments to coincide in Defence's financial program. They were the replacements of the RAN's DDGs, and RAAF's F/A18 aircraft. There were apparently no extenuating national security circumstances to justify such a fiscal impost for the Government, which had been placed in the suboptimal position of having to make a choice about two very important Australian capabilities. Government options were curtailed by Defence's failure to apply its own long established policies, such as expressed in FSR-91, that planning for such circumstances required care to obviate the problem which it had instead helped to create. While they were understandably reliant upon senior advisors, the situation implies that Ministers themselves had taken insufficient interest in the evolving force structure of the RAN, or of the ADF more generally.

McLachlan's remarks also included, however, a recognition that a capability for the RAN to operate without land based air cover had re-emerged as an operational consideration when he said that the ships (FFGs and Anzacs) being upgraded "…would provide us with a substantial fleet of very capable ships able to operate throughout our maritime approaches and beyond, under land-based air-cover where possible and with some capability to operate without air-cover, especially in task groups."[233] The recognition that naval task groups were likely to be

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229 Department of Defence (Australia), *Project Design of a Joint Patrol Vessel for Malaysia (Press Release by Defence Minister Robert Ray)* (Canberra: Department of Defence)
230 Commonwealth of Australia, *CPD [Reps] Proof, 2 December 1997*. Page 11743
231 Commonwealth of Australia, *Australia's Strategic Policy*, page 62
232 ibid
233 ibid

necessary was important to the future of RAN force structure planning in that, at a government level, it implied that afloat command and control at least was required. But another shift in thinking was also apparent when the possibility of land based air cover not being available was likewise recognised as a force structure planning determinant. How a naval air defence capability was to be provided in the short to medium term was less clear given the impending retirement of the DDGs, the lack of commencement of modernisation of the FFGs and Anzac*s*, and no new construction programs being initiated.

In preparing the final draft of *Strategic Policy 1997*, the Maritime Development Branch within the Department of Defence Capability Division undertook studies concerning the suitability of acquiring three of the USN's decommissioned Kidd class destroyers. The Kidd*s* were originally built by the US for the Shah of Iran but not delivered, but when modified and used by the USN were regarded as successful warships.[234] In 1992, the Kidds were described in *Janes* as "the most powerful destroyers in the fleet."[235] Commander Menhinick was a member of the study team and considers that their purchase would have been both practicable and sensible. The study showed RAN personnel could be provided to crew the three Kidds by immediately decommissioning the DDGs and two of the six FFGs. While not without risk, the Kidd program could have provided for introduction of modern ships fitted with SM-2 into the RAN by about the year 2000, at least seven years earlier than subsequently achieved by the upgraded FFGs.[236] The Kidd*s* would have delivered an interim continuation of the air warfare capability represented by the DDGs and avoided the RAN capability gap until new ships could be constructed and introduced, estimated then to be by about 2015.[237] Menhinick remarks that there was resistance to the proposal by senior Defence officials, and in a 1999 newspaper article the previous Minister, McLachlan, was reported to have "placed a blanket ban on US

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234 Malcolm Muir, *Black Shoes and Blue Water: Surface Warfare in the United States Navy, 1945-1975* Washington, D.C: Naval Historical Center, Dept. of the Navy, 1996, page 189.

235 Richard Sharpe, ed., *Jane's Fighting Ships 1992-93* Surrey UK: Janes information Group, 1992, page 752

236 The replacement of SM-1 by SM-2 in the FFGs received Government approval in 2004 and entered service after 2007. See: The Auditor-General, *Management of the FFG Capability Upgrade (Department of Defence - Defence Materiel Organisation)*, pages 38-39

237 Interview with Commodore Richard Menhinick. Page 31

warships after the RAN fared poorly in a deal with the US in 1994."[238] Vice Admiral Donald Chalmers, who in 1997 succeeded Taylor as CN, had the view that the Kidd class did not represent the solution that was needed at that time, but he did not elaborate.[239] At that time the Anzac Warfighting Improvement Program was still under departmental development and some confidence apparently remained that an Anzac derivative could fill the air warfare role to be vacated by the DDGs.

Australia's Strategic Policy 1997 had a considerable impact on the RAN in so far as not recognising, in a policy sense, how the capabilities represented by the DDGs were very important to it. In fact it was the opposite, and the DDGs and their capabilities had effectively been removed from consideration. In this context, their influence upon policies associated with national security strategy and naval force structure policy was negligible. A decision that no investment in new ships was warranted at that time overlooked the extended period of time it took for their acquisition. In practice this almost certainly meant that the lives of aging FFGs would again be extended through further investment to keep them operational, or through accepting risk until they were replaced if that were to be decided. This potentially would leave the RAN solely with its aging eight Anzac frigates and four very old FFGs; an order of battle well down on the 17 to 20 ships that Beazley had clearly considered necessary.

White Paper 2000 - Our Future Defence Force

The Defence White Paper of the year 2000 *Our Future Defence Force*[240] was the first policy statement since leaving Vietnam in 1972 wherein the Australian Government recognised that it was at a watershed in its strategic defence policy, and that a different direction was needed to remedy deficiencies that had become apparent during operations in East Timor in 1999, as will be shown.

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238 "Navy Told US Ships Too Risky," *Herald-Sun,* 5 November 1999. The Minister appears to have been referring to the Government acquisition of two LST ships (landing ships) from the USN which required significant modification to meet ADF requirements and had major maintenance problems for their remaining lives. After modification they were re-categorised as LPAs and re-named *Manoora* and *Kanimbla*. The costs of their modernisation rose from $70m to approximately $400m. See: Kathryn Spurling. "1991-2001: The Era of Defence Reform." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001. 269-294. Page 275

239 Interview with Vice Admiral Donald Chalmers. Page 39

240 Commonwealth of Australia, *Defence 2000: Our Future Defence Force*, page 3

The expectation that Australia would lead an international UN peacekeeping force in East Timor in 1999-2000 dealing with Indonesia and ensuring a smooth transition of power to a new Government did not feature in the earlier 1997 policy statement. Timor stood as a clear reminder of how quickly international circumstances could change, as had been the case when Australia found itself engaged in the first Gulf War of 1990-91. The Timor mission had been complex,[241] and lessons learned at both the political and military levels contributed to the development of a revised Defence policy. The remarks of Major-General Peter Cosgrove, the Australian and coalition East Timor force commander, in acknowledging the role of sea power during the UN operation known as INTERFET,[242] encapsulated his view of the value of naval capabilities:

> "Another blinding glimpse of the obvious…The persuasive, intimidatory or deterrent nature of major warships was not to me as the combined joint force commander an incidental, nice to have 'add on' but an important indicator of national and international resolve and most reassuring to all of us who relied on sea lifelines. It was a classic case of the 'presence' pillar of sea power."[243]

John Moore as the Minister for Defence acknowledged that government had concluded that, without greater expenditure on defence, the range of capabilities needed by the ADF could not be retained. The Government had to spend more on Defence, or expect less of what Defence could do.[244] The White Paper acknowledged the lessons of INTERFET and remarked that the Government had been concerned for some time "…that a mismatch had developed between our strategic objectives, our defence capabilities and our levels of defence funding."[245]

Although the US provided important assistance to the East Timor operation, it adopted a supporting posture which reflected its view that Australia had security obligations in its immediate region that should be met through its own efforts. Conflict with Indonesia did not emerge, but if it had done, the RAN would have had a very difficult time dealing with a capable

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241 David Stevens, *Strength through Diversity: The Combined Role in Operation Stabilise* Canberra: Sea Power Centre Australia, 2007. Page 3

242 INTERFET – abbreviation for International Force East Timor

243 Major-General (Later General, and subsequently Governor General of Australia) Peter Cosgrove quoted in: Kathryn Spurling. "1991-2001: The Era of Defence Reform." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001. 269-294. Page 293

244 Commonwealth of Australia, *Defence 2000: Our Future Defence Force*, page v

245 ibid page 6

land-based air threat in such close proximity to the coast. Two unmodified FFGs and one unmodified Anzac class frigate escorted Army forces to East Timor embarked in *Tobruk*, which accepted the operational risks notified to the CDF in 1997 by CN Taylor that the FFG air defence missile system was obsolescent and the Anzac frigates had only a self-defence capability.[246] The USN provided the USS *Mobile Bay*, an Aegis equipped Ticonderoga class cruiser[247] and the RN deployed the aging Type 42 destroyer HMS *Glasgow,* which had seen service in the Falklands conflict, with its Sea Dart missile system.[248]

Through its leadership of INTERFET, Australia had markedly shifted its defence strategy towards incorporating a partial expeditionary posture which, for an island nation meant that it needed a range of appropriate naval capabilities. As importantly, the premise that an ADF force structure suitable for Defence of Australia would also be capable of meeting its less demanding security interests such as INTERFET had required, was found to have had a number of weaknesses. These included the escort and protection of Australia's Army forces while in transit and during their disembarkation and lodgement in the new location, for which the DDGs when first acquired were well equipped. When they were needed in mid-1999, the DDGs were not available, and had they been, their capabilities were already obsolete.

After eight years of development, Defence had announced in December 1999 that the ANZAC WIP had been 'scrapped'.[249] Defence was quoted as saying "As the Department and industry continued to study the proposed upgrade, it became clear that it was not achievable within acceptable costs and risks for the capability improvements sought…"[250] Reaching this decision on this program represented a significant failure by Defence on a number of levels of performance, the capability considerations of which had to be factored in to development of the 2000 White Paper. Following cancellation of the ANZAC WIP, a re-examination of acquiring the Kidd class as an interim step in replacing the DDGs was dismissed by government on the basis that the issue would be addressed in its White Paper.[251]

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246 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff & Chief of Navy: Vice Admiral R.G. Taylor RAN. Dated 30 June 1997. (SPC.DS.39.1),* page 4

247 David Stevens, *Strength through Diversity: The Combined Role in Operation Stabilise*, page 21

248 ibid page 19

249 Janes Navy International, "ANZAC WIP Scrapped," *Janes Navy International,* 1 December 1999, 1

250 ibid

251 Janes Navy International, "News in Brief 'no' to Kidd Class," *Jane's Navy International,* 21 June 2000, 1-1

The White Paper noted: "Striking that balance (between security and fiscal responsibilities) is made harder by the environment of uncertainty in which defence decisions must be made. We cannot predict with certainty when or where Australia might need to use its armed forces."[252] The Government had found itself in the position where, despite its proclaimed policy of self-reliance and having wider security interests, since 1987 the ADF's force structure had been progressively narrowly interpreted and developed for the defence of continental Australia and its approaches. As a consequence, it did not have the balance necessary to meet operations such as undertaken in East Timor. In rebuilding its capabilities the Government acknowledged that the ADF would continue to develop "an integrated and balanced joint force" that could provide two key sets of capabilities to control the air and sea approaches to Australia against a credible hostile force, and to also deploy land forces similarly capable of controlling the approaches to Australia.[253] The shift in defence policy to increase the sea-borne deployment capability of the Army by means of two amphibious ships reintroduced naval and other considerations present in the Vietnam era. As we have seen in Chapter 2, convoy protection had been an important consideration in Australia's acquisition of its third DDG.[254] In effect, Australia was transitioning its defence policy towards adopting a maritime strategy for the ADF, and this would become a key strand in its posture of self-reliance short of calling for support under ANZUS as its ultimate guarantee.[255]

The White Paper of 2000 acknowledged that after the last DDG decommissioned in 2001, the surface fleet would consist of six FFGs and, ultimately, eight Anzac Frigates. The Paper again acknowledged that capable anti-ship missiles were proliferating in Australia's geographic proximity,[256] and while the FFGs were being modified, the Anzacs had deficiencies. For the first time in the series of defence policy documents since 1972, the 2000 Paper recognised

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252 Commonwealth of Australia, *Defence 2000: Our Future Defence Force*, page 6

253 ibid pages 53 - 54

254 Commonwealth of Australia, *Navy Programme Proposals. DECISION 622*, Vol. NAA: A5819,VOLUME13/AGENDUM 519 (Canberra: National Archives of Australia)

255 The ability of the ADF and US to work effectively together on operations that might be expected in ANZUS circumstances has been progressively tested in demanding exercises. In June 2005, Australia and the US jointly conducted Exercise Talisman Sabre. This was an advanced large scale maritime, amphibious and land operation held in the Queensland Shoalwater Bay defence training areas. See: Edward J. Marolda, *Ready Seapower - A History of the U.S. Seventh Fleet* Washington DC: U.S. Navy - Naval History and Heritage Command, 2012, pages 152-153

256 At that time several South East Asian countries were acquiring a range of air and surface ship launched anti-ship missiles of European, Chinese and American origin. India possessed advanced Russian missiles.

explicitly that there was "…the requirement for a long range air-defence capacity in the fleet. Without such capability, our ships would be more vulnerable to air attack, less capable of defending forces deployed offshore and less capable of contributing effectively to coalition naval operations."[257] This was an unambiguous appreciation of the demands of modern maritime conflict, but in context it represented a continuation of circumstances and solutions adopted after 1959 when the RAN had taken its initial steps towards acquiring an effective naval surface to air missile system through the DDGs. It could be seen as Australia relearning the lesson of having a balanced force in-being and of a suitable capability to give the Government the policy options it sought.

Decisions were taken to upgrade the Anzac frigates and provide a reasonable level of anti-ship missile defences, and to fit them with the Harpoon missile system for surface warfare. Ships that had been second tier warships were therefore to be upgraded, with the project due to start in 2001 and finish in 2007. A second and longer term policy objective was adopted which indirectly linked replacement of the upgraded FFGs with the DDGs:

> "…the FFGs are planned to be replaced when they are decommissioned from 2013 by a new class of at least three air-defence capable ships. It is expected that these ships will be significantly larger and more capable than the FFGs. The project is scheduled to commence in 2005-06."[258]

Replacement of the FFGs would be implemented through initiation of Project SEA 4000, tasked with delivering three ships colloquially known as Air Warfare Destroyers (AWD), and later titled as the Hobart class guided missile destroyers,[259] fitted with an upgraded USN Aegis combat system.[260] The enduring capability legacy of the DDGs can therefore be credibly regarded as the Hobart class. Those ships will return the RAN to having an advanced warship with capabilities for air defence protection of other ships, for making a considerable contribution to maritime operations generally, and for supporting land operations in proximate littoral areas. These were all important factors associated with the initial purchase of the Adams class.

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257 Commonwealth of Australia, *Defence 2000: Our Future Defence Force*, page 89

258 ibid page 90

259 "Air Warfare Destroyer (AWD)," http://www.navy.gov.au/fleet/ships-boats-craft/awd

260 The Auditor-General, *Air Warfare Destroyer Program (Department of Defence - Defence Materiel Organisation)* Canberra: Australian National Audit Office, 2014

White Paper 2009 - and Beyond

Defending Australia in The Asia Pacific Century: Force 2030 was presented by the Minister for Defence, Joel Fitzgibbon in April 2009.[261] The Minister highlighted the degree of change that had occurred in national security affairs over almost a decade since the White Paper of 2000. He mentioned how the terrorist attacks on the US in 2001 and similar events in other countries had all contributed to uncertainty. Fitzgibbon acknowledged that the new White Paper had been developed in the midst of a global financial crisis, but the Government was willing to pay the premium it believed necessary for national security.[262] His remarks echoed those of Beazley in 1987: there would be substantial additional investment in the capability of each of the Services.[263] In affirming the decision of the 2000 White Paper to provide for long range air defence at sea, the Paper remarked that it would proceed with the previously approved acquisition of three Air Warfare Destroyers and would equip them with the most advanced USN surface to air missiles (SM-6),[264] as well investigating the integration of them electronically with RAAF airborne early warning systems. This would provide for a very advanced maritime air defence system using the USN Cooperative Engagement Capability (CEC).[265]

With regard to the replacement of the Anzac frigates, the Government announced that it would acquire eight new Future Frigates, larger than the Anzac class vessels, with a strong emphasis on ASW.[266] Additionally, subject to successful sea trials for the first modified Anzac frigate, the Government intended to put all eight ships through the anti-ship missile defence

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261 Commonwealth of Australia, *Defending Australia in the Asia Pacific Century : Force 2030 (Defence White Paper 2009)* Canberra: Canberra : Australian Govt. Pub. Service, 2009

262 ibid Preface. Discussion of resourcing of this policy is beyond the scope of this study.

263 ibid

264 SM-6 is a member of the Standard Missile family developed by Raytheon for the USN, and intended to provide advanced anti-air warfare capabilities against aircraft and anti-ship missiles, as well as being effective in destroying ballistic missiles in flight. Raytheon Company (USA), *STANDARD MISSILES Public Release Portfolio Revision F (2012) (SPC.DS.27)*, 1-63)

265 CEC provides for the electronic networking of air and warship sensors to provide an extended range high quality radar picture to permit very long range engagement of airborne targets from ships. Commonwealth of Australia, *Defending Australia in the Asia Pacific Century : Force 2030 (Defence White Paper 2009)*, page 71

266 On 18 April 2016 the Government announced it would increase the number of frigates from eight to nine. See: https://www.minister.defence.gov.au/minister/marise-payne/media-releases/prime-minister-and-minister-defence-continuous-naval

upgrade program.[267] The first ship in the Anzac ASMD program would achieve its operational status in 2013, and seven further ships were intended to be progressively fitted with the system.[268]

Conclusions - Impact of the DDGs on Australian Defence Policy

This chapter has traced the interaction of Australian Defence policy and naval force structure development from the mid-1960s to 2009, with a particular focus on the DDGs as the RAN's foremost surface combatants within its order of battle.

Thirteen major Defence reviews were undertaken after the DDGs entered service in 1965 and are considered in this examination. Their primary purpose was to align defence policy with Australia's security circumstances and to provide for the resourcing of an appropriate force structure. Naval force structure considerations were an essential element of those reviews, and as the most powerful surface combatants in the RAN, the DDGs could have been expected to attract some priority for retention of their capabilities.

The RAN's force structure of 1972 had emerged from planning that took place in the late 1950s, but from the time of their acquisition in the mid-1960s, the DDGs represented its most modern warships. The same missile system as that fitted to the DDGs was mandated for the RAN DDL project which commenced development in the late 1960s. Its purpose was to increase the number of surface combatants, as well as replacing the RAN's obsolescent Darings. The Government chose to build three ships in Australia to a unique DDL design, in part because the RAN had determined the USN Patrol frigate (Perry class) to be unsatisfactory on several measures against its requirements. Following a change of government (from Coalition to Labor), the DDL program was cancelled in 1973, but after an extensive search the Perry class FFG was reassessed as being the best ship available. Although the CNS preferred acquisition of three ships as had been expected with the DDL project, only two were ordered from the United States in 1974 and became Daring replacements. The intention of increasing the number of surface combatants was not realised. The advantages of the FFGs included their missile and digital combat systems being very similar to those of the modernised DDGs,

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267 Commonwealth of Australia, *Defending Australia in the Asia Pacific Century : Force 2030 (Defence White Paper 2009)* Canberra: Canberra : Australian Govt. Pub. Service, 2009, pages 71 & 72

268 Janes Navy International, *ANZAC ASMD Upgrade Package Completes Final Acceptance Trial*, pages 1-2

and acquisition of the FFGs further enhanced Australia's naval standardisation and thus interoperability with the USN, a policy first implemented in its acquisition of the DDGs.

Following a subsequent change of government (from Labor to Coalition) a third FFG was ordered in 1977 as an item of election policy. From this point onwards it was much less likely that the RAN would return to the RN for its surface combatants. In 1980, in response to the invasion of Afghanistan by the Soviet Union, the Coalition Government acquired a fourth FFG from the United States. When the ship was delivered in 1984 (which provides an indication of the time required to deliver a ship from an existing production line even when the situation is urgent), the RAN had acquired seven surface combatants of USN-origin, all with the same surface to air missile system and similar combat systems that had their origins in the first modernisation of the DDGs. A re-elected Labor Government announced in 1983 that two more FFGs would be constructed in Australia, raising the total number of USN-origin ships operated by the RAN to nine. Regardless of early hesitation in making choices and some changes in political direction, the eventual acquisition of six ships of the same Perry class was an outcome which brought benefits to the RAN in terms of efficiencies in their operation and support, as well as introducing helicopter operations from surface combatants.

From 1972 until the late 1980s, Australia's defence planning was predicated upon having an extended warning time to respond to any significant threat, and in 1986 warning time for the emergence of a major threat to Australia was judged to be about 10 years. For naval capabilities, implementation of this policy embodied a concept of 'fitted-for-but-not-with' as a means of making provision for future modification if circumstances warranted, thereby reducing initial costs for the Anzac class. This concept overlooked the complexity and time required for modern shipbuilding and naval modernisation, and introduced risks of late and inadequate responses by a government should it hesitate to take action. Warning time for the first Gulf War in 1990-91 could, moreover, be measured in months and RAN FFGs were able to sail within a week of government commitment because the ships it had acquired from the USN did not require appreciable modification for combat. In effect this replicated the ease with which the DDGs had been deployed to Vietnam. Although *Brisbane* had completed its modernisation in 1988, it had to be further and promptly updated for Gulf operations just two years later. The 1990-91 Gulf War heralded the demise of government reliance on lengthy warning times for capability readiness, but it took until 1997 for the policy to be formally

repudiated. Having DDGs and FFGs fully fitted out for operations gave naval options to meet political objectives in responding to international security challenges to a degree that would not have been possible if the USN had adopted a fitted-for-but-not-with policy for their ships.

The 1987 White Paper incorporated the RAN-devised concept of Tiers as levels of capability, intended to aid understanding of its different classes of surface combatants. The RAN did not have a body of doctrinal knowledge it could provide to those needing to comprehend naval warfare until the year 2000, but the Tiers concept can be seen as an early attempt to convey insights into complex naval principles to those not so familiar. The DDGs and FFGs were included in the first Tier, the most capable level of ships. Occupying the same Tier implied equivalence, but those with relevant RAN experience did not agree with that relationship. The command and control, gunnery and missile system capabilities of the DDGs were superior, but command and control of naval operations in particular were not well understood outside the RAN. The more profound outcome was that in the White Paper of 2000, the Government was able to announce that the air defence and other capabilities of the FFGs were to be upgraded, but that these in turn were to be replaced by at least three larger ships of an advanced destroyer type more than 15 years later. These 'air warfare destroyers' would restore the capabilities lost through the demise of the DDGs. Notwithstanding, this drawn out result can be seen as the consequence of a prolonged period wherein Defence's senior leadership had an inconsistent appreciation of the strategic importance of the RAN's surface combatants, and the associated capabilities of its DDGs.

As an indication of the RAN's growing confidence and willingness to make an independent choice about its future warships without being bound to either the RN or USN, in 1987 the Government announced its intention to acquire eight Anzac class frigates of a modified German design. They were regarded as second Tier ships and intended to replace the six River class frigates in the same Tier. By 1991 however, the understanding that larger warships were needed to incorporate the volume necessary for modern combat systems was well known by the USN and RN. Given the RAN's close relationship with both navies, it ought to have been aware of such a physical constraint in terms of a small ship replacing the capabilities of the larger DDGs. Notwithstanding, in 1991 Defence chose to adapt the small Anzac frigate design to deliver a much higher level of capability, thereby introducing the significant technical risk which later emerged. The decision implies that Defence's senior leadership was insufficiently

knowledgeable and perhaps over confident in terms of the technical viability of the direction they were taking. In that sense, their choice has similarities to the unsuccessful steps of the Naval Board 30 years previously in exploring major technical changes to the Adams and County class designs in an effort to meet its requirements.

Defence's forecast in 1991 of multiple major ADF capabilities becoming obsolete by the end of that decade came to fruition. By 1997, the consequence of myopic planning was a choice having to be made by government between expensive new destroyers or fighter aircraft for the RAAF. The choice made was in favour of new aircraft, and of the RAN continuing with modernisation programs for the FFGs and Anzac*s* to achieve improved air defence and other capabilities. No new surface combatants were to be acquired, and the decision brought with it a high prospect of the FFGs being extended well beyond their operationally effective lives. Risks to the Anzac derivative design project (ANZAC WIP) became excessive, and after eight years of development it was cancelled in 1999, representing a significant failure on the part of Defence's leadership. The opportunity to acquire three ex-USN Kidd class destroyers as a capable interim replacement for the DDGs had emerged in 1997 but was declined by the Minister for Defence. It was briefly reconsidered after cancellation of the ANZAC WIP, but again dismissed by government on the grounds of addressing naval air defence requirements in a White Paper due in the year 2000.

The last of the DDGs retired in 2001, but their initial replacements, provided through the FFG modernisation program starting in 1994, were not all finally available until 2009. That program suffered extensive delays; the ships were out of operational service for a prolonged period; and the number of ships was reduced from six to four in order to manage costs. The 1991 Force Structure Review had predicted such an outcome and recommended against undertaking such programs. The penalty of the combined failure of the ANZAC WIP project and extended modernisation period required for the FFGs was the emergence of an air defence capability gap for the RAN, one previously filled by the DDGs, albeit with increasing obsolescence.

From the time when they were acquired in the mid-1960s, the DDGs provided foreign and defence policy options to Australia's Government, particularly in combat operations in Vietnam where they fitted seamlessly into USN led operations. The DDGs were similarly used as instruments of government policy from the 1970s to the 1990s in demonstrating Australia's

resolve and support for its major ally in responding to the Soviet presence in the Indian Ocean and Afghanistan, and against Iraq in the first Gulf War. The DDGs were capable of commanding other RAN units, integrating into USN battle groups as valued participants, and contributing to Australia's wider national objectives as required. Until the very early 1990s, the DDGs were important conduits of Australian power when its government needed naval options to defend and promote Australia's interests. Such a capability could have been expected to be valued within the overall force structure of the RAN and the ADF more broadly, but the evidence shows such appreciation to have been intermittent. Prospective obsolescence of the DDGs had been identified in the Dibb Review of 1986, the White Paper of 1987, ASP-90, FSR-91, the Strategic Review of 1993, and in the 1994 White Paper. The 1997 *Strategic Policy* sealed their departure without a direct replacement and determined that their capabilities would be provided through the modernised FFGs. Although the DDGs were core capabilities of the RAN, they became victim to competing priorities and fiscal constraints. Inconsistent policies, inadequate planning, a lack of understanding of the complexities of warship acquisition and of naval operations, and adoption of high risk technical solutions by the RAN and Defence all contributed to that outcome. From the continuing lack of urgency to deal with this issue, it can also be inferred that at senior levels of the Department and at a political level, the strategic importance of the RAN as an element of Australia's national power at that time was incompletely understood.

Defence policy development is necessarily a continuum and major force structure determinations always have long term consequences. For most of the period of service by the DDGs, Australia's defence policy was predicated on giving primacy in force structure to the strategy of direct Defence of Australia, meaning defence against an attack through Australia's northern sea and air approaches and then against the continent. Such a scenario was the most unlikely, and in all probability would have required invocation of ANZUS, but its importance necessitated a force structure to hedge against that circumstance. Hedging created conundrums when planning discipline was not consistently exercised in regard to acquisition of major capabilities and balancing resources. Notwithstanding, the primacy of the Defence of Australia strategy was not regarded by Ministers as constraining Australia's ability to participate in wider global situations of its choosing. There would seem to have been an assumption by the Government, proven false in practice, that the simultaneous requirements of defending both Australia and its wider interests were harmonious in the force structure

choices it was making. In the naval context, by 1997 the role of the DDGs does not seem to have been deeply considered within that frame of reference.

Australia's commitment of the ADF to operations in East Timor in 1999 represented a watershed in its defence and foreign policy settings. Australia had visibly taken steps to defend its interests by ensuring a managed transition of power in one of its nearest neighbours. On that occasion, its force structure was found wanting in the air defence capabilities of the RAN's surface combatants, which had to be overcome through the presence of units of the USN and RN. Through a focus on the primary policy determinant of Defence of Australia, the ADF's force structure had in fact become unbalanced and unable to meet aspects of that unforeseen offshore contingency. This represented a failure of Defence strategic policy design and force structure implementation, and it can be inferred that there was a lack of cohesion in the understanding of Ministers and their advisors in terms of what was really expected of the ADF and of what it could provide, and of the Navy within that thinking.

Australia's defence policy from the year 2000 onwards incorporated elements of a maritime strategy whereby protection of afloat-forces and other units, such as had been required many years before when the DDGs were acquired, had re-emerged as a key priority. The Government directed that a more balanced ADF be developed, and the RAN therefore again needed DDG-like advanced surface combatants in its force structure. In that context, for approximately 35 years the DDGs had been enduring core capabilities of the RAN and a key means by which it retained the ability to be an effective instrument of government policy, regardless of the variable comprehension at senior policy levels of that important contribution.

The Hobart class Air Warfare Destroyers announced in the 2000 White Paper emerged from the Government's rebalancing of the ADF's force structures and are the longer term successors to the Adams class DDGs via the RAN's modified FFGs. The indirect legacy of the DDGs and their capability can therefore be seen in terms of being an enduring contribution to the self-reliant defence of Australia.

Chapter 4 – The DDG Impact on RAN Digital Combat Systems

> "Since *Perth*'s return to Australian waters, she has had some opportunity to demonstrate her ability in exercises at various levels of complexity. Stated simply and subjectively put, her performance has not matched up to that expected…in certain threat situations the updated DDG may become little more than a target…(we) need to know more than we do now about the updated DDG's capabilities."[1]
>
> Lieutenant Commander R.A.K Walls RAN, Fleet Direction Officer. 17 August 1976

This chapter examines the transition of the DDGs from the analogue to the digital combat systems era, and the impact this had on the RAN. The DDGs were acquired with analogue combat systems just as the USN commenced a general installation of their digital replacement in other classes of ships. The USN intention of modernising all of its Adams class was not realised.

Within five years of *Perth*'s commissioning in 1965, plans were developed to replace the analogue Tartar missile system and most Combat-Information-Centre (C-I-C)[2] equipment of the DDGs with digital technology, and implemented in 1974-75. Introduction of the USN Perry class FFGs from 1980 built upon RAN knowledge gained through operating its Naval Combat Data System (NCDS) in the DDGs, and facilitated more efficient software management for both classes. Applying RN fighting doctrine through a USN combat data system required operational compromises to be made, and the inadequacy of shore-based training equipment for much of the DDGs' service lives placed limits on the operational training of DDG personnel and on RAN tactical development. River class frigates were also substantially modified, but their combat data systems remained analogue, and they had no means of sharing digital data as became possible between DDGs and FFGs via Link 11. The lack of a navy-wide plan for its combat data systems limited the RAN's choices when the FFGs were modernised and when it chose the combat data system for its later Anzac frigates. The RAN continued to have difficulty in formulating operational requirements, linking them to technical performance specifications,

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1 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1),* A.F. 5/3/94 Canberra: Sea Power Centre Australia. Enclosure 4 pages 4-5

2 The RN equivalent of the C-I-C is 'Operations Room'.

and testing the outcomes. The chapter demonstrates that the combat system capabilities of the DDGs became obsolete several years before being removed from service, but the knowledge gained through the acquisition of NCDS for the DDGs provided long term benefits to the RAN.

Introduction

The experience of allied navies during WWII demonstrated their difficulty in defending against massed air attacks.[3] During that conflict the management and conduct of the air battle was performed manually by naval personnel tracking radar contacts, which were then engaged by the ships' armament and fighter aircraft. Coordination between units was eventually achieved using voice radio but the overall process was limited by the skills of the radar operators and their supervisors. In limited time they had to detect, track and prioritise threats, and take action - all in circumstances of danger and high personal stress.

With the evolution of jet engine, flight guidance, homing and other technologies post-WWII, aircraft were predominantly replaced by guided missiles in the anti-ship attack role. The missiles were capable of high speeds and designed to minimise the reaction time for defending ships. Soviet tactics included saturation missile strikes intended to overwhelm the defensive systems of warships, and automation became necessary to manage the steps involved from detection to defeat of the threat. Computers could process inputs from sensors, track targets, assess and prioritise the level of threat based on a variety of considerations, and assign weapons to the target. Not only could computers assist at the single ship level but, by linking computers of multiple ships in a network, they could enable efficient and effective engagement of threats by all means available to the force.

Perth was commissioned in July 1965, but in September 1974 it was back in the United States where it became the RAN's first ship to be fitted with a digital combat system. *Brisbane* and *Hobart* were subsequently converted in Australia. The Perry class FFGs as acquired by the RAN were fitted on construction with a derivative of the digital systems first installed in *Perth*. Hence, the DDGs were the ships through which the RAN first learned to operate digital combat

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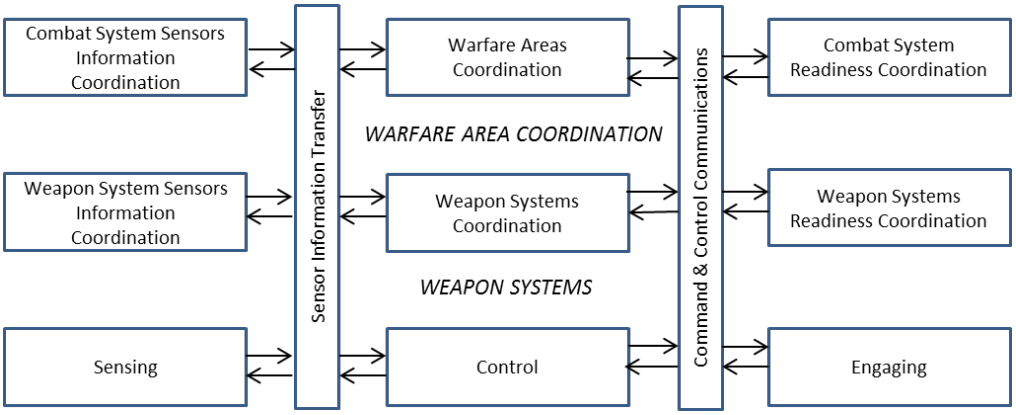
[3] This circumstance has been examined elsewhere. For example see: George W. Baer, *One Hundred Years of Sea Power: The U.S. Navy, 1890-1990* California: Stanford University Press, 1994, pages 136 and 209. David L. Boslaugh, *When Computers Went to Sea* Los Alamitos, California: IEEE Computer Society, 1999 pages 1 to 3. Norman Friedman, *U.S. Destroyers: An Illustrated Design History*, Revised ed. Annapolis, Md.: Naval Institute Press, 2004, pages 1 to 5

systems in naval warfare, and they were the first major Australian military units to receive a digital computer-assisted command and control system.[4]

Definitions – Combat System and Combat Data System

A combat system[5] in its most basic form is a system for processing targets, in that it provides the path for a series of steps leading from their detection to engagement.[6] In overall terms it is defined as "…the combination of human, computer, and network elements that constitute the warfighting capabilities of a ship."[7] Human management and control of the combat system and its sub-systems is an intrinsic aspect of their design. Elements of the combat system, such as the navigation sub-system, can provide data concerning the position of the ship and its motion as represented, for example, by pitch and roll and speed through the water. Such data can be provided to multiple equipments or software requiring its use. A very high-level functional diagram of a naval combat system as utilised in this chapter is that shown in Figure 2 as was used by Pollard.[8]

Figure 2: Naval Combat System – Functional Arrangement



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4 N. Newman, "Future Australian Combat Computer Systems (Annual Engineering Conference 1976: Engineering 1976-2001)," *Engineers Australia* (1976), 322-325. Page 322

5 The term 'combat system' was not widely used in the RAN until NCDS was introduced. RN terminology distinguished between sensors, weapons, communications and the Action Information Organisation.

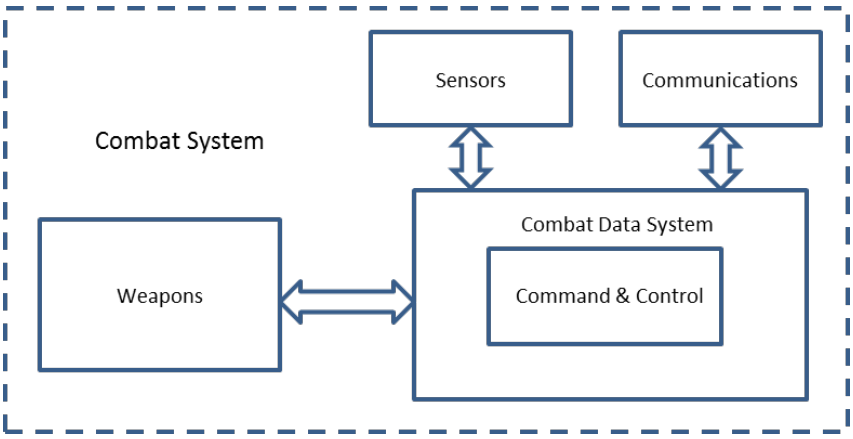
6 Bernard G. Duren and James R. Pollard, *Combat Systems Vision 2030 Combat Systems Architecture: Design Principles and Methodology* Dahlgren Virginia: Naval Surface Warfare Centre, 1991 page 6

7 ibid

8 James R. Pollard, *Combat Systems Vision 2030: Functional Architecture for Future Combat Systems* Dahlgren Virginia: Naval Surface Warfare Centre, 1991, page 2

The combat data system[9] is a major sub-system of the overall combat system and primarily concerned with enabling the effective command and control of the ship, management of the sensing and evaluation processes, and control of the target engagement process. It does this by processing and displaying data it receives from sensors and via communications in providing decision support aids to the ship's command team.[10] A simplified representation showing the structure of the combat system with the combat data system, as derived by the author is shown in Figure 3.

Figure 3: Naval Combat System - Simplified



Early Development by the USN

As the RAN was making its decision to acquire the Adams class, the USN and RN had been working separately on the application of digital computers in automating the air defence process, and at the outset data links were intended to be interoperable between allies.[11] USN development progressed from the mid-1950s, eventually becoming known as the Naval Tactical Data System (NTDS). In April 1961, NTDS was trialled under live training conditions and approved for wide installation across the USN.[12]

Although the High Frequency (HF) radio data link (for sharing information between ships in real-time) had proven successful at extended ranges, the Ultra High Frequency (UHF) radios

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9 Where the term 'combat management system' is referred to in this chapter, it is also meant to mean combat data system unless shown otherwise.

10 Although written in 1991 and focused on the future, Duren and Pollard provide a clear explanation of the interacting elements of combat systems that has endured since development of the Naval Tactical Data System by the USN in the late 1950s.

11 David L. Boslaugh, *When Computers Went to Sea*, page 179

12 ibid page 258

were unreliable and did not pass test.[13] The RN took until October 1970 to complete trials of its first computer systems.[14] Whilst it was not trialled until 1961, in 1960 the USN was already anticipating that NTDS would be fitted to the Adams class.[15]

In 1962, at the time when the Adams class was being constructed, the USN was constructing the Belknap class, its first class of ships armed with the Terrier medium range surface to air missile system utilising the newly designed AN/SPS-48 radar for target acquisition. The nine ship Belknap class was destined to have a longer life in the USN than the Adams, and it remained a class of high capability air defence ships until eventually replaced by those fitted with Aegis.[16] USS *Wainwright* was third of the class and it commissioned in January 1966,[17] less than a year after *Perth*. *Wainwright* became the first USN ship fitted with the systems package of AN/SPS-48, NTDS and the WDS-11 digital weapon direction system; trials of the whole system were conducted in September 1965.[18] Friedman notes that the first of class cost for the Belknap class[19] was US$67m, but that the follow on cost of a production ship was US$49m.[20] The cost of NTDS and its data link added US$6.9m to the follow-on ship.[21] Collectively, the estimated cost of an NTDS fitted follow on ship of the DLG-26 class, such as *Wainwright*, was about US$56m.[22] Without ancillary costs, the price of an RAN Adams class was US$39.3m.[23] In comparative terms, the cost of an NTDS fitted production rate Belknap

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13 ibid page 257

14 Norman Friedman, A. D. Baker and Alan Raven, *British Destroyers & Frigates: The Second World War and After* London: Chatham Publishing, 2006. Page 191

15 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 41 Folder C-DDG/4720 1/1/60. Ship Characteristics Board Memo No 97-60 Ser 0239P42 dated 7 June 1960. Enclosure 1 Appendix 3

16 Malcolm Muir, *Black Shoes and Blue Water: Surface Warfare in the United States Navy, 1945-1975* Washington, D.C: Naval Historical Center, Dept. of the Navy, 1996, pages 214-215

17 Janes Information Group, *Jane's Fighting Ships 1966 - 67*, ed. Raymond Blackman London: Jane's Fighting Ships Publishing, 1968, page 363

18 David L. Boslaugh, *When Computers Went to Sea*, page 325

19 They were also known as the DLG-26 class. The USN had referred to 'Destroyer Leaders' as frigates, but frigates were regarded by other navies to be smaller and less capable ships. The USN adjusted its nomenclature on 30 June 1975. See: Norman Friedman, *U.S. Destroyers: An Illustrated Design History*, page 314. The Belknap class thereafter were regarded as cruisers, with *Belknap's* nomenclature becoming CG-26.

20 Norman Friedman, *U.S. Destroyers: An Illustrated Design History*, page 293

21 ibid

22 Obtained by adding the cost of NTDS to a follow on Belknap: US$6.9m + $49m = $56m.

23 The cost to Australia for an Adams class ship was US$39.3m without ammunition or spares. Commonwealth of Australia, *Australian Consulate General New York Purchase Order for 2 DDG 2 Class Destroyers. Dated 26 October, 1961 (SPC.DS.9),* Navy File 1215-201-76 Canberra: Sea Power Centre Australia.

was about US$16.7m per ship (in same year prices), or approximately 42% more than the price paid by Australia for its Adams class.

Rear Admiral Griffiths had been a Captain on the Naval Staff. He is under the impression that the RAN did not have an understanding of NTDS when *Hobart* commissioned in 1965, and that it was equally possible that the RAN was not regarded sufficiently well by the USN for discussions on that topic to take place.[24] The RAN had confined its interest solely to the Tartar missile during its exploration of options to provide a surface to air guided missile system.[25] As we have seen, the likelihood of Australia's Government being willing to meet the extra cost of acquiring a Belknap was almost certainly out of the question. But it is not evident from the information available that life-cycle cost considerations played any part in making the overall assessment of value for money of the Adams class.[26] If the operational capabilities and management of obsolescence had been considered, the higher performance of the NTDS Belknap[27] over a longer period may have represented better value than the Adams. Conversely, acquiring a ship that was clearly much more technically advanced than the Adams class would have presented an extreme challenge to the RAN, and have entailed greater risk for its effective operation and support. The DDGs already represented a marked advance on what was then in service with the RAN, and knowledge of USN digital combat systems by the RAN at the time appears to have been minimal. From the perspective of applying advanced technology for its purposes, it suggests strongly that the RAN with its RN-origin force structure had much to learn and gain from its emerging relationship with the USN.

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24 Interview with Rear Admiral Guy Griffiths*,* 13 and 19 January 2012. Page 20

25 The successor to SM-1 was SM-2. Raytheon Company (USA), *STANDARD MISSILES Public Release Portfolio Revision F (2012) (SPC.DS.27),* DSER # 214754 Washington DC: Raytheon Company. SM-2 had a range in the order of 100 nautical miles and was first deployed in USS *Wainwright* in 1976. A contract to fit SM-2 to the RAN FFGs as part of their upgrade program was not let until 2007; six years after the last DDG had gone out service. See: The Auditor-General, *Management of the FFG Capability Upgrade (Department of Defence - Defence Materiel Organisation)* Canberra: Australian National Audit Office, 2007

26 In 1997 the Auditor-General considered that life-cycle costing by the Australian Department of Defence still had considerable room for improvement in its application to major capital acquisitions such as the DDGs. See: The Auditor-General, *Life-Cycle Costing in the Department of Defence* Canberra: Australian National Audit Office, 1998, pages xiii-xv

27 Friedman highlights that at about the same time that the Adams class was being constructed the USN reviewed warship costs against capabilities. He notes that the cheap, high capability mass production destroyer for the USN became the Belknap class cruisers. See: Norman Friedman, *New Technology and Medium Navies* Jervis Bay, N.S.W.: RAN Maritime Studies Program, 1999, pages 40-41

Griffiths remarks that during Vietnam operations he sent Lieutenant Robert Walls and two Leading Seaman to the nuclear powered cruiser USS *Long Beach*, and "…it changed their day a bit."[28] Griffiths was referring to their use of NTDS in *Long Beach* to assist them in vectoring fighter aircraft toward North Vietnamese attacking aircraft. This was the first exposure of RAN personnel to the compilation of a tactical air picture enabled by the exchange of information in real-time via data links in a combat zone. *Hobart* was not fitted with such capabilities and relied instead on analogue picture compilation using plotting methods similar to those of WWII developed some 20 years previously.

The USN Adams class was initially fitted with the AN/SPS-39 search radar to provide three-dimensional target coordinates to the Tartar system,[29] but this was found to have unsatisfactory performance. Its replacement was the AN/SPS-52 radar which, in a manner similar to the AN/SPS-48, used electronic beam scanning in the vertical plane to determine target elevation while the antenna was being mechanically rotated in azimuth. Target output coordinates to Tartar were generated in a digital computer. *Perth* was the first of the entire Adams class to be fitted with AN/SPS-52 while it was in building and Commodore Cooper recalls that there were serious problems when it was first installed, with US contractors taking about three months to demonstrate that it worked.[30]

RAN Analogue Combat System – Hobart Data Overload

After the mistaken air attack on *Hobart* by the United States Air Force (USAF) off Vietnam on 17 June 1968, the RAN post-action report showed how difficult it was to cope in such a dense air environment.[31] The report noted that it was normal for about 120 aircraft to be within 200 miles of the ship in such circumstances, but: "Because of the absence of automation in the DDGs it is not possible to track all these aircraft continuously and only those aircraft not displaying friendly IFF[32] are tracked."[33] Even though *Hobart's* radars were much more

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28 Interview with Rear Admiral Guy Griffiths. Page 20

29 Those coordinates were the horizontal angle relative to the front of the ship, the range to the target, and its angle of elevation from the ship. The measurements were taken simultaneously and transferred to the missile system to enable it to locate and track the target with its own fire control radars.

30 Interview with Commodore Ormsby Cooper, 15 September 2011. Page 22

31 Royal Australian Navy, *Accidental Attack on HMAS Hobart by US Aircraft in Vietnam Waters (SPC.DS.20),* Navy File 68/1381 Canberra: Sea Power Centre Australia.

32 IFF – abbreviation for Identification Friend or Foe – an electronic identification system used to discriminate between hostile and friendly aircraft through the use of pre-planned codes.

advanced than those of WWII, its overall ability to make sense of the information they presented in such an environment was only marginally better. The USN had built a developmental system to automatically process IFF responses and successfully tested it onboard USS *Belknap* in the Tonkin Gulf in 1967, a year before *Hobart* was struck, and it was approved for entry to USN service in 1968.[34] The equipment was known as the Beacon Video Processor (BVP) and was subsequently incorporated in the Junior Participating Tactical Data System (JPTDS) as later acquired by the RAN.

Early USN Aspirations for NTDS in the Adams class

Installation of NTDS in the Adams class was first considered by the USN Ship Characteristics Board (SCB) in June 1960.[35] A "Small Ship" NTDS equipment suite had been developed but was estimated to require 13 more personnel than the analogue combat system, with an additional cost of US$4.96m per ship plus US$0.45m to develop the associated class plans. The increased personnel were primarily maintenance staff to support the new electronics equipment. That proposal was based on the AN/USQ-20 digital computer being linked to eight operator consoles to manage picture compilation, but without a digital interface to the Tartar missile system.[36] Complications arose with the space and weight required for the first generation NTDS equipment, and while the new USN Belknap and Coontz classes had been designed to accommodate that requirement, the Adams class had not.[37] The Bureau of Ships highlighted that for the Adams to retain an acceptable margin of weight growth[38] there would have to be compensating reductions to the ships' overall weight and that removal of the after gun (Mount

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33 Royal Australian Navy, *Accidental Attack on HMAS Hobart by US Aircraft in Vietnam Waters (SPC.DS.20),* Navy File 68/1381 Canberra: Sea Power Centre Australia.

34 Norman Friedman, *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars* Annapolis, Md.: Naval Institute Press, 2009, page 79

35 United States Navy, *Records of the Bureau of Ships* Box 41 Folder C-DDG/4720 1/1/60. Ship Characteristics Board Memo No 97-60 Ser 0239P42 dated 7 June 1960

36 ibid. Enclosure 1 Appendix 3

37 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 41 Folder C-DDG/4720 1/1/60. Chief, Bureau of Ships Memorandum: Ser 450-018 dated 25 April 1960

38 Warships are typically designed to have some weight growth over their operational lives as changes are made to their capabilities. It ensures the hull is strong enough for that eventuality. RAN DDGs required continuous weight management. See: David C. Neumann and Warren F. Smith, "HMA Ships: A History of RAN Ship Weight Control," *Pacific 2004 International Maritime Conference,* 2004, 651-655

52) and its infrastructure was an option.[39] Weight growth designed into the DDGs was only 19 tons and removal of the gun was not operationally acceptable to the USN.[40] A further reduced version of the Small Ship NTDS was proposed to the SCB, but it resulted in a minimalist installation that removed the primary benefits of computer assistance in operation of the combat system.[41]

USN policy advice on the installation of NTDS in the Adams class was provided in June 1960 by the Director of the USN Long Range Objectives Group.[42] The status of the class as being less important than the larger USN combat ships was made clear, and accordingly they had lower priority for NTDS funding even though the ships would operate with carrier battle groups. As an indication of just how differently the USN considered the importance of these ships from the RAN, the Director noted "A contributing consideration is the fact that TARTAR-equipped ships will ultimately be regarded as possessing primarily a self-defense AA capability having relatively small value as a part of a coordinated anti-air system in a task force."[43] CNS Burrell assigned the ships much greater importance for the RAN, wherein its DDGs were in effect replacing its FAA fighter aircraft defences, therefore being required to provide air defence to other units as well as themselves.[44] This contributed to a consistent difference of view on the parts of the USN and RAN concerning the significance of the Adams class, reflecting the relative value of such capabilities to a major and middle naval power. The USN's much larger order of battle gave it options the RAN did not have and, as we shall see, the USN later

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39 United States Navy, *Records of the Bureau of Ships* Box 41 Folder C-DDG/4720 1/1/60. Chief, Bureau of Ships Memorandum: Ser 450-018 dated 25 April 1960. Enclosure 3

40 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: Sonar improvements in combatant ships Ser 452-0110 dated 20 April 1961 (this refers to the weight growth potential of the DDG-2 class).

41 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 42 Folder C-DDG2class/9020. Memorandum: for the Chairman, Ship Characteristics Board Ser 0103P34 dated 5 May 1960

42 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 42 Folder C-DDG2class/9320 1/1/60. Memorandum: for Chairman Ship Characteristics Board Ser 044P93 dated 15 June 1960 (NTDS in Destroyers)

43 ibid

44 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder BU (Vice Admiral Henry Burrell RAN) Washington DC: United States Navy. Letter Burrell to Burke dated 18 November 1960.

severely circumscribed its own JPTDS program to meet other objectives, whereas for the RAN such a program represented a major capability enhancement of its ships.

In early 1964, the USN Tartar program manager convinced officials that sufficient savings could be made in reducing the cost of ordinance equipment alterations (ORDALT) to justify replacing analogue computers with digital versions, the benefit being that ORDALTs could be installed in months rather than years.[45] The first operational Tartar digital fire control system was installed in an Adams class DDG in 1971, the USS *Joseph Strauss* (DDG-16).[46]

RAN DDGs and the Naval Combat Data System – Early Days

Improving the Knowledge of the RAN

The strategic threat assessment made in 1964 by the Australian Chiefs of Staff was that Indonesia was capable of developing an effective air defence system over Java and had the ability to develop a strike force of long range subsonic and limited supersonic offensive capabilities.[47] Such Indonesian capabilities of Soviet origin brought a potentially similar air defence problem for the RAN as confronted by the RN and USN in facing the Soviet Union as their primary air threat. The RAN was, to a limited extent, aware of RN digital combat systems development from the late 1950s, and the earliest relevant versions of its equipment were listed as options for an RAN variant of the Hampshire class.[48] An improved RAN understanding of RN and USN progress emerged from the late 1960s as shown in a 1969 report by Captain Lord.[49]

In June 1969, a comprehensive assessment of digital combat systems and associated matters was provided by Captain Frank Lord, a former General Manager of the Williamstown

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45 David L. Boslaugh, *When Computers Went to Sea,* page 364

46 ibid page 365

47 Stephan Frühling, *A History of Australian Strategic Policy since 1945* Canberra: Defence Publishing Service, 2009, page 318

48 Commonwealth of Australia, *Navy Program Proposals 1960*, Vol. NAA: A1945, 84/3/4 Part 1 (Canberra: National Archives of Australia) Minutes of Joint Planning committee of 11 August 1960, Appendix B to Report by the Chiefs of Staff Committee – Navy Program Proposals 1960. The RN ADA (Action Data Automation – a digital combat system) and TIDE (Tactical International Data Exchange – a data link) was shown in the minutes of the meeting as having an unknown availability at that time.

49 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1),* 1626/204/415 Canberra: Sea Power Centre Australia.

Dockyard,[50] who was then at Navy Office.[51] The report presented the state of the art in combat data systems to the Naval Board, in so far as it could be ascertained, and included a general scheme for development of a combat data system for the RAN.[52] Lord noted "It is difficult to escape the conclusion that digital computer assisted data processing in some form is inevitable if R.A.N. ships are to continue to play an adequate part in any integrated force in the future. It is the key to more efficient control of task groups and offers the only prospect of timely and effective action in some environments."[53] Lord highlighted how the costs were likely to be high and substantial shore based support would be required, and that "… design and manufacture of a surface ship system is within the competence of a number of large overseas firms each affiliated with a local company…Competitive design studies are envisaged."[54] The report also noted that the Naval Staff Target No 8 of 1968 entitled "Action Data Handling System for the RAN" had been approved by the Naval Board.[55]

On 11 October 1968 the Naval Board decided that a project team should be formed, which assembled in Navy Office on 3 February 1969 and comprised Captain Lord, Lieutenant Commander J.E.C. Williams, and Dr S.G. Frazer who was spending a year with Defence while on sabbatical leave from Queensland University. At the same time, an attempt was made to prepare a computer flow diagram of "action data" arising from a recent exercise with a Type 12 Destroyer Escort.[56] The purpose of the flow chart is unclear, but could have been an attempt to understand the relationships between functional components of the operations room and to derive their associated data requirements. The RN experience with combat data systems was similar in outcome to that in USS *Oriskany* with NTDS removing the need for 28 crewmembers.[57] Lord reported that the aircraft carrier HMS *Eagle* was fitted with a degree of

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50 Sea Power Centre Australia, *The Navy List September 1968* Canberra: Department of Defence (Navy), 1968, page 17

51 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1)*, Covering Letter.

52 ibid. Section 1 – RAN Combat Data System – Introduction: Paragraph 7.

53 ibid. Covering Letter.

54 ibid. Covering Letter

55 Captain Lord had chaired a steering committee meeting on 23 August 1968

56 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1).* Section 1 – RAN Combat Data System – Introduction: paragraphs 3 to 6. The report uses the term 'Type 12', although the RAN typically referred to them as the River class.

57 David L. Boslaugh, *When Computers Went to Sea*, page 257

automation and could similarly save 60 men, in comparison with the aircraft carrier HMS *Victorious* which was not.[58] Such reductions in manpower were not necessarily achievable in more modern analogue ships such as the Adams where installation of NTDS would have increased the original USN crew size by 13.

David Wellings Booth noted that work had commenced in 1968, led by Captain Peter Hutson, in evaluating combat systems options from the US and Europe for suitability and use by the Light Destroyer (DDL) project.[59] Lord provided more detail, reporting that in February 1968 a Defence team had conducted a nine week overseas mission to examine and evaluate weapon equipment and systems likely to meet the various Naval Staff Requirements associated with the development of a light destroyer of approximately 2,000 tons deep displacement. Seven proposals were then received by the DDL[60] project, of which three were considered acceptable alternatives.[61] Lord identified how the USN was attempting to solve the ASW requirement through development of a separate ASW Command and Control System that also incorporated other functionality such as the control of interceptor aircraft.[62] Work progressed and the Commanding Officer of *Perth*, Captain Ian Burnside, commented in his July 1971 *Report of Proceedings* (ROP) that "…on several occasions, civilian members of the Naval Control Data System Project Team and the Light Destroyer Team have visited the ship."[63] *Perth* was to become the first ship of the RAN to be fitted with a digital combat system.

RAN Combat System Upgrade Options

RAN options for modernising the DDGs were limited. Installation of an RN system was not practicable given the existing USN sensor and weapon capabilities of the ships and the likely costs of integrating dissimilar RN and USN equipment. The option of adopting the German

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58 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1)* Section 1 – RAN Combat Data System – Introduction: paragraphs 23 and 24

59 David Wellings Booth, Geoff Cannon and Glenn Bridgart, "The History of NCDS in Australia," in *Memories of CDSC (Where the Navy Went to Bits)* (Canberra: Royal Australian Navy, 2009b), 1-3, page 2. (This book is not paginated or indexed; reference is made to Chapters and to their pages as counted. The book is available at the Sea Power Centre Australia.)

60 DDL – abbreviation for Light Destroyer

61 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1)* Section II - Overseas Development – DDL Project Report - paragraphs 39 to 44

62 ibid. Section II - Overseas Development – Development in the USA - paragraphs 59 to 64

63 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1971 to December 1971,* AWM78-292-8 Canberra: Australian War Memorial. Page 100

digital combat system fitted to their Rommel class DDGs, itself a derivative of NTDS,[64] was not apparently considered. As will be seen, commercial alternatives had been shown to be technically risky and expensive. An option existed not to modernise the DDGs, but this would require an acceptance that they would become increasingly operationally ineffective, leading to constrained government options for naval support, and to its major ally - the primary reason for which they had been acquired. A further option, which could proceed in lieu of the NCDS modernisation, or in parallel if funding and timing were practicable, would have been to commence seeking a more capable ship and advanced combat system. This was the path taken by the RN in replacing the County class with its Type 42 Sheffield class destroyers when Seaslug was replaced by Sea Dart, which finished its testing at Woomera in 1974.[65]

As we shall see, when the USN decided to forego further modernisation of its own DDGs, the RAN was already committed to acquiring the Junior Participating Tactical Data System (JPTDS), demonstrating that the RAN's intention of being nationally independent in managing its NCDS software was wise.[66] Notwithstanding, the RAN may have anticipated greater involvement and collaboration with the USN over the evolution of JPTDS, but the unimportance of JPTDS to the USN removed the potential breadth of that opportunity. The lack of an Australian combat systems industrial capability to which the RAN might have turned also further constrained its options.

RAN Acquisition of the USN Junior Participating Tactical Data System

Friedman notes that JPTDS[67] was not at the high end of naval combat data system capability and was destined for a short life in the USN. He comments that it was a very simple system and could be installed in a ship's regular maintenance period.[68] The system could only manage 128 tracks, 64 local and 64 remote tracks, representing about half the capability of a full NTDS

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64 David L. Boslaugh, *When Computers Went to Sea*, page 292

65 Peter Morton, *Fire Across the Desert: Woomera and the Anglo-Australian Joint Project 1946-1980* Canberra: AGPS Press, 1989. Page 353

66 Royal Australian Navy, *Project Directive no 63 - Naval Combat Data System. Dated 29 May 1973. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 104) (SPC.DS.46.1).* Page 2. Software associated with its various Standard missile systems was managed by the USN for the RAN. NCDS was required to interface with the missile system so both RAN and USN tests were necessary to ensure compliance with the relevant requirements.

67 The RAN referred to JPTDS as the Naval Combat Data System when installed in the RAN DDGs – and later in the FFGs.

68 Norman Friedman, *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars*, pages 86-87

ship.[69] Friedman also notes that the USN had contemplated upgrading all of its Adams class, but with each ship costing approximately US$200m, estimated to be about the same cost of acquiring an FFG, the program was never fully funded.[70] In 2012, the Adams class would be referred to as a second-generation missile ship by USN Under-Secretary Work.[71]

Lieutenant Commander Peter Purcell joined the Australian Embassy in Washington in 1972 to liaise between Australia and the USA for the DDG JPTDS/NCDS upgrade. He recounts that the USN was then pressing hard to fit a tactical data system in their less capable ships and that Captain Eric Swenson USN[72] was the driving force behind the program to upgrade Tartar to digital as well as deliver on the tactical data system.[73] Purcell notes that Australia was keen to be in both of these programs and he participated in negotiations to assist in guiding the project for Australia. In terms of whether installing a non-US digital combat system in the DDGs was possible, Purcell remarks "For the DDGs it had to be an American system. We didn't have the engineering capacity to put anything else in."[74] Purcell comments that Australia was important to the USN JPTDS program because if Swenson could demonstrate that an allied Navy also wanted to purchase the system, he could get it through the US Congress. Australia committed US$50,000 and the USN gained Congressional approval,[75] but the RAN was its only non-USN customer.[76] Purcell observes that the upgrade to NCDS in the DDGs was fundamentally about staying in step with the USN, and that because the USN would have more than four ships modernised with JPTDS, the RAN would need to keep up or be left with ships with a combat system no longer supported by the USN.[77]

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69 Remote tracks are so called because they originate in a separate platform and are shared via the data link. The combat data system manages remote and local tracks within NCDS/JPTDS.

70 Norman Friedman, *The Naval Institute Guide to World Naval Weapons Systems* Annapolis, MD: Naval Institute Press, 1990, page 158. The RAN cost of JPTDS was not as high as that for the USN, so it is probable that other changes to USN ships were being contemplated at the same time.

71 Christopher Cavas, "US Navy Reviews how to Count its Ships - Interview with U.S. Navy Undersecretary Bob Work," *US Defense News,* 30 April 2012, 18. Work remarked that the first generation was experimental. By 2012 the USN regarded itself as being equipped with its fifth generation of missile ship.

72 Swenson was one of the principle architects of NTDS and at that time was the USN NTDS Project Director. His story is told in: David L. Boslaugh, *When Computers Went to Sea*.

73 Interview with Rear Admiral Peter Purcell*,* 23 April 2012. Page 28

74 ibid page 29

75 ibid page 30

76 Norman Friedman, *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars*, pages 86-87

77 Interview with Rear Admiral Peter Purcell. Page 43

Defence first sought Government approval for the DDG NCDS Update in July 1971, which would have permitted training and other preparatory requirements in conjunction with the USN and other relevant authorities.[78] However, in July 1972, the Government considered a Cabinet submission of 13 June proposing to:

> "Update the Tartar missile system and replacement of the present manual system for processing tactical information from the ship's own sensors and external sources such as other ships and aircraft by an automatic computer based system known as a Naval Combat Data System (NCDS)."[79]

Tartar was noted as being replaced by the Standard missile system, which brought the advantage of it becoming possible for the RAN to use further variants of the new system with only minor modifications to the ships. The timing of the proposal was subject to the "…current American production line for modification kits and Standard missiles."[80] The submission explained the benefit of joining the USN production run to obtain the best price for the missiles, and because the missile system was so closely related to the combat data system, it was highly desirable to install both systems at the same time.[81]

A proposal to create a "Programme Generation Centre" was included and identified a benefit of so doing as enabling adaptation of the JPTDS program to interface with the Ikara weapon system.[82] As part of the arrangements, software management of the missile system would be retained by the USN, and RAN upkeep of software would be associated only with the combat data system.[83] The associated 'Strategic Guidance' noted that the DDGs were the most modern ships in the RAN Fleet with a general purpose capability,[84] and that updating the weapons systems to keep them relevant to Australia and in step with USN logistics support

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78 Royal Australian Navy, *DDG NCDS Update - Factors and Installation Schedule. Dated 15 March 1973. (SPC.DS.17.1),* Navy File 1215/51/405 Canberra: Sea Power Centre Australia. Page 11

79 Commonwealth of Australia, *Modernisation of Royal Australian Navy's DDG's - Decision 1091(AD HOC) 13 July 1972*, Vol. NAA: A5908, 703 (Canberra: National Archives of Australia)

80 ibid page 4

81 ibid

82 ibid

83 Navy Order 285/74 established the responsibilities of CDSC. See: David Wellings Booth, Geoff Cannon and Glenn Bridgart, "Bits and Bytes," in *Memories of CDSC (Where the Navy Went to Bits)* (Canberra: Royal Australian Navy, 2009a), page 6

84 Although an Adams DDG was primarily an air defence destroyer, its range of sensors, weapons and command capabilities made it highly suitable for other missions. 'General purpose' is a term used to convey such attributes.

was a sound step to take.[85] Costs were given as A$19.957m for NCDS and A$12.690m for Tartar modifications.[86] The overall project was valued at A$33m but an initial payment of US$50,000 was required by the USN for information transfer to the RAN.[87] The 12 months' delay in obtaining government approval resulted in a progressive compression of schedules, requiring the project to continuously revise its plans for the fitting of a complex new system.[88]

Naval Project Directive 63 entitled '*Naval Combat Data Systems'* was endorsed by the Naval Board on 30 March 1973.[89] Its intent was "To provide the DDGs with a Command and Control System capable of optimising the effectiveness of their weapons and sensors throughout their remaining hull life."[90] This was the authority to undertake work and spend money in the acquisition and installation of NCDS in the DDGs and at the Australian shore based facility, which became known as the Combat Data Systems Centre (CDSC) located in Canberra. The RAN intended to build on the USN JPTDS and the Directive noted that NCDS "… is the RAN version of the USN Junior Participating Tactical Data System – JPTDS…"[91] and that:

> "JPTDS has been designed to permit gradual enhancement of the initial configuration, which is basically dedicated to Air and Surface Warfare, to a comprehensive system which will embrace Anti-Submarine Warfare. The RAN requires its ships to have a multi-purpose role and therefore has proposed that the basic JPTDS package for the DDG be enhanced."[92]

As will be seen, this aspiration was not destined to be achieved.

The technical and therefore financial risks of acquiring JPTDS were markedly reduced by the USN offering, via a Foreign Military Sales (FMS) agreement with the RAN, the complete operational computer program for JPTDS without cost to Australia, and for the JPTDS system

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85 Commonwealth of Australia, *Modernisation of Royal Australian Navy's DDG's - Decision 1091(AD HOC) 13 July 1972.* Page 4

86 ibid page 5

87 David Wellings Booth, Geoff Cannon and Glenn Bridgart, *The History of NCDS in Australia*, page 2. This was the US$50,000 deposit referred to by Rear Admiral Purcell.

88 Royal Australian Navy, *DDG NCDS Update - Factors and Installation Schedule. Dated 15 March 1973. (SPC.DS.17.1)*, page 11.

89 Royal Australian Navy, *Project Directive no 63 - Naval Combat Data System. Dated 29 May 1973. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 104) (SPC.DS.46.1),* Navy File 1626/204/415 (N) Canberra: Sea Power Centre Australia.

90 ibid page 3

91 ibid page 1

92 ibid

to be thoroughly tested in USN DDGs before installation in those of the RAN.[93] A recently (then) ratified data exchange agreement between the RAN and USN also provided access by the RAN to the 10 years' experience accumulated by the USN in its use of NTDS.[94] To become the beneficiary of such experience and intellectual property at such low cost would have made the proposal difficult for the RAN to easily dismiss. It was also an example of how the USN saw value to itself in the improved performance of the RAN's DDGs and the opportunity for enhanced interoperability this presented. JPTDS appeared even more favourable to the RAN when Defence formally assessed an alternative commercial combat data system and found that its price had almost doubled from that first estimated.[95]

The 1972 decision to proceed with JPTDS was taken with an expectation by the RAN that it would be the baseline system for all future RAN ships and submarines.[96] The DDL project was still progressing and the expectation was that CDSC would provide support to the development of that project, which the Defence Source Definition Committee (DSDC)[97] had agreed would also be fitted with JPTDS when it had rejected the commercial alternative on grounds of cost and risk. Overall, with the DDGs, DDL and Oberon submarines, there was an intention that 13 systems would be required by the RAN.[98] The submarine system was subsequently deferred[99] and ultimately a different technical solution was adopted, and the DDL project was cancelled in August 1973 following a change of government.[100] The early strategic aspiration to have a Navy-wide family of digital combat systems based on JPTDS was not achieved, but no substitute plan was developed. The adoption of JPTDS with the FFGs, however, later provided important economies of scale and effort.

Brisbane was intended to be the first ship fitted with NCDS and was to be sent to the United States where its medium calibre gun update would also be undertaken. *Perth* and *Hobart*

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93 ibid

94 ibid page 2

95 Royal Australian Navy, *DDG NCDS Update - Factors and Installation Schedule. Dated 15 March 1973. (SPC.DS.17.1)*, page 10

96 ibid

97 The DSDC had responsibilities associated with major capital procurement choices and methods of procurement.

98 Royal Australian Navy, *DDG NCDS Update - Factors and Installation Schedule. Dated 15 March 1973. (SPC.DS.17.1),* Navy File 1215/51/405 Canberra: Sea Power Centre Australia. Page 10

99 ibid

100 Commonwealth of Australia. *CPD [Reps] Vol 34, 22 August 1973.* Page 241

were to be modernised in Australia.[101] Considerations as to schedule and location of installation were complex and made more so by the lack of NCDS and digital Tartar technical expertise in Australia. As it transpired, the arrangements were ultimately changed to comply with government direction that two of the modernisations had to be undertaken in Australia, and to match ship and dockyard availability.[102] The RAN was breaking new ground and, as Newman notes: "The Naval Combat Data System (NCDS), fitted to HMAS *Perth* in early 1975, was the first installation for an Australian Armed Service of a digital computer-assisted command and control system."[103]

Early RAN Operational Experience with NCDS

Installing NCDS in Perth

With Captain Peter Hutson[104] in command, *Perth* departed Sydney and sailed for the United States on 31 July 1974 for its NCDS update, arriving in Seal Beach California on 23 August.[105] *Perth* returned to Sydney in September 1975.[106]

Operational experience during and after WWII strongly supported the development of automatic radar detection and tracking of targets, but initial USN attempts had been reported by the RAN Attaché in Washington in April 1968 as having being unsuccessful.[107] Success was eventually achieved when the USN installed its first Radar Video Processor (RVP) in *Perth*.[108] The fact that *Perth* was not part of the USN did not hinder its willingness to treat *Perth* as just another ship on the production line as it had in 1965 when *Perth* was also the first of the

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101 Commonwealth of Australia, *Modernisation of Royal Australian Navy's DDG's - Decision 1091(AD HOC) 13 July 1972,* page 2

102 Commonwealth of Australia, *CPD [Reps] Vol 34, 22 August 1973*. Page 244

103 N. Newman, *Future Australian Combat Computer Systems (Annual Engineering Conference 1976: Engineering 1976-2001)*, 322-325, page 322

104 Hutson had previously been closely involved in combat data system evolution of the DDL project.

105 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1974 to December 1974,* AWM78-292-11 Canberra: Australian War Memorial. Pages 53-71. Travel by the families of *Perth*'s ships company to the United States was not approved until 3 June 1974, which caused problems in making travel and other domestic arrangements in the remaining seven weeks before the ship departed. Long periods of family separation were considered normal by the RAN at that time, as had been undergone by personnel associated with the original acquisition of the ships.

106 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1975 to December 1975,* AWM78-292-12 Canberra: Australian War Memorial. Page 75

107 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1)* Section II - Overseas Development – Development in the USA – paragraph 62

108 Norman Friedman, *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars*, page 79

Adams class to be fitted with the AN/SPS-52 three-dimensional radar. The USN undertaking to manage all technical risk for the installation of JPTDS had relieved the RAN of much concern at that point. Purcell notes that the RAN collected data on the performance of manual trackers in trials and compared it with that obtained using the automatic features of both the RVP and BVP.[109] Automated results proved better than that achieved by the manual trackers who, after 20 minutes, were unable to sustain the effort required for effective picture compilation due to the way in which NCDS operated.[110]

Lieutenant Robert Hall was the Direction Officer of *Perth* and responsible for the operational employment of its NCDS. He observes that through its acquisition the RAN developed its own expertise in automatic detection and tracking with the RVP, and periodically loaned Lieutenant Peter Bobroff, a WEEO, to the USN to assist them in modifying the applicable software. Eventually the modified software found its way back to the RAN to the mutual benefit of both navies.[111] In 1975 Bobroff was presented with a USN Citation by Rear Admiral Maxwell Reed, Chief of Naval Technical Services, for the valuable work he did working with the USN in "…translating operational requirements into material implementation…" by means of NCDS/JPTDS software.[112] The citation is an example of the professional working relationships formed between CDSC and its USN counterparts, contributing in turn to the wider collaboration and mutual demonstrations of competence occurring at multiple levels between the two navies.[113] Such interaction owed much to the RAN acquisition of the DDGs and their later modernisation with JPTDS/NCDS.

JPTDS did not fully integrate with Ikara, which remained a stand-alone ASW weapon system, although electronic symbols representing contacts detected by the bow mounted AN/SQS-23 sonar could be displayed on the AN/OJ-194 multi-function displays (MFD). JPTDS was designed with a Quick Reaction (QR) mode of operation to assist in countering the anti-ship missile threat.[114] QR could be initiated through the detection of a sonar contact, as well as by

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109 BVP had been trialled onboard USS *Belknap* 1967 in Vietnam operations.

110 Interview with Rear Admiral Peter Purcell. Page 38

111 Interview with Commander Robert Hall, 5 September and 13 October 2011. Page 66

112 "He Taught His Teachers," *Royal Australian Navy News,* e, Vol18 No20, Page 8

113 See Appendix K for an examination of the DDGs and Exercise RIMPAC in which RAN interoperability with the USN was an important contribution to their relationship. It was initially enhanced through the DDGs.

114 Norman Friedman, *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars*, page 38

detections made by other sensors and it operated in manual, semi-automatic and fully automatic modes, which progressively decreased the time between detection of a threat and its engagement.[115] When using QR, the computer reacted to pre-programmed threat profiles and executed a pre-programmed action to control the engagement process, but it suffered from having only a basic level of integration with the ship's electronic warfare (EW) sensors. QR was to prove difficult to manage in tactically complex situations.

Initial RAN Reaction to NCDS

Lieutenant Robert Walls undertook exchange service with the RN in 1969. From his experiences in 1967 in *Hobart* with its analogue systems and USS *Long Beach* from which he had used the USN NTDS system in controlling US fighters against North Vietnamese aircraft,[116] he could compare what he found when later serving with the RN. Walls gained the impression that the RN considered they were "world beaters" in whatever they turned their hand to. But in comparison with the AN/SPS-52 radar fitted to *Hobart*, the RN equivalent, the Type 984, was much inferior. He also regarded the Comprehensive Display System used by the RN to be "stone age" in comparison with NTDS.[117] Walls remarks "After I'd seen what the Americans had and how they could use it and how they could get results with it I was very conscious of the relative inadequacies of the Brits and their equipment."[118]

On return to Sydney in September 1975, *Perth* became the subject of considerable interest as to the changes that had been made to its combat system. An early visitor was the RN First Sea Lord, Admiral Sir Edward Ashmore RN, who toured the ship on 30 September 1975 during a visit to Australia[119] and was reported as saying "I was very glad to have the opportunity to visit HMAS *Perth*…I received the impression of an alert and efficient ship…"[120] Lieutenant Commander Walls was by then the Fleet Direction Officer and observed *Perth* at sea shortly after its arrival. He recalls how much improvement there had been in the equipment, but was

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115 Royal Australian Navy, *Guide to the Modernised RAN DDG. Dated 1 July 1988. (SPC.DS.21.1),* Canberra: Sea Power Centre Australia. Chapter 3, Annex A, Page 3

116 Interview with Vice Admiral Robert Walls*,* 30 August 2011. Page 26

117 ibid page 28

118 ibid page 29

119 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1975 to December 1975*, 1-109). Page 75

120 "First Sea Lord Visits Australia," *Royal Australian Navy News,* 10 October 1975, Vol19 No19, Page 1

far from convinced that the operations room team were able to use it properly.[121] Rear Admiral Peter Purcell[122] remarks that after briefing the Fleet Commander and a number of his senior officers about NCDS, he came away with the impression that Fleet Staff had expected much more of NCDS than it was designed to deliver. He formed the opinion that the staff had not thought about the engagement cycle, which had a number of essential steps. Those steps involved processes which took time to be completed by sensors, computers and other equipment, and in turn this created operational constraints on the performance of the combat system that had to be managed.[123]

Commander Robert Hall,[124] then *Perth's* Direction Officer, highlighted the dismal results achieved by *Perth* during an air defence exercise conducted with the RAAF. Twelve RAAF F-111 aircraft carried out the raid and the "…system totally failed… it was a real eye opener for the RAN…"[125] He remarks that the aircraft attacked the ship from multiple directions but the operational software kept computing the highest threat. Due to the way the raid was conducted tactically, it overwhelmed the automated QR process which frequently changed threat priorities and missile engagement profiles, and failure ensued. Hall comments that he and his team probably did not sufficiently understand the way the system worked, and therefore were not able to change to a more suitable mode of operation.[126] Although he was not onboard for the event, Purcell considers the F-111 attack on *Perth* to have been "… a put up job."[127] He remarks "…The RAAF brought in 6[128] of them right around the compass rose…the systems are not designed to handle that. And in my briefings when I got back, I had briefed all of those who ought to have been in the know, that if that sort of thing happened, then you might knock down one or two but that was the best you could do."[129] The mismatch between anticipated performance levels of the modified DDGs on one hand, and what they could actually do on the other, implies poor communications and coordination between the respective authorities concerned and, as will be shown, this was the case.

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121 Interview with Vice Admiral Robert Walls, 6 October 2011. Page 11
122 Purcell was a Lieutenant Commander at that time.
123 Interview with Rear Admiral Peter Purcell. Page 38
124 Hall was a Lieutenant at that time.
125 Interview with Commander Robert Hall. Page 49
126 ibid page 59
127 Interview with Rear Admiral Peter Purcell. Pages 37-38
128 *Perth*'s ROP of the month does not specify how many were involved but it was later confirmed as 12 in the Total Combat System Discussion period of 17 to 19 August 1976.
129 Interview with Rear Admiral Peter Purcell, pages 37-38

Total Combat System Discussion Period – August 1976

As evident in the epigraph to this chapter, there was concern on the part of members of the RAN's Fleet Staff that after its extensive and expensive NCDS upgrade, *Perth's* demonstrated performance was much inferior to that which had been anticipated. Accordingly, a conference was held at Fleet Headquarters in Sydney from 17 to 19 August 1976 for the purpose of examining and proposing solutions to NCDS problems observed in the previous 12 months.[130] The event was arranged by Lieutenant Commander Walls[131] and its report provides an insight into the complex issues being faced by the RAN in the introduction of this important new capability which fundamentally affected the operational performance of the DDGs.

In his opening remarks, Commodore Rothsay Swan, as Chief of Staff to the Fleet Commander, noted that Fleet Staff were concerned about the performance of the NCDS DDG and said "We make no apologies for bringing you all here…The need for this discussion period is clear to us…and if it isn't already so for you, I feel sure it will be before the day is out."[132] Swan went on to remark "With regard to…NCDS…the parameters of performance are neither defined (so far as we are aware in Fleet Headquarters) nor adequately known empirically. This is a cause for concern."[133] Operational requirements for the NCDS DDG were described in the Naval Staff Requirement 21/69, but in his own opening remarks, Walls observed that they were "…too nebulous for application by the Fleet Commander."[134] Walls quoted extensively from the Staff Requirement and remarked that it did not include information associated with actual performance requirements in varying operational circumstances. He suggested that the RAN's NCDS baseline had been established by the USN JPTDS OPEVAL (Operational Evaluation), but noted that details of the USN OPEVAL were apparently unavailable to the RAN, and if they were then they had not been made available to the Fleet Commander. The only performance standards Fleet Staff were aware of were those arising from trials conducted by Peter Purcell

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130 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1)*. Covering Letter.

131 ibid. Enclosure 1 (Agenda).

132 ibid. Enclosure 3 (Opening Address by Chief of Staff) - page 1

133 ibid. Enclosure 3 - page 2

134 ibid. Enclosure 4 (Introduction by Fleet Direction Officer) – page 1

during *Perth's* modernisation: the Total Combat System Proving Trials (TCSPT) Report which encompassed NCDS and digital Tartar and the RVP OPEVAL.[135]

Walls' remarks imply that the RAN had acquired a critical operational system without full knowledge of its expected performance in practice. A submission by the Hughes Aircraft Company for the NCDS display system provided some comparative data in terms of how JPTDS could meet most of the RAN's requirements, but it related only to some technical parameters of the system and provided no indication of operational performance against particular threats.[136] Walls went on to say "Stated simply, and subjectively put, her (*Perth's*) performance has not matched that expected."[137] He painted a picture in which the NCDS DDG was less capable than the analogue DDG in some circumstances, and implied that the various areas of the Navy associated with supporting NCDS were not cohering as they might when he said "In seeking these answers we expect to traverse opinion, point and counterpoint, in a wide field already loaded with emotion, pride, politics and professional jealousy."[138]

The processes used by the RAN for matching operational requirements to technical performance were being criticised by those who had to use the end product. The remarks of Swan and particularly Walls strongly suggest that the organisational cohesion and inclusiveness necessary for the successful introduction of a new and advanced capability was absent, and this had placed the RAN at risk of operational failure. Managerial skills to effectively introduce new technologies into an existing environment where multiple interests needed alignment had not been mastered.[139]

Purcell provided summary details to the conference of the TCSPT he conducted when *Perth* was modernised in the US. He emphasised that his report had been compiled over a year

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135 ibid. Enclosure 4 – page 4

136 Hughes Aircraft Company, *Proposal for a DDG Tactical Data System for the Royal Australian Navy. Dated 31 August 1970. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 123) (SPC.DS.50.1),* 70D/C2620 Canberra: Sea Power Centre Australia. Page 1-1

137 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1)* Enclosure 4 – page 5

138 ibid

139 Major projects later became the responsibility of the then Defence Acquisition Organisation (DAO). A 1999 audit report showed a lack of formal consultation with important stakeholders at critical times still needed to be addressed as part of its business process re-engineering activity. See: The Auditor-General, *Management of Major Equipment Acquisition Projects (Department of Defence)* Canberra: Australian National Audit Office, 1999, page 114

previously using an inexperienced crew, but that because it was the only data available, it was the baseline from which performance should be improving.[140] Purcell highlighted that the TCSPT required 26 man weeks of effort to analyse and that a much more comprehensive data analysis capability was needed by the RAN for assessing the results of future trials.[141] He also noted the limited coverage provided by TCSPT results as being "…AAW[142] oriented and reflect area surveillance requirements and generally a single threat."[143] The trial results therefore provided little assistance in predicting or assessing the performance of the ships against multiple threats, including submarines.

Lieutenant Commander Christopher Skinner and Lieutenant Robert Hall gave a comprehensive overview of the results achieved by *Perth*, for which Skinner was the Combat Systems Engineering Officer and lead Fire Control Systems Coordinator (FCSC), and Hall was the lead Ship's Weapon Coordinator (SWC).[144] The SWC and FCSC were the two key leadership positions in an NCDS DDG for control of the total combat system and engagement of targets.[145] Their joint presentation included details of the differences between the analogue and digital capabilities of the DDGs and highlighted the manner in which NCDS determined the priority of a threat, and particularly the peculiarities of the QR mode, which required careful management to avoid the target prioritisation system becoming saturated as had occurred in *Perth's* exercise with the RAAF.[146] They made the point that onboard training capabilities were

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140 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1)* Enclosure 5 Total Combat System Proving Trials – (A Summary of Results) – page 1

141 ibid. Enclosure 5 – page 8

142 AAW – abbreviation for Anti-Air Warfare

143 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1),* A.F. 5/3/94 Canberra: Sea Power Centre Australia. Enclosure 5 – page 8

144 ibid. Enclosure 6 (HMAS *Perth* AAW Performance)

145 The SWC directed the total combat system including deciding the performance settings for sensors and executing the tactical performance of the ship in its role as an air defence ship. The FCSC worked for the SWC and directed the Standard missile system and guns in engaging allocated targets. The SWC was responsible to the Principal Warfare Officer (PWO), who was in turn responsible to the Command for the overall performance of the Combat Information Centre.

146 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1),* A.F. 5/3/94 Canberra: Sea Power Centre Australia. Enclosure 6 – pages 7-8

limited, that the four week duration training courses for operators in the United States had been of limited value, and added "No guidance was given how to run NCDS."[147]

Echoing Purcell's remarks concerning manual tracking problems, Skinner and Hall noted that after 30 minutes of trying to maintain a high track quality[148] operators suffered a severe degradation of performance. In analogue ships, operators could update tracks in a less intensive manner, but the NCDS software generated audible and visible prompts for operators to update the data regardless of whether they were a high threat or not, and the prompt required a physical action by the operator to prevent them being continually reminded.[149] In closing, Skinner and Hall said that the performance of the NCDS needed improvement, particularly in terms of its poor performance in its Operational Readiness Evaluation (ORE) of April 1976 and in its countering the F-111 raid of 12 May 1976. They believed they needed help and resources to solve the problems they were confronting but were "…confident that major improvements can and will be made in the effectiveness of AAW, but we consider all relevant resources should be brought to bear on the formulation of improvements."[150] Skinner and Hall gave the impression that they were frustrated that RAN action was not being coordinated effectively and as a consequence, as had also been remarked by Walls, that *Perth's* performance was not improving to the extent that it should.

Lieutenant William (Bill) Overton became the Communications Officer of *Perth* on its return to Australia.[151] Overton had the benefit of having worked at CDSC for six months before joining the ship but had not served previously in an analogue DDG. He considered that too much was expected of the system because it was a JPTDS derivative, and that NCDS did what it was designed to do.[152] Overton also remarked that when the intensity of the operational situation increased, it was not possible for two officers to fulfil all the responsibilities allotted to a

147 ibid. Enclosure 6 – page 13. The extended period of inadequate operational training for NCDS by the RAN is examined further in this chapter.

148 NCDS used a method of assigning a 'quality' to a track based on a variety of parameters. Track quality was particularly important for data link management and target engagement purposes.

149 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1),* A.F. 5/3/94 Canberra: Sea Power Centre Australia. Enclosure 6 – page 19

150 ibid. Enclosure 6 – page 32

151 ibid. Enclosure 8 (Experience as a PWO – Presentation)

152 ibid. Enclosure 8 – page 1

Principal Warfare Officer (PWO) and a SWC.[153] Overton cited the operational inadequacy of the stand-alone ASW arrangements and the problems of not having the EW system more fully integrated into NCDS.[154] EW integration into NCDS was destined never to be fully achieved, which contributed to inadequate command situational awareness and probably inhibited RAN tactical development of an increasingly important facet of naval warfare.

Lieutenant John Ridler described how NCDS software was being changed and managed, and reminded the conference that changes to operational software had to be matched with the experience of the operational staff, because in many respects they were interdependent.[155] Ridler had been the NCDS software engineer in *Perth* and noted that of three officially delivered programs, none were successfully operable on installation.[156] After *Perth* sailed from the US, the RAN became entirely responsible for its own NCDS software maintenance and there was a marked rise in the number of patches[157] requested by the ship.[158] Ridler reinforced the remarks of others seeking to ensure that NCDS issues were properly explored so action could be taken.

Contrary to what was expected by some in the RAN, Ridler noted that JPTDS had not benefited from a high degree of design quality by the USN, and emphasised the need to understand that:

> "NCDS is intended to provide a comprehensive, coherent, centralised command and control function. It has evolved from a fragmented entity with barely adequate direction and has become primarily a management problem whose solution lies in stabilising attitudes of all personnel involved with it."[159]

He commented that NCDS had become a separate entity in the RAN and that an excessive speed of development had left it in a "psychological state akin to shock" and NCDS needed to

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153 ibid. Enclosure 8 – page 2. The implications of adopting the RN fighting philosophy with a USN combat system are discussed later in this chapter.

154 ibid. Enclosure 8 – pages 4 to 6

155 ibid. Enclosure 10 (Onboard Software Patching and NCDS Software Management)

156 ibid. Enclosure 10 Part 1 – page 1

157 Patch – a term meaning a temporary change to a software program intended to overcome a fault or meet a special requirement – usually delivered to the unit outside of a formal comprehensive software updating process

158 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1),* A.F. 5/3/94 Canberra: Sea Power Centre Australia. Enclosure 10 Part 1 – pages 2-3

159 ibid. Enclosure 10 Part 2 – page 5

be nurtured and dealt with carefully.[160] Ridler made the point that "…*Perth* is the only ship carrying a HAC (Hughes Aircraft Company) designed 3D RVP…" and that it had seen few hours of operation and did not enjoy the confidence of the operators.[161] The repeated remarks concerning overloading of NCDS tracking operators should have been expected to make increasing the performance of RVP for automatic target detection and tracking a very high priority. His remarks suggest, however, that the priorities for RAN software support did not yet match the most pressing operational problems.

Ridler remarked that after a year of NCDS experience the roles of operational staff had not been delineated, and that the operations room would not function successfully until such policies were adopted and made to work.[162] He considered that the human element[163] had been neglected and commented that since its NCDS modernisation, *Perth* was receiving its third Gunnery Officer, its third Torpedo and Anti-Submarine Officer and its second Communications Officer and that the Direction Officer was about to change. Ridler suggested that the RAN was being "cavalier" in its approach to bringing into service a complex new system that required consistency of effort and growth of expertise which could not emerge while people kept changing.[164] He highlighted the nature of the modernisation of *Perth* and inferred that if the circumstances had been appreciated, the manner by which the ship had been re-integrated back into the RAN on its return from the United States might have been managed differently. Ridler remarked:

> "The Total Combat System Proving Trial was the most important event in the modernisation of *Perth*...These trials were essential …(but) for the furtherance of morale of ships personnel, for advancement of training and for breeding

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160 ibid. page 12

161 ibid. page 14

162 ibid. page 15. Overton's remarks about the work load and responsibilities of the PWO and SWC are germane.

163 The human dimension can sometimes be an understated factor of in making the best use of naval technology. The perceptions of those who had to make the DDGs work are examined in some detail in Chapter 5.

164 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1),* A.F. 5/3/94 Canberra: Sea Power Centre Australia. Enclosure 10 Part 2 – pages 15-16

> confidence among the operators they were a disaster…As a team the ship gained little but confusion from these trials."[165]

In closing, Ridler also commented on what was not known technically about NCDS when he remarked "It is universally agreed that the systems capability should be quantitatively defined. At the moment it is not known whether the system meets design specifications. In fact the design specifications are themselves not known…"[166] Without those specifications, the RAN would find it very difficult to determine the intended operational performance of NCDS and this underscores the limited information available to the RAN when it made its decision to follow the USN. But it also infers there was a general lack of knowledge by RAN decision makers concerning digital combat systems.

Conference conclusions and recommendations were developed by Fleet Staff and forwarded to the CNS. *Inter alia*, they recommended that training of operational staff needed attention and that "The provision of appropriate facilities at HMAS *Watson*, eg up-date of the AIOTT,[167] is an urgent requirement."[168] As will be shown, it was to take approximately 18 years before this urgent requirement was met.

This was an important conference which brought together a range of stakeholders to review the situation and decide upon action to overcome the troubled introduction of a significant new capability. The operational potential and limitations of NCDS were not well understood. The RAN had had no input into the operational specifications of the system or the primary physical layout of equipment as installed in the ship, all of which were formulated to USN requirements and reflected USN philosophies, not those of the RAN or RN. At this point the RAN had not developed a combat system philosophy or doctrine connected to a higher order statement of naval principles, and a lack of coherence in operational evolution is evident. As

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165 ibid. Enclosure 10 Part 2 – page 16

166 ibid. pages 17-18

167 AIOTT – abbreviation for Action Information Organisation Tactical Trainer: a shore based facility housing equipment used for the training of operational personnel in varying degrees of complexity.

168 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1),* A.F. 5/3/94 Canberra: Sea Power Centre Australia. Enclosure 17 (Fleet Staff Conclusions) – page 2

we have seen, the RAN was to take another 24 years to publish its first indigenously developed Maritime Doctrine.[169]

Electronic Warfare Capabilities

Not only were the EW capabilities of the DDGs not fully integrated into NCDS, they were not of an advanced technological standard when the analogue ships were acquired in the mid-1960s. The detailed report of the USAF attack on *Hobart* painted a generally poor picture of all RAN EW capabilities in providing defence against anti-ship missiles, and noted that the AN/ULQ-6 missile decoy equipment fitted to the DDGs was often unserviceable.[170] Captain David Cotsell considers that the initial EW capabilities of the DDGs were no more advanced than those fitted to the RAN River class.[171] When NCDS was installed in *Perth*, Cotsell contends that the capabilities of the EW sub-system remained dated, and that the development of EW equipment in the USN lagged behind the capability of other sensor systems, a situation not remedied until development of AN/SLQ-32. He notes "…the (DDG) system itself was an electromechanical system so it was quite obsolete and required a lot of manual interaction. That was two generations behind where NCDS was, even when it started."[172] Cotsell remarks that he and his EW sailors in *Perth* developed the RAN doctrine for manual integration of the information in the EW sub-system into NCDS in a manner that complemented the other data inputs being used to compile the overall tactical picture.[173] That there was no EW doctrine available from the USN for JPTDS provides further indication of USN DDGs having lesser importance in the USN order of battle than those of the RAN.

USN Combat Data System and the RN PWO Fighting Doctrine

The original layout of the NCDS DDG C-I-C had been designed by the USN in the late-1950s and this occurred while RAN seaman sub-specialist officers were being trained via the RN Long Course scheme. RN Principal Warfare Officer (PWO) training had replaced the RN Long Course method in 1972[174] after the RN had conducted a comprehensive simulation and then major

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169 Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2000*, 1st ed. Canberra, ACT: Defence Publishing Service, 2000

170 Royal Australian Navy, *Accidental Attack on HMAS Hobart by US Aircraft in Vietnam Waters (SPC.DS.20)*

171 Interview with Captain David Cotsell*,* 8 January 2013. Page 13

172 ibid page 11

173 ibid page 10

174 G. MacKinnell, "The SWOC - Australian Trained PWOs," *Journal of the Australian Naval Institute,* 11, 1, 1985, 45-46, page 45

live training exercise with the British Far East Fleet in 1970.[175] An 11 ship RAN task group led by *Melbourne*[176] also participated in the five nation exercise known as 'Bersatu Padu', in which the PWO concept of fighting was trialled.[177] Concurrently, *Hobart* was part of the USN 7th Fleet conducting offensive bombardment operations in Vietnam.[178] In December 1974, Lieutenant Cotsell was posted from training in the UK, where he had qualified as a PWO, to join *Perth* in the US.[179] In its December 1974 ROP, *Perth* reported "The third and final NCDS training course completed on 19 December 1974. As a result of these courses, all the Operations Room watchkeeping Officers and all Radar Plot sailors onboard have received NCDS training."[180] Cotsell's arrival was acknowledged in an Annex to the ROP.[181] The Gunnery Officer, Lieutenant Geoffrey Morton, was recorded in the February 1975 ROP as having joined *Perth* on 10 January 1975,[182] but Morton completed NCDS training in Australia at CDSC where he underwent one of the first courses conducted at the Centre and was able to receive personalised and individual instructional support.[183]

Cotsell's PWO training had a strong focus on producing officers competent to be the watchkeeping warfare officer in an RN Leander class frigate,[184] but his role in *Perth* was to be a watchkeeping SWC: a position that required knowledge and experience that Cotsell did not yet possess. On arrival in *Perth* he found that NCDS training funds had already been expended and that he, with assistance of ship's staff, had to teach himself how to use NCDS. Cotsell was the

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175 Royal Australian Navy, *Warfare Officers Career Handbook*, ed. Naval Warfare Advisory Council Canberra: Royal Australian Navy, 2006, page 33

176 "Big RAN Entry in Singapore," *Royal Australian Navy News,* 29 May 1970a, Vol13 No11, Page 1

177 Royal Australian Navy, *Warfare Officers Career Handbook*, page 33

178 "Hobart's Guns Wreak Havoc on Viet Cong," *Royal Australian Navy News,* 29 May 1970b, Vol13 No11, Page 1

179 Interview with Captain David Cotsell. Page 8

180 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1974 to December 1974*, page 100

181 ibid page 101

182 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1975 to December 1975*, page 7

183 Personal Communication from Commodore Geoffrey Morton, 16 March 2014. email.

184 Australian PWO training was not transferred from the UK to Australia until 1985. G. MacKinnell, *The SWOC - Australian Trained PWOs*.

first and only PWO trained officer in *Perth* at that time, with all other seaman sub-specialist officers having completed RN Long Course training.[185]

Having only commenced in 1972,[186] by 1974/75 the PWO doctrine was still relatively new, and Cotsell felt that his training was not universally viewed by Long Course trained officers to have been at the same professional level.[187] A later RAN explanation for the change of training doctrine noted that "Warning time did not allow ships the luxury of going to 'Action Stations', which was past practice and which allowed the relevant specialist officers to be at their stations and ready to fight…multi-skilling of officers became necessary…"[188] Cotsell remarks that he tended to put the NCDS system into the automatic QR mode, which he considers the most appropriate way of dealing with short range surprise attacks, but he didn't think that Fleet Staff would have agreed with him.[189] Cotsell comments on having no time to react - a reference to his own experience in Vietnam, where he was in the C-I-C of *Hobart* when the ship was hit by three Sparrow missiles fired from a USAF aircraft.[190] He remarks that whenever he was in his role as a PWO he was fundamentally suspicious of any track that could not be positively identified as friendly.[191]

Commander Ian Pfennigwerth commanded *Perth* in 1983, approximately eight years after its NCDS conversion. He opines that the C-I-C layout was functionally inadequate, and that it was not ergonomically as well organised as in a Type 12. The lack of integration of the sonar and EW was unsatisfactory and made it "…a bloody hard place to work in."[192] Pfennigwerth acknowledges that it would have been expensive to change but he was surprised that the C-I-C consoles were not organised more logically when they were installed.[193] Lieutenant

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185 The RAN followed the RN officer training model. Prior to 1972 officers were trained as sub-specialists in the seaman branch. Each sub-specialist officer had responsibilities for controlling the fighting of a sub-department in the ship. This was colloquially known as becoming 'Long Course qualified' and was an important milestone in a seaman officer's career.

186 G. MacKinnell, "The SWOC - Australian Trained PWOs," *Journal of the Australian Naval Institute,* 11, 1, 1985, page 45

187 Interview with Captain David Cotsell. Page 8

188 Royal Australian Navy, *Warfare Officers Career Handbook*, page 33

189 Interview with Captain David Cotsell. Page 36. Inadequate understanding of the QR mode was a factor contributing to *Perth*'s unsatisfactory performance on return to Australia.

190 Cotsell was awarded a Naval Board Commendation for his service in *Hobart* during its Vietnam tour. "Vietnam Awards Presented at Garden Island," *Royal Australian Navy News,* 21 March 1969, Vol12 No6, Page 3

191 Interview with Captain David Cotsell. Page 39

192 Interview with Captain Ian Pfennigwerth, 26 July 2012. Page 47

193 ibid

Commander Antony Anderson was the WEEO of *Perth* when Pfennigwerth was in command and assesses that the C-I-C was not working: "…it was a disaster area."[194] He adds that "… to some degree…people were still slow to understand the complexities…the interaction and the advantages of an integrated system, because…you have to make a very big shift…to a concept where this is all happening and I can only veto it, or I need to only veto it." He continues, referring to the QR mode of operation "… it took a long time for people to get to understand how it's supposed to work…"[195] NCDS had been in service with the RAN since 1975, but in 1983 Anderson considers that those officers who used the system operationally were still not skilled in its use.[196] The opportunities for relevant training in 1983 were still limited because improvements to the AIOTT training simulator recommended as being urgent by the Fleet Commander in 1976 had not yet been made.

The remarks of Overton, Cotsell, Pfennigwerth and Anderson highlight the differences in doctrine between the USN and the RN. As remarked by Ridler, when the NCDS update occurred, there was no RAN doctrine or organisational structure which defined responsibilities within and functional relationships between personnel who manned the C-I-C. *Perth* was using a combat data system that had been designed around USN doctrinal concepts of command and warfighting, while the RAN had adopted the RN PWO doctrine which applied different concepts for the same purpose. The outcome being that the RAN had to develop a hybrid arrangement for working around problems of C-I-C coordination and management. The terms 'SWC' and 'FCSC' were not recognised in the PWO doctrinal nomenclature adopted by the RAN, which instead used the RN terms Anti-Air Warfare Officer and Missile/Gun Director Blind respectively in its non-USN-origin ships. Other USN terms adopted for RAN use by C-I-C sailors in the DDGs (and later the FFGs) were comparably different from those in use in its RN-origin ships.

By 1983, all of *Perth*'s warfare officers were qualified PWOs who had been trained by the RN. The RN PWO fighting doctrine integrated the responsibilities of operations room personnel with how it designed its equipment and its functional layout in the operations room, which was not possible in the C-I-C of RAN DDGs. The situation was an unavoidable consequence of

194 Interview with Commander Antony Anderson, 24 August 2012. Page 32
195 ibid page 34
196 ibid

the RAN's dependence upon the RN for its fighting doctrine and upon the USN for the technical solution through which it had to be implemented.

The USN sought to make maximum use of automation in its combat data systems, whereas the RN preferred to give the user greater freedom of choice. Lieutenant Richard Menhinick underwent exchange service with the RN in 1988 after having completed the RAN PWO course, and he considers that the Type 42 ADAWS[197] system was better than NCDS in some aspects, but worse in others. He thought ADAWS a much more flexible system than NCDS if the user took the time to learn how to use its various modes of operation and remarks that "…you could actually do a lot with ADAWS that you couldn't do with NCDS."[198]

The RN philosophy was to train its officers extensively, and the combat data systems they employed reflected its intent to utilise automation in a manner which corresponded to its doctrine. USN officers underwent a course of about three months to become qualified as a Tactical Action Officer,[199] compared to the RN PWO course of about seven months.[200] The difference in warfighting training between the RN and the USN officer with similar responsibilities in a DDG was therefore considerable.[201] Further, the fulfilment of the roles of warships was also accomplished through different operating concepts. As we have seen, in the USN its DDGs were not as central to its order of battle[202] as they were to the RAN,[203] and this also resulted in dissimilarities in turn of how the two navies employed and operated their ships.

The previous analogue DDG combat system arrangement had provided the Commanding Officer with a seat at a 'command desk' which overlooked the interior of the C-I-C. Control of

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197 ADAWS – abbreviation for Action Data Automated Weapon System – the RN combat system. A Type 42 was a guided missile destroyer in service with the RN.

198 Interview with Commodore Richard Menhinick, 12 July 2012. Page 13.

199 Michael Harrison, "Warfare Training in the UK: Is it the Best Option?" *Journal of the Australian Naval Institute,* 8, 4, 1982, 29-36, page 32

200 Royal Australian Navy, *Warfare Officers Career Handbook*, page 33

201 For a discussion of the differing philosophies of the RAN, RN and USN as to how officers were trained to meet the operating concepts of each Navy see: "Specialize Or Not? Former RAN CO's Reflections on Surface Warfare Development (Rear Admiral James Goldrick, RAN Rtd)," Centre for International Maritime Security, http://cimsec.org/specialize-former-ran-cos-reflections-surface-warfare-officer-development/13305

202 United States Navy, *Records of the Bureau of Ships* Box 42 Folder C-DDG2class/9320 1/1/60. Memorandum: for Chairman Ship Characteristics Board Ser 044P93 dated 15 June 1960 (NTDS in Destroyers)

203 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Letter Burrell to Burke dated 18 November 1960

the C-I-C and advice to the Command on fighting the ship rested with an officer known as the Evaluator,[204] a role that had existed in the RAN DDGs since their acquisition, including in Vietnam operations. But Vietnam was a conflict primarily having a single threat dimension, not a continuous 24 hour multi-threat environment with which the ships later had to be capable of dealing. In 1973, two years after the DDGs were withdrawn from Vietnam operations, the need to become more independent and innovative in tactical development had been recognised by the Fleet Commander, Rear Admiral Dovers. In his Haul Down report, Dovers noted:

> "…The tactical use of missiles and the requirements of anti-missile defence have also added a new and vital dimension to the tactical environment. It has been necessary to change our posture from one primarily concerned with ASW, to a more general offensive and defensive posture suitable to the multi-threat environment…Our efficiency and capability in Electronic Warfare, both active and passive, is a critical factor."[205]

In the analogue DDG, visual presentation of the tactical situation to the Command was via large perspex or magnetic boards with symbols drawn or moved by sailors responding to information relayed via internal communications from those operating radar screens or other sensors. This was largely the method used at the end of WWII. Such pictorial representations of where the enemy and friendly units were located suffered from being always "…deficient in real time, completeness and accuracy …viewing all the data available is virtually impossible due to plot sitings which are necessary for manual operation."[206]

In the NCDS DDG, tactical information was distributed to operators of AN/OJ-194 multifunction consoles by various pieces of combat system equipment, where it was then shown via electronic symbology on a radar screen and corresponding visual display units. The Evaluator

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204 United States Navy, *USS Robison (DDG-12) CIC Standing Operating Procedures - OPINST P05400.2. Dated 9 December 1961. (SPC.DS.16.1)* Canberra: Sea Power Centre Australia. Chapter 6, page 1.

205 Royal Australian Navy, *Haul Down Report of Flag Officer Commanding HMA Fleet: Rear Admiral W. Dovers RAN. Dated 22 January 1973. (SPC.DS.38.1),* Navy File 1/26/10 Canberra: Sea Power Centre Australia. Page 2

206 Department of Defence (Australia), *Naval Combat Data System Evaluation Report and Financial Statement Volume 2 - RAN Combat Data System - (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 116) (SPC.DS.47.1),* Paper: NCDS/28 April 1971 Salisbury South Australia: Department of Supply Weapons Research Establishment Salisbury; Sea Power Centre Australia. Paragraph 1.2

role was replaced by a combination of the SWC and PWO, but there were no large screen computer displays to replace the plotting boards. To be tactically aware, the PWO and Command both needed access to a multifunction console since, without access to the combat data system, they had no other way to monitor the situation in detail or take action in a timely manner. The lack of NCDS integration with the sonar system and Ikara meant that the ASW battle had to be managed via the vintage analogue electro-mechanical/optical NC-2 plotting table, first fitted on construction of the ships. Dealing with ASW matters required the Command and PWO to move away from their multifunction consoles to become involved. Neither the role of Command nor of the PWO as conceived by the RN and used by the RAN had been built into JPTDS, resulting in the PWO and SWC becoming overloaded, as was remarked upon by Overton during the Fleet conference. This circumstance gave rise to the subsequent development of RAN compromises to solve the problem and alter how some responsibilities were allocated and performed.

Pfennigwerth is critical of the way that the Fleet Staff assessed the performance of *Perth* in its work up in 1984, which he considers was evaluated as if it had not been modernised.[207] In his view, Fleet Staff were not attuned to the modern way of operating ships such as *Perth* in the complex multi-threat environment in which it had to fight. He remarks that when the ship underwent its operational readiness evaluation, the Fleet Staff applied the normal range of simulated damage which progressively reduced the capability of the ship to fight. Pfennigwerth had decided that in such an event he would transfer command to a person located in a small and separate compartment in the ship where commanding and fighting it in a much reduced manner was possible. In his view the Fleet Staff did not know such a capability existed, and were less than pleased that he had not applied the conventional methods utilised in other ships.[208] Pfennigwerth links the organisational messiness of mixing RN and USN doctrines to the creation of a dysfunctional arrangement which contributed to him not being able to fulfil his command role properly.

The recommendation by Dovers in 1973 to adapt to a new way of fighting had not been fully implemented over a decade later, and officers of Pfennigwerth's era still had to deal with the

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207 Interview with Captain Ian Pfennigwerth. Pages 48- 49

208 ibid

situation. Pfennigwerth remarks "I failed but the ship passed."[209] He was not the only Commanding Officer of an NCDS DDG who recognised that the fighting of the ship needed to be conducted differently. Commander Donald Chalmers was Pfennigwerth's predecessor and recalls a visit to the ship by the Fleet Commander, Rear Admiral Michael Hudson. Chalmers recounts that Hudson went to the bridge and sat in the Captain's chair. Hudson was invited to be on the internal communications circuit but declined on the expectation that the officer of the watch (OOW) would keep him informed. Chalmers told him that this wasn't possible because the OOW was also on a communications circuit and didn't have time. Hudson eventually went in to the C-I-C from where Chalmers was exercising command. When Hudson left a few days later, he said "I now understand how different it is." Hudson then added "What I have difficulty with is that if you sit down in the Ops Room and you never identify yourself and anyone speaking on that open circuit doesn't seem to identify themselves." To which Chalmers replied "No, that's because we've been together for over a year and we all know each other's voice."[210] Chalmers' assessment was that Hudson, who had trained as a Long Course Navigating Officer, as had Chalmers, had not made the transition from the pre-digital computer age to those methods applicable to NCDS ships in a multi-threat environment. Hudson had commanded *Brisbane* in 1974-75, but before it was fitted with NCDS.[211]

Overcoming the time lag in presenting information upon which decisions could be made was a primary consideration in adopting computers to assist the command, but it was the synthesis of tactics, processes and procedures aided by communications and equipment which linked it all to the people who made decisions that led to improved outcomes. By the early 1970s the RAN's warfighting doctrinal philosophies had changed. The USN had developed its concepts for JPTDS in the early 1960s which mirrored a Fleet operating concept different from that of either the RAN or RN. NCDS capabilities as applied by the RAN in the DDGs were neither entirely RN nor USN. RN doctrinal fighting methods were preferred, but the technical means of implementation was through a USN system, and required the RAN to develop its own procedures. This included allocating a console to the PWO, and periodically also to the

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209 ibid

210 Interview with Vice Admiral Donald Chalmers, 8 February 2013. Page 15

211 Sea Power Centre Australia, *The Navy List September 1974* Canberra: Department of Defence (Navy), 1974. Page 155. Hudson and Chalmers became CNS and CN of the RAN in 1985 and 1997 respectively. See: David Stevens, ed., *The Australian Centenary History of Defence: The Royal Australian Navy*, Vol. III Melbourne: Oxford University Press, 2001, page 312

Command, which replaced one or two other positions and increased the work load for sailors who were conducting detection and tracking elsewhere. An RAN Advisory Council was formed in 1995 to bring focus to the personnel and equipment issues confronting its warfighting Branch so that it could blend the mixture of RN, USN and RAN methods to match the doctrinal and technical capabilities that defined its responsibilities.[212]

Applying the lessons of working around the hybrid arrangements of the DDG experience seemed to take the RAN a long time. By the mid-1990s, in a new class of ships constructed in Australia to an RAN requirement and fitted with a Swedish digital combat management system, the Anzac frigate operations rooms[213] were still not designed to incorporate the lessons learned from the DDGs. Commodore Richard Menhinick notes that when he commanded *Anzac* he used his DDG experience to rearrange the way the Operations Room was configured, which he believes contributed to the changes subsequently made to the ships of the class during their major modernisation.[214] By 2013, the RAN would modify the Anzac class to integrate more effectively its organisational warfighting doctrine to the physical layout of operations room equipment, and thereby enhance the ability of the command to appreciate the tactical situation. In 2014, in the modernised Anzac HMAS *Perth III*, it was reported that "The information now displayed and available to the command through a layout which was designed as a result of significant industry input and detailed DSTO[215] analysis far better meets the requirement to actually fight the ship based on all this sensor information."[216] The Commanding Officer of *Perth III*[217] was reported as saying "Compared to when I was in command of HMAS Parramatta (an unmodified Anzac class frigate) a few years ago I now have an exponential appreciation of the tactical situation…"[218] Thus the RAN had eventually found a means to match its operational fighting doctrine with its technical solutions.

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212 "Warfare Gathering," *Royal Australian Navy News,* 27 January 1995, Vol38 No1, Page 3

213 Anzac frigates used the RN-origin term 'Operations Room' instead of adopting use of the C-I-C terminology used in its UN-origin ships.

214 Interview with Commodore Richard Menhinick, 12 July 2012. Page 32

215 DSTO – abbreviation for Defence Science and Technology Organisation

216 Katherine Ziesing, "Daring and Perth: Ops Rooms and Upgrades," *Australian Defence Magazine,* 22, 3, March 2014, 14-20, page 16

217 Captain Lee Goddard, RAN

218 Katherine Ziesing, "Daring and Perth: Ops Rooms and Upgrades," *Australian Defence Magazine,* 22, 3, March 2014, page 16

RAN Operational Training for NCDS

Construction commenced on a new Tactical Trainer Building (TTB) at HMAS *Watson* in Sydney in late 1971. Occupancy of the building for training purposes was expected to occur by the end of 1972[219] with the facility costing $3.2m, with equipment to be installed costing in the order of a further $8.5m.[220] The purpose of the trainer was reported as being:

> "…to train operations room personnel in the most efficient use of their ships and weapons …and command and control officers in decision making, formulating and evaluating tactics, and coordinating naval operations…It will contain replicas of ships' operations room and cubicles representing ships, submarines or aircraft in which personnel can carry out tactical exercises and training."[221]

The NCDS project had also made provision for the training of naval operational and maintenance personnel at CDSC,[222] located at Fyshwick, a suburb of Canberra. It was sited there primarily because of its proximity to the naval staff, technical and administrative sections of the NCDS project, and the weapon systems integration authority for development of the DDL.[223] The Project Directive for NCDS recognised the value of being proximate to the Tactical and other naval schools and to the naval dockyard to facilitate ship access and training for ship and dockyard personnel, but they were considered less important in the choice of location.[224] One consequence of that choice being that personnel who had families and were training for DDG operational or technical responsibilities were required to commute to Canberra (typically from Sydney), unless their training was longer than 12 months when a family removal entitlement existed. The facility at CDSC was not electronically connected to *Watson* and had only a limited simulation environment. At *Watson* there was, albeit in analogue form, the ability to train ships' teams in a multi-ship task group environment involving varying degrees of difficulty. In 1973, at the same time as the NCDS Project was being implemented and Canberra had been decided on as the location to train NCDS operational personnel, the outgoing Fleet Commander remarked that "It is important that we make better progress in developing our

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219 "Heavy Planting Task to Aid Trainer Scheme," *Royal Australian Navy News,* 12 November 1971, Vol14 No23, Page 1
220 ibid
221 ibid
222 Royal Australian Navy, *Project Directive no 63 - Naval Combat Data System. Dated 29 May 1973. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 104) (SPC.DS.46.1)*, page 4
223 ibid pages 2-3
224 ibid page 3

own tactical philosophy. We are still too dependent upon the tactics developed by our major allies whose circumstances are somewhat different from our own."[225] But the dislocation of CDSC from *Watson* contributed to preventing the actual capabilities of the RAN's most advanced ships being integral to the development and simulated testing of RAN tactics, which instead were performed in a largely theoretical context.

Lieutenant Cotsell was posted from *Perth* to the then not yet NCDS updated *Hobart* as its Gunnery Officer. Although he was responsible for operational performance, he arrived without any training on the gun or missile systems. Cotsell remarks "…I had four DDG postings, two pre-NCDS, two post. Apart from NCDS-specific courses, I've never received a day's training on DDG specific stuff."[226] The training of EW sailors for DDGs was also on-the-job, because the training equipment at *Watson* for the ship's EW equipment was only a cardboard mock-up of the AN/WLR1 until the AN/WLR1H was introduced through the later DDG Upgrade program.[227]

The first RAN Perry class FFG *Adelaide* was expected to commission in November 1980. On 23 August 1979 the Minister for Defence, Mr James Killen, announced that an improved simulation capability would be provided at *Watson* for FFG and DDG tactical operations training.[228] The same article reported that a $487,976 contract had been let to EMI Electronics of South Australia for the first phase of the associated simulator project.[229] Self-help was evident in 1985 at *Watson* to assist the training of personnel in the use of AN/OJ-194 displays as fitted to DDGs and FFGs, and an emulator[230] was constructed from commercially available equipment using engineering support from Thorn EMI contractors and programming support from CDSC. A full NCDS training facility was being planned for eventual location at *Watson*,

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225 Royal Australian Navy, *Haul Down Report of Flag Officer Commanding HMA Fleet: Rear Admiral W. Dovers RAN. Dated 22 January 1973. (SPC.DS.38.1)*, page 2

226 Interview with Captain David Cotsell. Page 31

227 Personal communication from Captain David Cotsell, 22 May 2014,email, page 3

228 "Adelaide Commissions on Nov 15," *Royal Australian Navy News,* 17 October 1980, Vol23 No18, Page 2

229 ibid

230 An emulator replicates the performance of equipment but is not manufactured to the same precise design or appearance; hence an emulator is not a full simulator.

but the equipment at that time was being used by the DDG Modernisation project at CDSC to support that project.[231]

The final phase of what had become a $26m project at *Watson* was completed in mid-1988,[232] but until then the only ship C-I-C model available for DDG training was the obsolete analogue version. It was reported that the new facility "…enables the training of NCDS operators, previously conducted at CDSC to be co-located with other training programs at WATSON."[233] This model was not, however, of the same configuration as in the newly further modernised DDGs (discussed later in this chapter), for which a separate $9.5m contract was let in late 1990 with British Aerospace Australia "… for the supply of simulation equipment for the tactical training of the crews of the RAN's three modernised guided missile destroyers…"[234] The new facility was due to be completed in early 1994,[235] five years before *Perth* was due to decommission, and three years after the modified *Brisbane* had returned from the first Gulf War.

Australian shore-based facilities for the training of DDG operational personnel were inadequate for most of the service lives of the ships. Such training had to be primarily conducted in an ad-hoc manner onboard the ships themselves, introducing the potential for deterioration of knowledge and professional standards through the lack of competent oversight and management of training content and delivery. Although accorded a high priority by the Fleet Commander in 1976, resource constraints appear to have prevented the AIOTT being accorded the funding importance necessary to ensure congruence with the equipment fitted in ships. The same truncated approach as had been taken in Cotsell's case had affected seaman officers generally when the DDGs were first commissioned.[236]

The submarine community adopted a different philosophy in supporting the training of its personnel. Whilst it had also decided that the training of their command teams in a shore facility was of fundamental importance, unlike its surface warfare counterparts which had to

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231 "New Combat Training Aid for WATSON," *Royal Australian Navy News,* 4 October 1985, Vol28 No18, Page 5

232 "Model Upgrade for FFGs," *Royal Australian Navy News,* 5 August 1988, Vol31 No15, Page 2

233 ibid

234 "Training Facility Upgrade," *Royal Australian Navy News,* 18 January 1991, Vol34 No1, Page 2

235 ibid

236 Robert Walls considered that technical officers of the initial commissioning crews of the DDGs in the 1960s received far better training on the equipment fitted to the ships than seaman officers did. Interview with Vice Admiral Robert Walls. Page 16

use facilities at CDSC in Canberra, it located its Command Team Trainer proximate to its primary users in the new *Watson* Tactical Training Building (TTB) in Sydney. The trainer was designed to support command team training for the Oberon class submarines, and was handed over to the Navy on 21 July 1975.[237] Almost three years later, the US Singer Corporation handed over the first of eight Submarine Fire Control Systems for the improved Oberon combat system which was an important element of the overall Submarine Weapons Upgrade Program (SWUP). The installation was to be used "… to allow submarine Command teams to train on the system."[238] Mr Andrew Johnson was a civilian engineer intimately involved with SWUP. He observes that the submarine community felt very strongly about controlling their own destiny, and thus they did all they could to avoid finding themselves in the situation they perceived the surface community had created for itself, and which they believed had apparently resulted in its lack of independence from the USN.[239] The development of a digital combat system for RAN submarines therefore took place over a comparable period of time to that involved in acquisition of DDG NCDS. But unlike with NCDS, it was managed in the RAN by those personnel who had a much closer connection with those who were to use it. Johnson recalls that the decision to adopt a US solution was the outcome of internal disagreement between some RAN submariners who retained a strong RN allegiance and favoured its new electric Mk24 torpedo, versus those who had a higher regard for the USN Mk48 torpedo powered by Otto fuel, which was selected.[240] As was the case with the DDGs, the choice of guided weapon for the submarines strongly constrained the choice of the combat data system to one that fully exploited its capabilities, and the US Singer Corporation was chosen. When delivered, its performance was so advanced that the USN took great interest in the capability of the modernised Oberons.[241]

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237 "SCTT - A Major Step Forward in the Training of Submarine Command Teams," *Royal Australian Navy News,* 1 August 1975, Vol18 No15, Page 7

238 "O-Boats Enter the Computer Age," *Royal Australian Navy News,* 20 October 1978, Vol21 No18, Page 3

239 Interview with Mr Andrew Johnson, 17 December 2012. Page 5

240 ibid page 9

241 ibid page 11

Managing Software Controlled Combat Systems

Combat Data Systems Centre

As we have seen, the Program Generation Centre approved by the Government as part of the NCDS acquisition[242] became known as the Combat Data Systems Centre (CDSC).[243] Fully supporting NCDS through a USN support agency via a Foreign Military Sales (FMS) support Case was an option,[244] but the RAN was very committed to having its own capability. Rear Admiral Purcell recalls that Commander Brian Spark was influential in ensuring that a combat systems support centre was given a prime place in the overall project to acquire NCDS for Australia. He also recalls that the means of how NCDS would be supported in Australia was the subject of debate in the Department of Defence. The cheapest option was support by the USN,[245] but Spark as the Project Director for NCDS was adamant that this would be unsatisfactory and the RAN would lose control of its ability to change the software to meet its own requirements.[246]

Commander Brian Spark[247] was a former RN officer who had had previous experience with such systems. He was strongly of the belief that the support centre was fundamentally important because the RAN must bring itself up to date with the technology, and if necessary the ships could be fitted later.[248] Spark became the first Director of CDSC and held the position from December 1971 to July 1974.[249] Lieutenant Commander Ormsby Cooper became the first

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242 Commonwealth of Australia, *Modernisation of Royal Australian Navy's DDG's - Decision 1091(AD HOC) 13 July 1972*

243 Geoff Cannon, "Technology Transfer, Knowledge Partnerships and the Advance of Australian Naval Combat Systems," in *The Navy and the Nation: The Influence of the Navy on Modern Australia*, eds. John Reeve and David Stevens (Crows Nest, N.S.W.: Allen & Unwin), pages 250-251. The Term 'System' became the plural 'Systems' after the FFGs were acquired. See: David Wellings Booth, Geoff Cannon and Glenn Bridgart, *The History of NCDS in Australia*, page 3.

244 An FMS support Case is negotiated with the US Government to support goods and services separately acquired from the US. It is managed as a discrete contractual obligation. The word 'Case' is part of the nomenclature. The RAN did not fully appreciate this circumstance when it first acquired the DDGs. See: Royal Australian Navy, *ABR 5296 - DDG Follow on Support Manual (SPC.DS.28)* Canberra: Sea Power Centre Australia, 1978, paragraph 0102.

245 Through an FMS support Case.

246 Interview with Rear Admiral Peter Purcell. Page 29

247 Spark was a member of the Executive Branch in the rank of Commander and had qualified as a Direction Officer. He was on the RAN Emergency List of Officers. See: Sea Power Centre Australia, *The Navy List September 1971* Canberra: Department of Defence (Navy), 1971 Page 25

248 Interview with Rear Admiral Peter Purcell. Page 29

249 David Wellings Booth, Geoff Cannon and Glenn Bridgart, *Bits and Bytes*, page 20

Head of the Systems Engineering Group at CDSC,[250] and in that capacity travelled to the United States and witnessed *Perth* being updated. During visits to Washington, Cooper also met with Captain Eric Swenson USN and agrees with Purcell that his influence had gained a very good deal for the RAN. Cooper notes that neither he, Captain Phillip Kennedy[251] nor Mr Tony Bone[252] had the experience necessary to create CDSC fully at the beginning, but it slowly came together.[253] Cooper also observes how the cooperation between the USN and RAN was of a very high standard, in part due to the enthusiasm of Swenson and his ability to solve bureaucratic problems.[254] Captain Christopher Skinner had DDG experience as a WEEO in both the analogue and digital configurations and remarks that CDSC was a great success, as was the Submarine Weapons System Centre (SWSC) at *Watson*, as well as the RAAF Orion P3[255] support centre in South Australia.[256] The high degree of independence gained by the submarine arm in the development of its Oberon class combat system was lost with the Collins class, which adopted a contractor-provided methodology.[257]

Implications of Multiple Combat Systems

The importance of CDSC became more obvious as RAN understanding of how to manage the change of its NCDS software matured and the associated operational and technical disciplines grew in experience. Cooper had spent a year working on the requirements and options for a small ship combat data system intended for the RAN River class, then in 1978 was given the task of investigating how the RAN was managing its operational software and making recommendations to CNS for its improvement. Cooper comments that he found some resentment in the different naval communities about his enquiries. He detected that each

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250 Interview with Commodore Ormsby Cooper, 18 October 2011. Page 2

251 Kennedy was the Director of CDSC and later retired as a Rear Admiral.

252 Later became the Director of CDSC

253 Interview with Commodore Ormsby Cooper, 18 October 2011. Page 5

254 ibid page 7

255 The modernised RAAF P3 Orions were equipped with the USN Link 11, which enabled data link interoperability with the DDGs and FFGs, and other units so fitted.

256 Interview with Captain Christopher J. Skinner, 1 February 2013. Page 23.

257 ibid. Issues associated with the Collins class combat system are addressed in several entries in: Peter Yule and Derek Woolner, *The Collins Class Submarine Story: Steel, Spies and Spin* Port Melbourne, Vic.: Cambridge University Press, 2008. Skinner was critical of the contractor model because the synergies possible by integrating the different professional backgrounds were no longer present.

naval group - the submariners, Fleet Air Arm, minewarfare and surface warfare - were all behaving as independent organisations with little interaction between them.[258]

In Cooper's opinion, the general level of understanding of operational software by the RAN was low, and its management was not well thought out. His report incorporated 116 recommendations but he was also of the opinion that members of the CNS Advisory Committee (CNSAC) did not understand what he was telling them, and the report essentially fell on stony ground.[259] Johnson also comments that there was no overarching functional control of or coordination between CDSC and SWSC, and he found that people in the two organisations would more readily exchange information with "…the UK or USN than they would between the two groups."[260] An overarching Navy framework or strategy to guide further evolution and investment in RAN combat systems was missing, with consequential duplication of effort and lack of efficiency.

The Minister for Defence, Mr Killen, announced on 25 February 1982 that Australia would purchase HMS *Invincible* as a replacement for *Melbourne*, which would be retired from service as soon as practicable. In *Navy News* it was reported that "INVINCIBLE's command data system was fully compatible to those fitted to the RAN's guided missile destroyers, P3C Orion aircraft and planned for the RAN's guided missile frigates…but the question of whether to retain the SEA DART air defence missile system would be the subject of a study."[261] The RN combat data system in *Invincible* was not the same as NCDS fitted to the DDGs but was 'compatible' in the sense that data could be exchanged via Link 11, which was common to both. In practice, software and engineering support for the RN system would have required an equivalent to CDSC unless it was undertaken via contract with the RN, or commercial arrangement. Cooper advised Captain Oscar Hughes, Project Director for the Replacement Aircraft Carrier Project, that he would have to set aside a considerable amount of money to convert the RN combat system and put in the RAN DDG system, because the experts in Australia were convinced that the RN was a decade or more behind in capability. The Government was reported as allowing up to $5m for RAN modifications,[262] which seems to

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258 Interview with Commodore Ormsby Cooper. Pages 9-10
259 ibid
260 Interview with Mr Andrew Johnson. Page 14
261 "It's Official: RAN to Get HMS INVINCIBLE," *Royal Australian Navy News,* 26 February 1982, Vol25 No3, Page 1
262 ibid

have been a very small amount of money when considering the changes the RAN may have wanted.[263] Cooper comments that the idea of the RAN adopting a second major surface to air missile system with all of the associated logistical issues was a very unwise thing to contemplate.[264]

Herein lay an example of what had been learned from the DDG experience. The high level of technical management and expertise needed, as well as the importance of logistical support which had been so lacking in the early days of the DDG, now resonated clearly with some in RAN positions of senior authority. They questioned the merit of taking a decision which had major ramifications for the entire RAN, because in effect to purchase *Invincible* and not change its combat system would place inordinate demands on a small Navy. Moreover, the cost of its conversion was probably underestimated by a considerable margin. The problem of supporting multiple combat systems did not eventuate because, less than six months later, the acquisition of *Invincible* was cancelled following its service in the Falklands War and a reprieve on its disposal being achieved by the RN.[265] Other options to replace *Melbourne* were considered, but ultimately no solution was found.[266]

JPTDS was further adapted by the USN and used to equip its Perry class FFG-7s using upgraded hardware. The RAN decided to install its own software when the ships arrived in Australia in 1981 and replaced the USN Weapons System Processor with the RAN NCDS program.[267] The RAN further improved the DDG NCDS program so that it would achieve a degree of commonality between the two classes, as well as incorporating Link 11 into the combat systems of the FFGs, a feature that did not exist in their original USN configuration. Through adoption of a multi-class combat data system standardisation approach, it was assessed that "…The RAN decision to adopt the DDG program as standard for FFG 1-3 has allowed

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263 It is possible that the RAN was operating under a Government or self-imposed stipulation that minimal change was to be undertaken to *Invincible*, in the short term at least, and that a wholesale change of the combat system was not envisaged.

264 Interview with Commodore Ormsby Cooper. Page 14

265 Interview with Vice Admiral David Leach, 14 March 2012. Page 17

266 "Converted Merchant Ship New Carrier Option," *Royal Australian Navy News,* 30 July 1982, Vol25 No13, Page 3

267 Geoff Cannon, *Technology Transfer, Knowledge Partnerships and the Advance of Australian Naval Combat Systems*, page 257

approximately 80% program commonality to be achieved between the six ships."[268] The undertaking of such a modernisation with its new FFGs indicates that the RAN had learned much from its early DDG NCDS experience, and had acquired confidence in its ability to manage such systems.

Data Links

Amongst the multiple considerations in choosing JPTDS, one of the most critical was to ensure interoperability between the RAN and USN. As the USN turned increasingly to using computerised systems and data links for management of the battle at sea, the RAN also had to adjust or to accept not being able to join the digital network. Data sharing between ships was part of the original concept for NTDS[269] and was demonstrated by the Canadians in 1950.[270] For the RAN to have retained an analogue combat system in the DDGs would have placed the RAN in a position in which its value in a USN force would have been much less than otherwise. The NCDS project appeared not, however, to have a full appreciation of the importance of the data link and the role of the communications sub-system as an element of the combat data system (see Figure 3 on page 144). The UHF communications equipment in the DDGs was not improved until several years after NCDS was installed, and until that time they proved technically incapable of using the protocols required for data link operations.[271] The communications capabilities of the DDGs, and the RAN generally, were technically not capable of hosting the digital data needed in the emerging anti-air warfare environment, and some equipment installed in the 1950s and 1960s remained in service until the 1980s.[272]

Until the UHF radios in DDGs were replaced, data link transfer between ships and aircraft had to be conducted using HF radio. In terms of operational security, HF radio transmissions could be a major source of intelligence to an opponent, but the alternative was not to use HF and hence lose use of a very important method of sharing tactical data.[273] Initial RAN experiences of Link 11 operation with the DDGs gave it the understanding necessary to comprehend the important benefit of its implementation in FFG software. The concept of network centric

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268 Royal Australian Navy, *Guide to the Modernised RAN DDG. Dated 1 July 1988. (SPC.DS.21.1)* Annex A to Chapter 3 Page 1. At the time, the RAN had three DDGs and three FFGs. The common NCDS program was later adapted for installation in its subsequent further three FFGs.

269 David L. Boslaugh, *When Computers Went to Sea*, page 119

270 ibid page 62

271 Personal Communication from Captain David Cotsell, page 2

272 ibid

273 ibid

warfare (NCW) was addressed in detail by Friedman who characterises the importance of Link 11 as "… in effect, the price of admission to an important club..."[274] Through its adoption of JPTDS/NCDS, the RAN was one of the earliest non-USN members of that club.

Richard Menhinick served in *Brisbane* in the first Gulf War and recounts interoperability problems between the RAN, RN and USN in exchanging information via Link 11.[275] The difficulty was caused through each Navy meeting differing levels of compliance with associated technical protocols. The consequence being that HMS *Gloucester* was unable to maintain the stability of its combat data system which, Menhinick assesses, was crashing about 25 times per day. As the software took about 20 minutes to re-load, this was a highly unsatisfactory situation in a combat zone. He remarks that the USN was aware of the problem and had developed a patch which solved the issue in USN ships, but the RN had no such solution. *Brisbane* sought assistance from CDSC and its personnel worked on the New Year's Day holiday, taking about 18 hours to solve the problem. Menhinick summarises his thoughts thus: "…that was standard operating procedure…we weren't as good as the Brits at damage control, we weren't as good at launching boats…but …we knew combat systems."[276] For its work in supporting this urgent requirement and more generally providing excellent service to the Fleet, CDSC was awarded a Maritime Commander's Commendation "… for its outstanding professionalism and devotion to duty during Operation DAMASK."[277]

The sharing of tactical information by data links did not extend to the six ships of the RAN River class even though they underwent a significant modernisation program announced at the same time of upgrading the DDGs to NCDS.[278] The year-long technical investigation undertaken by Cooper revealed that development of requirements and an engineering solution to provide a digital combat data system would have resulted in its installation only a few years before the ships were to be retired from service, and it did not proceed.[279] Information sharing within the naval tactical communications network when a River class ship was present consequently remained via voice radio circuits, a methodology not suited to the

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274 Norman Friedman, *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars*, pages 88-89

275 Interview with Commodore Richard Menhinick. Page 18

276 ibid page 20

277 David Wellings Booth, Geoff Cannon and Glenn Bridgart, *Bits and Bytes*, page 7

278 "Government's Five-Year Defence Programme," *Royal Australian Navy News,* 1 September 1972, Vol15 No 8, Pages 2-3

279 Interview with Commodore Ormsby Cooper. Page 7

higher tempo with which naval operations increasingly had to cope. The lack of tactical data interoperability between units of the RAN and the constraints it introduced to operations served to reinforce the idea that the RAN consisted of both an American and British element, of which the American was more modern, casting the British as being the less equal of the two.

The ADF took its formative steps with NCW through acquiring Link 11 with NCDS. In a 2006 guide to NCW, the ADF determined that "NCW is a means of organising the force by using modern information technology to link sensors, decision makers and weapon systems to help people work more effectively together to achieve the Commander's intent."[280] Effective networking of combat systems introduced in the DDGs thus became a critical enabling capability for the ADF in the 21st Century.

DDG Modernisation – Achieving Through-Life Service

Second Major Modification of the DDGs

Commencing in the mid-1980s, the DDGs were again substantially modified by the RAN, the purpose of which was to:

> "…extend the lives of the ships by at least 10 years following completion of the modernisation, and to maintain the existing capability of the ships by selective upgrading of the combat systems and associated ship systems. Later phases of the project aim to increase the capability by installation of the Harpoon surface to surface missile system and a chaff decoy anti-ship missile defence system."[281]

The project envisaged all three ships being modernised in four phases that initially included an upgraded Ikara system, known as ILLAROO,[282] as Phase 2, but this was cancelled and Ikara itself subsequently removed. *Brisbane* commenced its modernisation program in September 1985, *Perth* in March 1987 and finally *Hobart* in September 1988, with the combined refit and modernisation costs of the project estimated as $504.7m.[283] The list of equipment to be modified was extensive and included NCDS, the Standard missile system and its sub-systems, gun mounts, AN/SPS-52 and AN/SPS-40, installation of the newer radar AN/SPS-67 to replace

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280 Department of Defence (Australia), *Explaining NCW - Network Centric Warfare* Canberra: Defence Publishing Service, 21 February 2006. Page 5

281 Royal Australian Navy, *Project 1230 - DDG Modernization (Equipment Acquisition Strategy). Dated 19 February 1988. (SPC.DS.63.1),* Navy File 91-28893 Pt 1 Canberra: Sea Power Centre Australia. Page 1

282 ibid

283 ibid paragraph 30

AN/SPS-10, and a new integrated automatic radar tracking system known as AN/SYS-1. Air conditioning and habitability improvements were to be made at the same time, with improved electronic warfare equipment to follow.[284]

The intention to "maintain the existing capability" implied that with some technical improvements the ships would be capable of meeting foreseen operational demands for the remainder of their lives, but this was not the case in practice. The USN had adopted SM-2 from the mid-1970s as its standard long range missile for area air-defence,[285] a role the RAN DDGs still had for the RAN. Dibb's forecast in 1986 of a more lethal air threat[286] had no impact on the later DDG modernisation, which retained SM-1, although SM-2 was capable of being launched from the DDG missile launcher system which was common with that of the FFGs.[287]

In the same timeframe as the second DDG upgrade was being undertaken, the Anzac frigate project had established that SM-1 was not optimal against the modern air threat for short-range self-defence. Captain Skinner (the Anzac frigate Project Director) remarks: "…the loss of ships by the RN in the Falklands War caused some in Canberra to question the ability of surface combatants to survive in an air threat."[288] The Falklands war also gave credibility to the RN PWO doctrine where prolonged periods of high degrees of readiness were the norm.[289] Skinner notes that considerable effort was expended in modelling and simulation to assess how ships could "…survive and function effectively in times of anti-ship cruise missiles."[290] An important component of the Anzac work was to consider the effectiveness of SM-1 against such a threat taking into account its minimum range and reaction time. Modelling showed that the Evolved Sea Sparrow Missile (ESSM) had a greater effectiveness for this purpose and it was subsequently chosen for the ships.[291] The second modernisation of the DDGs did not

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284 ibid paragraph 8

285 Raytheon Company (USA), *STANDARD MISSILES Public Release Portfolio Revision F (2012) (SPC.DS.27)*, 1-63)

286 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence* Canberra: Australian Govt. Pub. Service, 1986. Page 128

287 Raytheon Company (USA), *STANDARD MISSILES Public Release Portfolio Revision F (2012) (SPC.DS.27)*, 1-63)

288 Interview with Captain Christopher J. Skinner. Page 42

289 For description of the successful Argentinian attack on HMS *Sheffield* with a French made Exocet missile, and mistakes made by the RN PWO in the managing *Sheffield's* operations room, see: Sandy Woodward, *One Hundred Days : The Memoirs of the Falklands Battle Group Commander*, ed. Patrick Robinson London: London : HarperCollins, 1992, pages 1-22

290 Interview with Captain Christopher J. Skinner. Page 43

291 ibid

appear to take into account the lessons of the Anzac frigate project in the form of taking full cognisance of the anti-ship missiles that had become present in Australia's region and against which the DDGs might have to defend themselves. As we have seen, this issue had to be addressed before *Brisbane* deployed to the first Gulf War in 1990.

DDG Modernisation Acceptance Board

An Acceptance Board was appointed by CNS Hudson in May 1987 for the purpose of advising him whether *Brisbane* should be accepted into naval service when its modernisation reached an appropriate point, a process referred to as AINS.[292] The Board was chaired by the Deputy Chief of Naval Staff (DCNS), Rear Admiral Neil Ralph.[293] The significance of this event was in the recognition that the uniqueness of the RAN's DDGs and the RAN's increasing self-reliance for them required competent assessment to validate the modernisation outcome. It could also be seen as an example of the learning that had taken place in the RAN about carefully evaluating its own performance, which in this case involved the ship and all the enabling factors that went toward achieving the capabilities it embodied. While significant technical elements of the ships continued to be sourced from the USN, the configuration of the ship, particularly the combat data system, was the responsibility of the RAN, as was the establishment of its operational performance criteria. The scope of these changes reflected the confidence that had grown in CDSC and in the RAN generally in managing the risk of modification.[294] The alternative was again to consider taking the ships out of service as the USN was already doing, but as we have seen in Chapter 3, this was not being considered.

The Board found there was much to be satisfied with, but *Brisbane* had several significant problems needing remediation. Installation of the AN/SYS-1 was found to have markedly improved the automatic detection and tracking of air targets, and weapon effectiveness had also improved, particularly because the previous analogue gunnery system was replaced by a digital capability, but the data link was unreliable.[295] In remarks reminiscent of 1976 when the

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292 AINS – abbreviation for Acceptance Into Naval Service

293 Royal Australian Navy, *HMAS BRISBANE - Acceptance Board Report at Acceptance into Service (Report by Chairman of Acceptance Board). Dated 10 October 1988. (SPC.DS.12.1),* Navy File 18-12-55 Canberra: Sea Power Centre Australia.

294 Geoff Cannon, *Technology Transfer, Knowledge Partnerships and the Advance of Australian Naval Combat Systems*, page 257

295 Royal Australian Navy, *HMAS BRISBANE - Acceptance Board Report at Acceptance into Service (Report by Chairman of Acceptance Board). Dated 10 October 1988. (SPC.DS.12.1)*, page 2 and page A-3

required operational performance of JPTDS was not known by the RAN, the Board found that in that regard "… that there was scant information against which an assessment could be made."[296] There had been a failure to relate the tests and trials of the ship to a formally approved detailed operational requirement, but the Board noted that progress was being made in overcoming the deficiency, and that development of a Combat System Evaluation was also progressing.[297]

Despite all the improvements accomplished by the project, the Acceptance Board also noted that "…regardless of the achievements in the operations area of modernisation, the ship is severely lacking an ASMD[298] capability. Notwithstanding that providing a chaff facility would assist in this area, the lack of a hard kill capability should be viewed with concern."[299] Commander Anderson was the DDG Modernisation Project Director when the requirement was initiated in late 1990 to prepare *Brisbane* for service in the first Gulf War. He notes that a Close in Weapons System (CIWS) was installed in *Brisbane* in six weeks so it could sail for Gulf War operations having protection against anti-ship missiles.[300]

The Board found numerous problems with *Brisbane*'s state of progress toward completion and the degree of detail in the 1988 report shows how thoroughly and holistically it had assessed the results. It notably found that training for the DDGs as a class had suffered because of insufficient places at sea for trainees caused by the overlapping ship modernisation programs. Lieutenant Commander Purcell had drawn attention in 1976 to the importance of providing automated data reduction capabilities for system testing in *Perth*'s modernisation, but this deficiency was again raised with *Brisbane* in 1988. The Board recommended that "… introduction of a Test and Evaluation Master Plan (TEMP) should improve the early identification of analysis resource requirements for future projects…"[301] That a TEMP did not

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296 ibid page 3

297 ibid

298 ASMD – abbreviation for anti-ship missile defence

299 Royal Australian Navy, *HMAS BRISBANE - Acceptance Board Report at Acceptance into Service (Report by Chairman of Acceptance Board). Dated 10 October 1988. (SPC.DS.12.1),* page 4. 'Hard kill' is a term used to mean an attacking vehicle, such as a missile, will be destroyed by kinetic force, such as from an exploding warhead. 'Soft kill' is used to mean the attacking vehicle is decoyed in some manner and fails to achieve its purpose, such as striking a ship.

300 Interview with Commander Antony Anderson. Page 37

301 Royal Australian Navy, *HMAS BRISBANE - Acceptance Board Report at Acceptance into Service (Report by Chairman of Acceptance Board). Dated 10 October 1988. (SPC.DS.12.1)* Annex A Page 7

exist should have been a cause for concern, but without a clear linkage to the operational performance requirement, which itself did not exist in a clear fashion, it would not have been possible to develop a plan that was fully meaningful. The RAN could therefore only make a technical assessment of how well the equipment performed against its anticipated installed technical standard. Although such equipment might have met its technical specification, knowing whether it could meet its operational performance requirement was just as important from a Fleet standards perspective, as had been discussed and critiqued at the Fleet Headquarters conference 12 years previously in 1976.

Logistical support of the ship was considered unsatisfactory to the point of having a major impact on *Brisbane's* operational availability, and was serious enough for the Chair of the Board to recommend that CNS not accept *Brisbane* until it was addressed.[302] In taking this action it can be seen how far the understanding of logistical support had progressed in the RAN from the time when the ships were first acquired and slight evidence was then present of such thinking.[303]

DDG – End of Service Life

Following *Brisbane*, *Perth* completed its final modernisation in November 1989 and sailed for sea trials exactly three years after arriving in the dockyard to commence the refit.[304] *Hobart* completed its modernisation in August 1991, after a period of 29 months out of service.[305] The ships were still the most modern in the RAN but Menhinick feels that the RAN had lost its strategic compass in terms of understanding the importance of an air defence capability at sea.[306] *Brisbane* had participated effectively in the first Gulf War but, by the mid-1990s and potentially earlier, the DDGs were no longer capable of meeting modern threats.[307] The German Navy had shown that by integrating AN/SPS-67 with AN/SYS-2, their Rommel class DDGs had been able to detect sea skimming missiles at close ranges, which the RAN's DDGs could not do as effectively.[308] Menhinick remarks that an opportunity to upgrade the DDG

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302 ibid
303 Interview with Commodore Ormsby Cooper. Page 25
304 "PERTH Powers On," *Royal Australian Navy News,* 24 November 1989, Vol32 No22, Page 9
305 "Hobart, Orion Refits Over," *Royal Australian Navy News,* 30 August 1991, Vol34 No17, Page 3
306 Interview with Commodore Richard Menhinick. Page 30
307 ibid
308 ibid page 28

from AN/SYS-1 to AN/SYS-2 for about $80,000 to achieve a similar capability could not be afforded.[309]

Support for the DDGs through USN sources became increasingly difficult to achieve, and in May 1993, the Minister for Defence, Robert Ray, announced that Australia would purchase the former USS *Goldsborough* for US$2.2m. *Goldsborough* was one of the four USN JPTDS DDG conversions undertaken by the USN and some of its equipment, including the missile system, would be removed from the ship and located in RAN training facilities before it was then stripped for spare parts and sold for scrap.[310] *Brisbane* decommissioned on 19 October 2001,[311] achieving over 10 years of service beyond its final modernisation, albeit with questions emerging several years earlier about its operational effectiveness.

From 2001 the roles of the DDGs were assumed by the yet to be modified FFGs, but as we have seen, the then Chief of Navy would have been very reluctant to commit those ships to the second Gulf War of 2003 if the threat scenario had been similar to what he experienced in 1991.[312]

Beyond the Naval Combat Data System

Charles F. Adams Destroyer to Anzac Frigate

Rear Admiral Purcell considers that the selection of NCDS was extremely important for the RAN. It provided knowledge and opportunities to build on and further exploit the NCDS capability, such as was done in adapting DDG software for the FFG, and might have been done for the replacement aircraft carrier.[313] A considerable investment had been made by the RAN in managing digital combat data systems and in learning and understanding the benefits of achieving commonality where sensible. Until arrival of the first Hobart class DDG in 2017 however, the FFGs were the last class of USN warship acquired by the RAN in which US origin software was a central element of the combat data system.[314] When the FFG Upgrade commenced in 2003, there appears to have been no ability to develop RAN NCDS software further to meet operational requirements, suggesting also that no comparable capability

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309 ibid page 24
310 "Surplus USN DDG for RAN," *Royal Australian Navy News,* 7 May 1993, Vol36 No8, Page 3
311 "Warship Ends Era," *Royal Australian Navy News,* 29 October 2001, Vol44 No21, Page 1
312 Interview with Vice Admiral Christopher Ritchie, 30 January 2013. Page 64
313 Interview with Rear Admiral Peter Purcell. Page 44
314 The Hobart class is a derivative of the Spanish Armada F-104 frigate design and is to be fitted with the USN Aegis system.

existed in the USN for which adaptation might have been possible. Cannon notes that the four remaining FFGs would have their NCDS capabilities replaced by 2007 with a system known as ADACS.[315] The new system brought with it the ability to utilise the newer Link 16 which dramatically increased the quantity and quality of information available to the command.[316]

As ADACS was being developed for the FFG upgrade, the final version of FFG NCDS software was delivered by CDSC to *Newcastle* in 2005.[317] The Naval Warfare Systems Agency (NWSA) was established in Sydney as "…a one-stop-shop at GID"[318] incorporating the responsibilities of CDSC, which closed in 2006. In a message to the RAN on 30 June 2006 announcing amalgamation of the two organisations, the Chief of Navy[319] stated:

> "On 01Jul06 …NWSA will continue to expand combat system regulation and technology services…the changes mark the end of some 30+ years during which time CDSC has been a centre of expertise for Navy's combat system technology…including our very important and valuable relationships with many USN partners…CDSC has provided excellent service to the RAN and uniquely contributed to the birth and development of combat system technology in Australia…"[320]

Notwithstanding the age of the ships, the changes incorporated in the modernised FFGs are regarded by Commodore Lee Cordner, a former FFG Commanding Officer with first Gulf War experience, as making them "…the most capable warships in the history of the Royal Australian Navy."[321] The experience gained by the RAN through its acquisition of NCDS for the DDGs could reasonably be said to have contributed to achieving such an accolade.

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315 ADACS – abbreviation for Australian Distributed Architecture Combat System

316 Geoff Cannon, *Technology Transfer, Knowledge Partnerships and the Advance of Australian Naval Combat Systems*, pages 264-265

317 David Wellings Booth, Geoff Cannon and Glenn Bridgart, "Photographs," in *Memories of CDSC (Where the Navy Went to Bits)* (Canberra: Royal Australian Navy, 2009c), page 32

318 "FFG Upgrade is on Course at GID Site," *Royal Australian Navy News,* 30 October 2000, Vol43 No21, Page 10. 'GID' is the Garden Island Dockyard located in Sydney.

319 Vice Admiral Russell Shalders. See: http://www.navy.gov.au/biography/vice-admiral-russ-shalders

320 Chief of Navy message 300211Z JUN 06 contained in: David Wellings Booth, Geoff Cannon and Glenn Bridgart, *Bits and Bytes*, pages 10-11

321 Lee Cordner, "The most Capable Warships in the Navy's History Set to Join the Fleet," *Headmark (Journal of the Australian Naval Institute),* 130, 2008, 4-14

Anzac Frigates

The Anzac frigate program announced in 1987 followed on from construction of Australia's FFGs at Williamstown, Victoria. At one point, the Anzac was mooted as the standard frigate for the RAN, with the idea of a derivative of the design becoming the replacement for the DDGs and potentially the FFGs.[322] Purcell remarks that the combat system acquired for the Anzac*s* was sourced from a Swedish vendor and had no relationship whatsoever with NCDS, but it "…was best value for the money."[323] He notes that Australia has bought a lot of European equipment on the premise that it is the best value for money, but in his opinion "When you do the evaluations…it's almost a process; a formula type process that leads to source selection, and a lot of the parameters that ought to be taken into consideration are just not able to be quantified or just don't get the right sort of weighting."[324] Purcell's remarks can be interpreted as meaning that the inter-relationship of tangible and intangible factors needed to be better understood by Defence when making such important decisions, and intangible factors include existing arrangements and relationships.

In regard to the choice of combat system for the Anzac frigate, Captain Skinner remarks that the choice, while not unimportant "… wouldn't have been a major determinant."[325] Skinner's point was that it was the overall capability that mattered. Vice Admiral Walls notes that when naval capability was being considered in the Dibb Review, the RAN already had six FFGs[326] and three DDGs which were going to be extended, so the high end was reasonably well placed in capability terms, but a less capable ship was needed and there were no options available from the USN.[327] In practical terms for the RAN, USN options were unaffordable and the Anzac frigate had emerged from that circumstance. Walls remarks further that commonality with other RAN platforms and systems came into the equation of considerations, but the dilemma was to decide how much commonality was enough and how much would it cost.[328]

With the Anzac frigate, the RAN found itself acquiring a new ship to which it fitted USN-origin radars and weapons, as well as Swedish radars and a Swedish combat data system. While the

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322 Department of Defence (Australia), *Force Structure Review* Canberra: Australian Government Publishing Services, May 1991. Page 14
323 Interview with Rear Admiral Peter Purcell. Page 44
324 ibid
325 Interview with Captain Christopher J. Skinner. Page 44
326 In 1986 there were four FFGs in service with a two further to be introduced.
327 Interview with Vice Admiral Robert Walls. Page 22
328 ibid page 23

combat system may have been adequate, the lack of a clear policy as to how the RAN would invest in the future combat systems it wanted, rather than being restricted to what was offered by a potential supplier, again left it with limited options. The solution it adopted with the Anzac was to mix and match elements of the combat system to meet the operational requirements of the ship within its budget, and also to retain interoperability but not full standardisation with the USN. While this approach was not without its challenges, it represented a growth in terms of the RAN's self-reliance and understanding of combat systems which had been building since it had acquired NCDS in its DDGs, leading to this later confidence in its ability to adopt the Anzac solution.

RAN inability to follow USN Combat System Evolution

The inability of the RAN to adopt a USN combat data system solution for the Anzac frigates was an outcome of both the choice of a small ship, and the direction taken by the USN with the evolution of NTDS. By the mid-1970s, even with improved AN/UYK-7 and AN/UYK-20 computers, NTDS was regarded by the USN as having become badly overloaded.[329] The USN had to look to its own future and came to the view that NTDS was no longer sustainable. USN studies in the 1960s had shown that both Terrier and Tartar missile systems were vulnerable to saturation attack, which had led to establishment of the Typhon program.[330] Typhon was cancelled in 1963 because of cost and technical risk,[331] but was the precursor to the modern day USN Aegis system.[332] From 1955 to 1995, the USN progressively merged individual elements into a fully integrated combat system. It progressed through the stages of NTDS to New Threat Upgrade (NTU), to the Advanced Combat Direction System (ACDS), and added the Cooperative Engagement Capability (CEC) to support its concept of linking all sensors and weapons in multiple ships, aircraft, shore and space-based elements into a fully networked combat system capability.[333] The USN Aegis combat system represented the culmination of that evolution, but also experienced frequent change.[334]

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329 Norman Friedman, *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars*, page 84

330 Norman Friedman, *U.S. Destroyers: An Illustrated Design History*, page 223

331 ibid page 223

332 ibid

333 Diagrammatically represented in David L. Boslaugh, *When Computers Went to Sea*, page 392

334 United States Navy, *AEGIS Combat System - Sea-Air-Space Exposition April 2013,* Washington D.C.: PEO Integrated Warfare Systems.

The RAN could not match the USN in being master of its own destiny. The changing organisational arrangements produced by multiple reviews of the Australian Department of Defence resulted in the shifting of responsibilities for the development of naval force structure and associated capabilities.[335] No overarching combat systems development strategy emerged to shape how the RAN progressively built upon its acquired knowledge and expertise. There was no champion for combat systems other than CDSC, which of itself was not in a position to move the levers of organisational power. Regardless, as we have seen, RAN shortcomings in an Australian-led UN operation in East Timor in 1999-2000 rekindled political awareness of the need for naval air defence, leading to government approval to build three modern DDGs to be delivered post-2016.[336] In December 2005, the Minister for Defence, Senator Robert Hill, announced that "…the Government has approved the purchase of three Aegis Weapons Systems from the United States that will form part of the Aegis Combat System – the core capability of the AWDs."[337] Prior to that announcement, Vice Admiral Ritchie noted that "The CNO and I signed a Statement of Principle in Surface Warfare in 2004…"[338] This agreement, *inter alia,* permitted the sharing of information relating to Aegis between the RAN and the USN.

Conclusions - Impact of the DDGs on RAN Digital Combat Systems

This chapter has examined the impact of introducing digital combat systems into the RAN through the DDGs, thus entering the digital era. The RAN was Australia's first military service to embark on the path of acquiring large scale digital combat systems.

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335 The process of centralising functions associated with force structure development, thereby reducing the ability of the Services to control their own capability development, was given strong impetus by implementation of the 1973 Tange Review. The 1986 Dibb Review recommended full centralisation of single Service staff associated with the development of capability requirements, and this was subsequently adopted. For a time-phased diagram of these changes See: Appendix C to the report by David Peever, *First Principles Review of Defence - Creating One Defence* Canberra: Department of Defence, 2015

336 Commonwealth of Australia, *Defence 2000: Our Future Defence Force* Canberra: Defence Publishing Service, 2000. Page 90

337 Department of Defence (Australia), *Purchase of Aegis Combat System for Destroyers (MIN 196/05)* dated 9 December 2015, (Canberra: Commonwealth of Australia)

338 Royal Australian Navy, *Haul Down Report of Chief of Navy: Vice Admiral C.A. Ritchie RAN. Dated 3 July 2000. (SPC.DS.41.1),* Canberra: Sea Power Centre Australia. Page 13. The precedent for such an agreement between the two navies had been established in 2001 when a similar Statement of Principle for collaboration in submarine matters was signed. See "CN Visit Cements Old and New Ties," *Royal Australian Navy News,* 1 October 2001, Vol44 No19, Page 6

In the mid-to-late 1960s, parallel investigations were being conducted by the RAN to identify digital combat systems suitable for the DDL project, and for the DDGs. Eventually the cost and technical risk to the DDL, coupled with the significantly valuable offer of receiving USN intellectual property at no appreciable charge, meant that JPTDS became the combat data system of choice for the RAN. At the time it was selected, JPTDS formed the aspirational but eventually unachieved basis of all RAN combat data systems for the DDL, the DDGs and the Oberon submarines. The RAN was not experienced in this field and it took several decades to increase its knowledge and attain a level of operational and technical maturity.

The Adams class were amongst the most capable analogue USN destroyers and, except for Electronic Warfare capabilities, their greater modernity relative to other ships of the RAN was substantial. Notwithstanding, in 1975 *Perth* had its 10th birthday from commissioning while undergoing near total replacement of its analogue missile and combat data systems with digital equivalents in a California shipyard. JPTDS was called NCDS by the RAN. An arrangement was put in place for the USN to maintain software related to the updated digital Standard missile system, with the RAN being responsible for that of NCDS. Installation of an RN digital system in lieu would have proven technically and financially highly risky, and not installing a digital system at all would have contributed to earlier obsolescence of the DDGs, as well as to loss of their interoperability with the USN. The RAN did not initially know in detail what the operational performance of NCDS was, or should have been, and its introduction into operational service showed there were different expectations on the part of operational and technical experts. Although the technical parameters of the missile and combat data systems were only known to varying degrees of detail, the RAN was otherwise confident that the operational performance of JPTDS required by the USN would also satisfy itself, a confidence present when the DDGs were first acquired. The faith of the RAN was generally rewarded, but it demonstrates that progress still had to be made in being sure of its own requirements and how they should be satisfied.

A version of NTDS had been considered by the USN for installation in its last batch of DDGs starting construction in the early 1960s, which included those for the RAN, but cost pressures and higher USN priorities prevented it taking place. Cost issues led again later to the USN only modernising four of its DDGs to the JPTDS standard, underscoring that the ships had never been as important to the USN as to the RAN. By 1993 the USN had withdrawn them all from

service, but the RAN was able to make good use of the knowledge it had accumulated in supporting its own NCDS. For the second modernisation of its ships, the RAN had primary responsibility for their operational requirements and associated technical solutions, but this project, like the first, was primarily designed to ensure technical support of the DDGs for their remaining life. That philosophy seems to have involved an assumption that through updating their technical capabilities, the ships would also retain an acceptable level of operational capability. As before, the RAN did not establish in detail the operational capability it sought to meet its requirements. Hence, the delivered performance of *Brisbane* in 1988 was a function of the technical characteristics of the equipment fitted to the ship, rather than its proven performance against operational specifications. This was the same situation in which the RAN had found itself when NCDS was first installed and which had been the subject of an important conference led by the Fleet Commander in 1976, which had found *inter alia* that there was considerable room for improvement in how the RAN undertook defining and meeting its operational needs.

When Australia's Government assigned *Brisbane* to combat operations in the first Gulf War of 1990-91 it was necessary to provide additional combat capabilities not catered for in planning its remaining time in operational service. This suggests that the operational requirements specifications for the second modernisation were deficient in terms of the threat to be countered, or that insufficient resources were available, or both. It is possible to conclude that by the mid-1980s the RAN did not yet have an effective method of developing and translating operational requirement statements into technical and other specifications, and then of testing the ship against an appropriate operational scenario to validate its performance.

The USN had commenced replacing SM-1 with SM-2 in the late-1970s because it was no longer capable of defeating the modern air threat, but the RAN's DDGs retained the SM-1 missile system until their departure from service in 2001. Hence, it is possible to say from the early 1990's and perhaps earlier, that the air defence capabilities of the DDGs did not match the potential threat. In effect, the RAN kept the DDGs in service for too long and an operational capability gap had opened before their departure. The later modernisation of the FFGs included replacement of their SM-1 systems with SM-2, about 30 years after its introduction by the USN.

Although the ships were based in Sydney where the primary RAN warfare training centre was located, operational training for the NCDS DDGs was initially conducted at CDSC in Canberra. Some training of operational personnel on NCDS equipment was possible at CDSC, but through it not being electronically linked to *Watson*, more comprehensive advanced training in multi-ship scenarios was not possible. The development of naval tactics and doctrine for use by the DDGs was also inhibited by the same circumstance. Apart from the inconvenience and cost of travel to Canberra by CDSC's trainees, its location contributed to delaying provision of NCDS equipment at *Watson* until the late 1980s, being about 15 years after *Perth* was converted.

Configuration of training system simulators at *Watson* did not mirror that of the modernised DDGs until 1994, approximately five years before *Perth* and seven years before *Brisbane* decommissioned, and 18 years after the Fleet Commander in 1976 had pointed to its urgency. The inference drawn is that RAN resource constraints meant that priorities for operational training facilities had to be balanced against a wider range of demands, and a judgement was made that extant circumstances were acceptable. Those who were affected though, were left to make up the training deficiency through self-endeavours, raising the prospect that DDG knowledge and skills would not be refreshed or instead become diluted. Such an unmanaged training arrangement for its personnel placed the operational performance of the Navy at risk.

The seaman sub-specialist officers who commissioned the DDGs were all RN 'Long Course' qualified and who had adapted their RN fighting doctrine to the C-I-C arrangements of the analogue DDGs, which were designed to USN concepts. As the RAN was modifying its DDGs with digital capabilities, the RN's fighting doctrine had changed in response to the way in which the missile threat at sea was evolving, and the PWO doctrine was implemented as replacement for its Long Course philosophies. The nature of the threat had become one whereby the ship's crew, its sensors and weapons had to be continuously ready because there would be no preparatory time to order 'Action Stations'. Other officers and sailors operated equipment designed and functionally arranged so as to enable comprehensive management of the tactical picture and the battle, but both the PWO and Command needed to know what was happening in real-time, and therefore had to be integrated into the information flow. The RN's experience in the Falklands War generally validated its warfighting philosophy of ships being continuously ready to react.

JPTDS was designed for the way the USN managed its C-I-C, but RAN officers trained in the RN way of fighting a ship axiomatically applied its doctrine in RAN ships. There was little if any scope by the RAN to modify the layout of the analogue DDG C-I-C when the ships were first acquired from the USN, or to make significant technical changes when NCDS was later installed. There may have been an opportunity to make such changes to the DDGs during their final modernisation, but it would likely have been an expensive undertaking. Throughout the lives of the DDGs, and particularly with NCDS, the RAN grappled with an incomplete implementation of how its operational doctrine decreed it should fight the ship, and it had to improvise procedurally and with adapted software.

The intention in 1972 to integrate Ikara with NCDS was not achieved by the time Ikara was removed from the DDGs in the late 1980s, and EW similarly remained a separate sub-system with limited ability to fully exploit its valuable potential. Lessons learned by the RAN of integrating its fighting doctrine with its equipment in that era took until *circa* 2013 to be implemented when its Anzac frigates were modernised with updated ASMD features, and major improvements were made to its command and control capabilities as well as the layout of its functional operations room elements. None-the-less, the ability of the RAN to adapt its DDG NCDS software and the combat system of the FFG was a sign of its growing technical expertise and confidence in understanding and managing operational digital systems. As the costs of ownership of software became more understood, the benefits of commonality and its re-usability where sensible were recognised as part of the modern approach to combat data systems management. Supporting the NCDS of the DDGs aided in building that essential understanding. Had the RAN acquired an RN aircraft carrier with its associated digital combat system, the burden on the RAN of supporting it would have been considerable. It would also have extended the period of the RAN having major ships with origins in both the RN and USN, and dealing with the myriad of logistical complications and associated costs through a lack of commonality.

Link 11 was introduced to the RAN through the acquisition of NCDS for the DDGs, and later became the standard data link for the RAAF P3 Orion maritime patrol aircraft, contributing to both Services building on their mutual expertise in the exchange of digital data. Those early experiences demonstrated how valuable it was to exchange digital data between multiple platforms, which served to enhance the ability of the Command to be kept abreast of rapidly

changing circumstances. Adoption of Link 11 was amongst the first steps taken by the ADF towards what is now commonly referred to as Network Centric Warfare. Further, in the Pacific region, from the mid-1960s particularly, the RAN and USN had often worked together, and achieving interoperability between them was, and remains, an enduring essential requirement from an ANZUS alliance perspective. A converse situation partially emerged for the RAN because the RN-origin River class were unable to join in the digital data exchange regime enjoyed by its USN-origin ships, thus contributing to a sense of the RAN consisting of two different navies.

After the RAN acquired NCDS, the USN's evolution of NTDS became well known to the RAN through the personal relationships built up by CDSC staff and other RAN personnel. Regardless, the ability of the RAN to join the ever-changing USN program was ultimately limited by the physical constraints of the DDGs themselves, because they were too small. However, the importance and value of the original RAN intention to become nationally independent in the management of NCDS software were proven over time. Such a capability contributed to the RAN's gaining the expertise it needed to manage the subsequent development and acquisition of combat data system software for its uniquely modernised FFGs and new Anzac frigates. Notwithstanding, by not having an effective Navy-wide combat system plan to guide further evolution, the combat data systems of the FFGs and Anzac frigates had little in common, and the efficiency benefits achieved through the DDGs and FFGs proved to be temporary.

The greatest impact on the RAN of the introduction of NCDS with the DDGs was in helping it gain experience and knowledge in terms of how to utilise and support such systems for naval operations by surface combatants. In that sense, NCDS made a substantial contribution to transitioning the RAN from the analogue to the digital era, and helped position it to acquire, operate and support the kind of advanced systems to be fitted in its future ships, such as Aegis in its Hobart class destroyers. From a broader perspective, through introduction of Link 11, the DDGs also contributed to the ADF's emerging pathway towards network centric warfare. Through its overall experience with NCDS, the RAN became more professionally capable and, we may infer more confident as a Navy, in its understanding and application of digital combat systems in meeting its operational responsibilities.

Chapter 5 – Operating the DDGs: People, Practice and Perceptions

> "Living onboard was different. There was a proper barber shop, complete with revolving red and white barber pole...Accommodation for the sailors was pretty grim... Nevertheless, sailors liked the DDGs: they were real ships with real armament."[1]
>
> Rear Admiral David Campbell, former Supply Officer HMAS *Hobart*

This Chapter examines the impact of the DDGs through the experiences of individuals who had to operate, maintain and support them. They were the people who turned the DDGs into the RAN's most capable fighting ships. The perceptions of those who were practitioners complement the official record, and are important evidence of the impact of the DDGs on the RAN. Importantly, these individuals were simultaneously participants in and witnesses to cultural, technical and other changes occurring in the RAN, and more generally in Australian society as it emerged from its post-colonial era. The DDGs were completely different in almost every respect from any other unit of the RAN, and those serving in the ships had no choice but to adjust to their new circumstances. For the first time on this scale and level of complexity, the RAN had to succeed without being able to call upon the RN for any form of assistance. A focus by the wider RAN on ensuring its successful operation of the DDGs meant that they became progressively important catalysts for broader and deeper change in the RAN.

As will be seen, the experiences of these individuals gave them greater confidence to rely upon themselves professionally. As their responsibilities and careers developed, they contributed to the RAN becoming more independent in behaviour and thus more distinctly Australia's Navy. The chapter provides new insights into the RAN officer corps during a period of considerable change in the RAN, the Department of Defence and Australia at large.

Introduction

Paul Kennedy has explored how Allied grand strategy in WWII relied crucially upon subordinates to innovate and apply the results of scientific endeavours to turn the very high level geo-strategic aspirations of leaders into fighting results.[2] His contention is that an

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1 Personal Communication from Rear Admiral David Campbell, 28 June 2012b. email. Page 1

2 Paul M. Kennedy, "History from the Middle: The Case Of the Second World War," *The Journal of Military History,* 74, January, 2010, 35-51.

important area of historical study has been neglected, which is that others, in the middle, converted strategic thought into intermediate actions in multiple forms and created the conditions for success.[3] Kennedy thus opens up an important avenue of historical research with his 'History from the Middle'.[4]

Kennedy focussed on the people who exploited technical breakthroughs, enabling the development of tactics that became critical in the Allies winning WWII.[5] Results at the tactical level were thus delivered by those who had to turn the 'big picture' into viable reality and make good the promises and commitments made by those who did not consult them. Even in its delivery, those involved may never have become cognisant of the grand plan. Those who devised grand strategy may have had only a limited understanding of the implications of their aspirations at the macro, let alone the micro-level of their organisations. In practical terms, they had little choice but to delegate achievement of their goals to people who executed their direction. They had to accept the implied risks that came from only expressing the 'what was to be done', and not the detail of 'how it was to be done'. The quality of subordinate people and their ingenuity were deciding factors, as was a willingness of seniors to trust others and embrace risk.

Kennedy's highlighting of the dichotomy between policy direction and operational delivery suggests a general approach to analysing military operational developments applicable in cases such as that of the DDGs. For much of their service lives, the individuals who manned the DDGs used their initiative and skills to translate and convert government policy into action and deliver operational results, while simultaneously acting as catalysts for widespread change across the Navy itself. In the context of the RAN, and using Kennedy's approach, the people who operated the DDGs were critically in the middle, and constitute a modern naval case study of such operational implementation.

The human factor in naval history is also deserving of greater attention. John Reeve and David Stevens have brought together the experiences of Australian officers and sailors in the period

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3 ibid page 39

4 ibid

5 Paul M. Kennedy, *Engineers of Victory: The Problem Solvers Who Turned the Tide in the Second World War* New York, N.Y.: Random House, 2013

ranging from WWII to the first Gulf War.[6] Reeve notes that "We know of ships…But what do we know of the sailors or their commanders…We know little and we ought to know more."[7] The importance of individuals to a Navy can sometimes be obscured by the prominence given to the ships and other platforms they occupy. The close confines of a warship serve to intensify the wide range of emotions human beings experience and to impinge on their relationships, not the least because their ship can become their coffin. Brian Lavery examined the novel officer entry scheme introduced by the RN early in WWII, which provided a minimal level of training before its graduates were confronted by the demands of naval warfighting which required them to learn on-the-job.[8] This challenged extant precepts about how long it really took to become an effective RN officer, and contributed to changing some RN training practices post-WWII. In 1956, the RAN also adopted the revised RN scheme for its own purposes,[9] thereby remaining closely linked to its mentor. Glyn Prysor examined the personal perspectives on naval warfare of RN sailors in WWII, observing that there is a tendency to see only the ships and not their crew, and noted that the nature of sea fighting means that "…ships, not their sailors, are too often seen as the main characters. Yet ships were weapons, not the protagonists."[10] Jason Sears[11] and Kathryn Spurling[12] respectively provide important insights into the RAN officer and sailor environments from formation of the RAN through to the 1950s, and demonstrate how culturally separate those two critical human elements of the Navy were.

This chapter provides an opportunity to build upon our historical understanding of the RAN as a human institution. As we shall see, various individuals have revealed how their service in DDGs impacted on them as human beings and served to shape how they considered

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6 John Reeve and David Stevens, eds., *The Face of Naval Battle: The Human Experience of Modern War at Sea* Crows Nest, N.S.W.: Allen & Unwin, 2003

7 John Reeve, "Introduction - an Anatomy of the Face of Naval Battle," in *The Face of Naval Battle: The Human Experience of Modern War at Sea*, eds. John Reeve and David Stevens (Crows Nest, N.S.W.: Allen & Unwin, 2003), 3-38 page 4

8 Brian Lavery, *In which they Served : The Royal Navy Officer Experience in the Second World War* London: Conway, 2008.

9 Royal Australian Navy, *Commonwealth Navy Order 1022/56. the New Officer Structure. Dated 22 October 1956.* (Canberra: Sea Power Centre Australia)

10 Glyn Prysor, *Citizen Sailors - the Royal Navy in the Second World War* London: Penguin Group - Viking, 2011. Page 3

11 Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, 1997

12 Kathryn Spurling, *"Life in the Lower Deck of the Royal Australian Navy 1911-1952"* (PhD Thesis), UNSW Canberra, 1999

professional matters throughout their careers. Their reflections add understanding of the impact of the DDGs in a personal sense, in operational and non-operational situations, and provide further insights into their service as a form of history "from the middle".

The grand strategic direction for the RAN with regard to acquiring the DDGs was set by the Government through Senator Gorton as Minister for the Navy, and their acquisition by Australia was formally agreed with the United States by Prime Minister Menzies.[13] The politicians, who were intimately involved in setting strategic policy and making the decision for acquisition, while remaining accountable to the Australian electorate, had to delegate implementation of their decision to the RAN. CNS Burrell knew that challenges would have to be overcome, but he had confidence in his men and remarked "I was not unduly worried about the adaptability of our sailors, even though every department except communications would be foreign."[14] The civilian and service members of the RAN, as well as the wider Defence organisation and elements of Australian industry, had to put their minds and skills to work to get the best value out of the DDGs, particularly when they were so different from any ships they had previously operated and supported.

Even Burrell and his naval organisation were at a distance from the day-to-day operation of the ships, but Burrell was still accountable to Gorton for turning the DDGs into highly effective units of the RAN. To do this, he also had no choice but to delegate responsibility, itself an act of moral courage based upon his knowledge of his Service, and in so doing to rely heavily on the commanding officers of the DDGs and their crews to apply themselves in successfully turning the procurement decision into practice.

On 15 June 1961, fourteen days after the RAN had celebrated its 50th birthday[15] with a Fleet entry into Sydney comprising ships and submarines all having RN ancestry,[16] CNS Burrell was finalising his recommendation to the Minister for the Navy to acquire two Adams class DDGs

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13 Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia) External Canberra Telegram dated 24 May 1961

14 Henry Burrell et al., *Mermaids do Exist* South Melbourne: Macmillan, 1986, page 263

15 King George granted the Permanent CNF (Commonwealth Naval Forces) the title of Royal Australian Navy on 10 July 1911, which in 1961 enabled it to mark its 50th birthday. See: David Stevens. "1901-1913: The Genesis of the Australian Navy." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. III Melbourne: Oxford University Press, 2001. 5-27. Page 22. The RAN has subsequently adopted its birth date as being the same as the date of Australia's Federation on 1 March 1901.

16 "Fleet's Ceremonial Entry," *Royal Australian Navy News,* 23 June 1961, Vol4 No12, Page 1

from the USN.[17] When the last DDG was withdrawn from service in 2001, the RAN had reached its first centenary and accomplished much.[18] The DDGs had served in Vietnam and the first Gulf War in support of Australia's foreign policy, being the only class of RAN ships to serve in two combat theatres post-WWII.[19] Hence, for approximately 40 years, or 40% of the Navy's history, the DDGs had a distinctive and important place in the record of the RAN. A group of people whose careers spanned the same significant period were also closely associated with the DDGs, and this chapter shows how dominant the ships became as a common career step for the leadership of the Navy over an extended period of time. Their personal experiences with the DDGs and their testimony are examined here in terms of the three core proficiencies in which a Navy must individually and collectively surpass others in order to be successful. They are its capability and prowess in war and operations short of war, technical, and logistical support matters.[20] Consideration will then be given to the broader impact of the DDGs on the RAN in terms of great power naval relations, increased self-confidence and self-reliance, operational experiences, and finally, the culture of the Navy.

The DDGs at War – Vietnam and the First Gulf War

Combat operations are the most dangerous and testing for a Navy because they reveal the strengths and weaknesses it has fashioned in periods of peace. The reputation of a Navy is therefore primarily moulded through its combat performance. Post WWII, in the Vietnam War initially,[21] and then the First Gulf War,[22] the RAN worked closely with the USN and earned its

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17 Royal Australian Navy, *Minute CNS to Minister on Decision to Purchase Two DDG. Dated 29 June 1961. (SPC.DS.8),* Canberra: Sea Power Centre Australia.

18 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, pages 1-3

19 ibid pages 204 and 264. *Brisbane* participated in Vietnam operations and the first Gulf War.

20 This does not discount the importance of enabling capabilities such as intelligence, administration, human resource management etc. They contribute to achievement of the three core capabilities. It is the integration of the core capabilities that creates the fighting power of the Navy. See: Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2010*, 2nd ed. Canberra, ACT: Sea Power Centre Australia, 2010a pages 133-152 (The Constituents of Sea Power)

21 RAN deployments to Vietnam took place between 1967 and 1972. Grey provides a comprehensive summation of each of the deployments made by *Hobart*, *Perth*, *Brisbane* and *Vendetta*, which also includes how the war changed in character over the time of their deployments. See: Jeffrey Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972* St. Leonards, N.S.W: Allen & Unwin in association with the Australian War Memorial, 1998, pages 138-235

high regard for its operational proficiency, and in that context, the RAN added to Australia's reputation as a reliable ally capable of making valuable contributions to naval and other operations.

An examination of the role of the DDGs in forming that high reputation therefore adds further context as to how the ships contributed to significantly changing the RAN. A broad evaluation of the RAN's performance in those two theatres of war[23] can be achieved through systematically appraising the interplay of operations and command and control, as well as the communications and intelligence support arrangements. Collectively, this examination will indicate how the RAN met its challenges, and the contribution made by its DDGs in that endeavour.

Operational Matters- The Vietnam Theatre (1967-1972)

On their first two Vietnam deployments as units of the US Seventh Fleet, *Hobart* and *Perth* conducted operations in support of Operation Sea Dragon, and separately in providing naval gunfire support when the ships were assigned to the relevant Task Group/Task Unit as necessary.[24] Sea Dragon operations extended from southern to northern South Vietnam and into North Vietnamese waters, and involved the interdiction of coastal vessels and coastal land routes used to resupply enemy operations.[25]

Naval gunfire support missions were conducted south of the Demilitarized Zone situated between North and South Vietnam, whereby ships were assigned to directly assist US Army and Marine operations, or conduct miscellaneous harassing fire to disrupt enemy operations. After Sea Dragon was suspended by Presidential order on 1 November 1968,[26] the DDGs and

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22 For a synopsis of operations and RAN participation in the Gulf War see: Peter Jones, "1991-2001: A Period of Change and Uncertainty," in *The Australian Centenary History of Defence Volume III. the Royal Australian Navy*, ed. David Stevens (Melbourne: Oxford University Press, 2001), 239-268, especially pages 261-267

23 The term 'First Gulf War' is abbreviated to 'Gulf War' from here on except where the full term is appropriate. The term 'Vietnam War' is similarly abbreviated to 'Vietnam' where possible.

24 Edward J. Marolda, *By Sea, Air, and Land : An Illustrated History of the U.S. Navy and the War in Southeast Asia* Washington: Naval Historical Center, Dept. of the Navy, 1994, page 137

25 Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972* pages 121 - 130

26 ibid page 130

Vendetta[27] on its single deployment were then engaged primarily on gunfire support missions, and occasionally escorted USN carriers in their operating area known as 'Yankee Station'.[28] On each of their first two deployments, *Hobart's* and *Perth's* participation in operation Sea Dragon brought them under enemy fire.[29]

As we shall see, based on his experience in commissioning *Hobart*, Captain Griffiths had advocated that the RAN form a Fleet Training Group so as to fully prepare ships for operations, but it was still in its formative stages when *Brisbane* worked up in early 1969. Commander Alan Beaumont, *Brisbane*'s Executive Officer, considered that certain aspects of preparing the ship for its Vietnam deployment were unsatisfactory. This became evident when the ship deployed on operations and was attributed to the Training Group then having so few staff and having lacked DDG experience.[30]

The accuracy of the DDG gun system was highly regarded by Captain Griffiths.[31] On its first deployment, when on a gunfire support mission conducted after replacement of gun barrels, *Hobart* fired against a target with a range of 24,100 yards and the first rounds fell within 150 yards, being 800 yards inside the maximum range of the gun.[32] But the high usage demands placed on the guns produced defects, and all ships had to conduct repairs in order to remain operational.[33] *Brisbane*'s first deployment was affected by a greater than normal number of gun defects, which Grey surmised was possibly the cause of *Brisbane*'s expenditure of ammunition being well below that of earlier DDG deployments.[34] On one occasion *Brisbane*

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27 ibid pages 206-208. Grey provides the background for the deployment of *Vendetta*, which amongst other factors included the need to provide maintenance for the DDGs in Australia as well as demonstrate to members of the RAN that the DDGs were not the only ships in its fleet capable of undertaking such tasks. Although the USN assisted with logistic matters, the ship was an orphan in its support system.

28 Ken Doolan, *Steel Cat (the Story of HMAS BRISBANE)* Queanbeyan: Grinkle Press, 2009, page 62

29 Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972* pages 138-196. See also: Marolda, *By Sea, Air, and Land : An Illustrated History of the U.S. Navy and the War in Southeast Asia*, pages 76-78

30 Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972*, page 196. For a more detailed summary of the Vietnam workup training undertaken by *Brisbane* see: Doolan, *Steel Cat (the Story of HMAS BRISBANE)* pages 68-70

31 Interview with Rear Admiral Guy Griffiths, 13 and 19 January 2012. Page 2

32 Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972*, page 151

33 ibid page 146

34 ibid page 204

suffered a catastrophic explosion in its forward gun caused by faulty ammunition,[35] a problem which was not confined to the RAN and resulted in the USN ordering all 5/54 gun firings to cease until an investigation into defective propellant was completed.[36]

In terms of acknowledging, from an RAN perspective, how highly it regarded the DDGs as fighting ships, and how well *Perth* had measured up against the USN on combat operations in gaining the best from the ships, its commander, Captain Doyle is quoted as saying:

> "To demonstrate to both ourselves and others that we could fight this sophisticated weapon of war just as well as the Americans…we were able to prove the capabilities of the DDG which I believe to be perhaps the best bang per buck defence equipment purchase we have ever made."[37]

In the Vietnam War, the USN found that the RAN was a valuable ally capable of making meaningful contributions to operations. On its first deployment, *Hobart* was placed in command of Task Unit 77.1.1 which included USS *Fechteler.* Grey notes that "…this was a sign of the confidence placed on the Australian captain and his ship…"[38] and Griffiths is quoted as remarking that this positively showed "…the degree of integration which is being achieved during this tour of duty with the Seventh Fleet." As *Perth* began the last three weeks of operations on its first deployment, Captain Doyle noted in his Report of Proceedings of March 1968 that "…I was very proud to receive on behalf of the ship, high praise for *PERTH's* performance by the Commander Seventh Fleet."[39]

The demonstrated early performance of *Hobart* and *Perth* set the ongoing standard for the RAN's participation, and the USN's senior leadership was impressed by Australia's ships. In recognition of their professionalism, *Hobart*'s first deployment contribution was honoured by

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35 Doolan, *Steel Cat (the Story of HMAS BRISBANE)* page 208. The gun was removed and later replaced by the USN at its Subic Bay base in the Philippines. In the interim, the ship operated without its forward gun.

36 Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972*, page 148

37 ibid page 169

38 ibid page 150

39 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1968 to December 1969,* AWM78-292-6 Canberra: Australian War Memorial. Page 223. On completion of *Brisbane's* first deployment in September 1969 it received a similar highly complementary acknowledgement of its performance with the US 7th Fleet. See: Doolan, *Steel Cat (the Story of HMAS BRISBANE)* page 64

award of the US Navy Unit Commendation.[40] *Perth* was awarded the same honour after its first,[41] and honoured further for its second deployment with award of a US Navy Meritorious Unit Commendation.[42] On departure of *Brisbane* from its operations with the US 7th Fleet, which concluded the RAN's Vietnam deployments, the Commander-in-Chief Pacific Fleet, Admiral Clarey, highly praised the RAN's efforts in Vietnam operations. In a message to CNS Peek, he said:

> "Since Hobart joined the Cruiser-Destroyer group SEVENTHFLT on 10th March 1967, your ships have carried out their tasks in a superb manner. The professional associations between our Navy men in an often hard-fought and unpopular war will doubtless survive as the most lasting tribute to this effort. You have my sincere appreciation for your uniformly outstanding performance of the ships, officers and men of the Royal Australian Navy. Well done."[43]

Operational Matters – The Gulf War Theatre (1990-1991)

RAN combat operations in the 1990/91 Gulf War were shorter than those it conducted in Vietnam, but the defeat of Iraq lead to the RAN having a near continuous presence in the Arabian Gulf from that time.[44] The threat posed by Iraq was considered to be multi-dimensional in that it had acquired advanced Soviet and French weapons to equip its forces[45] and possessed naval mines against which defence would be needed.[46] Precautions also had to be taken against the possibility of chemical and nuclear weapons.[47] Through being equipped with Exocet which had proven lethal in the Falklands War, the Iraqi air force was regarded as a

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40 Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972*, page 155

41 ibid page 169

42 ibid page 196

43 "US Admirals Praise Work of RAN in Vietnam," *Royal Australian Navy News,* 15 October 1971, Vol14 No21, Page 1. *Brisbane* was awarded the Gloucester Cup for its performance as the last Australian warship to serve in the Vietnam conflict. See: Doolan, *Steel Cat (the Story of HMAS BRISBANE)* page 83

44 Jones, "1991-2001: A Period of Change and Uncertainty," 239-268, page 267

45 C. J. Oxenbould, "Maritime Operations in the Gulf War," *Journal of the Australian Naval Institute,* 18, May Number 2, 1991, 33-39, page 33

46 ibid page 37. Both the USS *Tripoli* and *Princeton* were struck by mines causing significant structural damage.

47 ibid page 35. The prospect of having to deal with nuclear contamination was trained for and measures applied when hostilities commenced.

particularly dangerous threat. [48] As with Vietnam operations however, the RAN would not have to cope with submarines.[49]

Seven days after Iraq invaded Kuwait, and one day before the official announcement made on 10 August 1990 of commitment of the ADF and RAN ships to Gulf War operations, the Maritime Commander, Rear Admiral Ken Doolan, received a 'warning order' from Defence Headquarters in Canberra.[50] Doolan had to choose ships from those available most suited to the type of operation, which required ships to have both a medium range missile capability as well as a close in weapon system (CIWS). The first ships, FFGs *Darwin* and *Adelaide*, were fully equipped, but the later ships were to be *Brisbane* and *Sydney*, which both had to be provided with CIWS in the time available.[51]

After a weekend of preparations, the FFGs sailed on Monday 13 August,[52] followed a day later by their support ship *Success*.[53] After they departed, the ships conducted intensive training under the direction of Commodore Don Chalmers involving considerable support from the RAAF in simulating the air threat. Captain Russ Shalders was quoted as saying: "the transit to Western Australia and beyond as far Cocos Islands was a masterpiece of operational intensity. In my experience it was the most demanding and professionally stimulating period of naval

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48 For a summary of the RN's experience see: Sandy Woodward, *One Hundred Days: The Memoirs of the Falklands Battle Group Commander*, ed. Patrick Robinson London: HarperCollins, 1992, page 223. In practice, the threat represented by the Iraqi air force proved to be overstated and the USN and other allied forces quickly achieved air-superiority. See: Edward J. Marolda, *Shield and Sword: The United States Navy and the Persian Gulf War*, ed. Robert John Schneller Washington: Washington : Naval Historical Center, Dept. of the Navy, 1998, page 208

49 Ken Doolan, "The Gulf Challenge," in *Maritime Power in the 20th Century - the Australian Experience*, ed. David Stevens (St Leonards, N.S.W: Allen & Unwin, 1998), 199-214, page 201

50 ibid page 200. The 'warning order' was a way of ensuring that preparations could commence based on a probable course of action to be undertaken, but that knowledge of prospective operations was to be kept confined to those who needed to know, and not to be made public.

51 Doolan, *Steel Cat (the Story of HMAS BRISBANE)* pages 122-129. Doolan provides a comprehensive summary as to how he selected the ships, which included his strong desire to have a DDG present because, other than the lack of CIWS, it had superior operational capabilities. *Brisbane* was also the most available DDG. He is critical of Australia's senior defence civilian leadership, which he regarded as not understanding the need for, and not obtaining the funding needed to equip ships to meet real threats. When presented with a clear government decision to participate in an unplanned high-end complex combat situation, Doolan considered they continued to lack urgency in expediting the necessary resources and approvals to meet operational deadlines.

52 R. E. Shalders, "The Enforcement of Sanctions by the Multinational Naval Force - an RAN Perspective," *Journal of the Australian Naval Institute,* 18, May Number 2, 1991, 15-22, page 15. *Darwin* was in a major maintenance period, which included changing its gas turbine engine.

53 Doolan, "The Gulf Challenge," 199-214, page 200

activity I'm ever likely to be involved in."[54] In contrast to the evolving standard of workup provided to ships for their Vietnam deployments, the training delivered by the Fleet Training Group now met the operational standard required, [55] and on arrival in the Gulf area of operations the RAN's ships commenced boarding and surveillance operations. Shalders did note that the advanced training they had received did not deal with boarding operations, which they were to spend most of their time conducting in an effort to enforce the blockade of Iraq.[56]

As the first ships deployed, Doolan and the Naval Support Commander[57] were conscious of the need for RAN logistic support when in theatre,[58] and to this end RAN Logistic Support Elements were established in Muscat and elsewhere so that the RAN was not dependent upon the support of others.[59] This required coordination between multiple authorities and much air support by the RAAF in providing important stores.[60] Doolan considered the "…logistics command arrangements too fractured and some unnecessary delays were incurred."[61] From that experience however, and as will be seen, it is possible to see that the RAN's understanding of operational logistics had matured considerably since its deployments to Vietnam.

Chalmers quickly applied considerable effort in establishing effective working relationships with his USN counterparts, including working with the USS *Independence* carrier Battle Group which greatly valued the Australian presence.[62] Whilst it might have been expected that the US was grateful of any allied support in conducting operations to blockade Iraq, there was particular senior level appreciation by the USN for Australia's naval participation and the professional manner in which it was being provided. On a visit to the region by the CDF (General Gration), Vice Admiral Mauz was very positive in expressing his appreciation of the

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54 D. M. Horner, *The Gulf Commitment: The Australian Defence Force's First War* Carlton, Vic.: Melbourne University Press, 1992, page 42. Shalders was the commander of *Darwin*.

55 ibid page 54

56 ibid page 55. Horner also notes that the RAN was able to benefit from the expertise of the US Coast Guard in learning boarding operations, which also lead to the RAN learning how to utilise fast roping insertion of boarding teams from a helicopter. See also pages 87-88.

57 ibid page 39. Rear Admiral Anthony (Tony) Horton was the Naval Support Commander and a former commanding officer of *Hobart*.

58 Doolan, "The Gulf Challenge," 199-214, page 211

59 ibid pages 211-212

60 ibid page 211

61 ibid

62 Horner, *The Gulf Commitment: The Australian Defence Force's First War* page 56

RAN Task Group's operational standard and remarked that "… the Australian ships …had won the confidence of the US carrier Battle Group… and that he was keen to continue the relationship if hostilities developed."[63]

Surface combatants of the second Task Group consisted of *Brisbane* and the FFG *Sydney*, with Commodore Christopher Oxenbould[64] as the Task Group commander, who embarked in *Brisbane* with a small staff. Oxenbould was to succeed Chalmers who would return to Australia and prepare for the eventuality of a further force rotation. With the demise of *Melbourne* in 1982, the RAN had lost the use of dedicated staff support facilities available in a large ship and had adopted ad-hoc sub-optimal methods to support an afloat commander. As shown in Chapter 2, the DDGs were not designed by the USN (neither were the FFGs) to support such arrangements, and the RAN was forced to improvise.[65] The new and technologically advanced Maritime Headquarters in Sydney provided a good command centre for Doolan,[66] but the Gulf War demonstrated once more the value of having a senior officer available as the on-scene national commander able to interact with those from other nations and direct Australia's naval operations in that theatre.

As Oxenbould became familiar with his new responsibilities and developed relationships with his international counterparts,[67] Doolan also visited the theatre where he held discussions with, amongst others, a personal friend, Rear Admiral March,[68] commander of the USN carrier Battle Group.[69] It was clear to Doolan and Oxenbould that March wanted the Australians to work with his Battle Group[70] which serves to emphasise the degree to which the RAN and USN had grown to respect each other's professional abilities.

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63 ibid page 114

64 ibid page 125. Oxenbould had been in command of *Perth* which was on a South East Asian deployment. He flew back to Australia from Singapore and was promoted from Captain to Commodore to take up his duties. He was a graduate of the USN War College.

65 When nominated as the Gunline Commander for Vietnam operations, Captain Loosli as commander of *Brisbane* used his Executive Officer and senior communications sailor as an ad-hoc planning staff to assist him in planning the associated operations. See: Doolan, *Steel Cat (the Story of HMAS BRISBANE)* pages 75-76.

66 Doolan, "The Gulf Challenge," 199-214, page 207

67 Oxenbould, "Maritime Operations in the Gulf War," 33-39, page 33

68 Horner, *The Gulf Commitment: The Australian Defence Force's First War*, page 131

69 ibid page 129

70 ibid

The ability of the RAN not only to successfully integrate with such a powerful naval force as represented by the *Independence* Battle Group, but to be sought out as a trusted and competent addition to its capabilities during combat operations, represented a professional relationship well beyond that which existed prior to RAN operations in Vietnam. The high mutual regard developed by each Navy for the other which had formed through their mutual operational experiences in Vietnam had been nurtured in the intervening years, and was clearly evident once more in the Gulf War.

When hostilities against Iraq commenced, *Brisbane* and *Sydney* were assigned to Battle Force Zulu, which comprised multiple USN carrier Battle Groups[71] stationed far forward in the Gulf.[72] In that location, there was concern by senior USN commanders that the carriers would be vulnerable to air attack emerging from gaps in the Zagros Mountains, and the RAN ships were deployed to the most northern positions defending the Battle Group, becoming known as the "Zagros Gateguard".[73] Oxenbould, in reflecting upon the significance of this role and reinforcing the degree to which the RAN was valued by the USN, is quoted as remarking that "this tasking demonstrated considerable trust by the USN in RAN capabilities."[74] *Brisbane* provided important airspace management and control of friendly aircraft as well as the essential early warning needed to defend against any potential attack on the carriers.[75] *Sydney* was no less important in its surveillance and combat search and rescue roles.[76]

With Gulf War hostilities complete and the cease-fire taking effect on 28 February 1991, the nature of operations for *Brisbane* and *Sydney* changed, and on 14 March 1991 they departed the area of operations to return to Australia.[77] Jones remarks that the RAN's ships had again contributed to Australia's reputation as a reliable ally, and its performance had again demonstrated its very high standards. In a departure message, the US Commander of Middle East Force (Rear Admiral R.A.K. Taylor USN) said:

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71 Oxenbould, "Maritime Operations in the Gulf War," 33-39, page 36

72 Marolda, *Shield and Sword: The United States Navy and the Persian Gulf War*, page 209. A graphical representation of how Battle Force Zulu was arranged geographically and the location of *Brisbane* and *Sydney* is provided by Horner. See: Horner, *The Gulf Commitment: The Australian Defence Force's First War*, page 179

73 Marolda, *Shield and Sword: The United States Navy and the Persian Gulf War*, page 209

74 ibid

75 Horner, *The Gulf Commitment: The Australian Defence Force's First War*, pages 177-178

76 ibid pages 182-183

77 Oxenbould, "Maritime Operations in the Gulf War," 33-39, page 39

> "Your outstanding contributions in carrying out multiple and diverse tasking since your arrival have been a cornerstone of Middle East Forces capability. Serving at the tip of the spear for Allied navies during operation DESERT STORM, you not only protected Carrier Battle Groups, but also served as an integral link to Middle East Force in support of Multinational Maritime Intercept Operations. You should take exceptional pride in your efforts…" [78]

Command and Control – From Vietnam to the Gulf

Australian and US high level command and control arrangements for the DDGs and *Vendetta* whilst on Vietnam operations was relatively simple. They provided for the flexible operational use of the ships whilst ensuring that the RAN had sufficient awareness of circumstances, the arrangement being agreed between the RAN and USN[79] through CNS McNicholl and the Commander in Chief of the US Pacific Fleet, Admiral R.L Johnson.[80] The ships remained under CNS' full command and under the administrative control of the RAN Fleet Commander,[81] but operational control was delegated to the Commander US Seventh Fleet, and thence to the Commander Seventh Fleet Cruiser-Destroyer Force.[82] Notwithstanding, Australian national policy placed limitations on where the ships could be operated while under USN control, which for instance excluded operations associated with Taiwan and Cambodia.[83]

These higher level arrangements proved to be workable between the navies, but coordination with the USAF was inadequate. Peter Purcell was on watch as the missile system control officer in *Hobart* at the time of its being attacked by a USAF aircraft returning from operations over North Vietnam, and considered the US Rules of Engagement were inappropriate for the nature of the conflict.[84] *Hobart* was prevented from engaging in self-defence until actually attacked, the consequence being that two of its crew were killed and others injured, and the

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78 Jones, "1991-2001: A Period of Change and Uncertainty," 239-268, page 265. Taylor had been closely associated with the RAN's activities. See also: Horner, *The Gulf Commitment: The Australian Defence Force's First War*, page 185

79 Alastair Cooper, "1955-1972: The Era of Forward Defence," in *The Australian Centenary History of Defence Volume III. The Royal Australian Navy*, ed. David Stevens (Melbourne: Oxford University Press, 2001), 181-209, pages 204-205.

80 Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972*, page 139

81 Ships transferred to command by the Australian Fleet Commander when detached from the US 7th Fleet area of operations, transferring back again subsequently.

82 ibid page 131

83 ibid page 141

84 Interview with Rear Admiral Peter Purcell, 23 April 2012, page 20

ship removed from operations to conduct major repairs.[85] Captain Shands, the commander of *Hobart*, reported that:

> "…we were aware that there had been incidents further south…of friendly aircraft firing upon naval units… one expects these things to happen…but I believe the lesson is that it's more likely to happen when command of units is split and there are two different organisations involved in one operation."[86]

Shands was unimpressed with the changes to procedures undertaken by the USN to improve matters and he communicated his disquiet to senior members of both the USN and RAN. Captain David Leach, the commander of *Perth* due to relieve *Hobart*, was similarly informed and thereby forewarned.[87]

Command and Control arrangements in the Gulf War[88] were more complex than for Vietnam. Whereas in the latter theatre the RAN was dealing almost exclusively with the USN, in the Gulf theatre, in addition to ships from the USN, there were eventually 60 ships from 12 countries assigned to the initial Maritime Interception Force.[89] On this occasion, both Task Groups deployed by the RAN were each commanded by a Commodore, which helped ensure the RAN had appropriate influence at senior levels of the coalition.[90]

Since Vietnam, the ADF's highest level command arrangements had progressively adjusted to its Joint doctrine for military operations. Horner notes that operational command of RAN units was exercised through the Maritime Commander in Sydney who had responsibilities to the CDF. [91] Although the CNS (Vice Admiral Hudson) was no longer in the chain of command for

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85 The attack on *Hobart* is covered in some detail by Grey. See: Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972*, pages 174-185

86 ibid page 181

87 ibid page 183

88 Horner, *The Gulf Commitment: The Australian Defence Force's First War* pages 71-72. Amongst other measures taken to be considerate of national sensitivities, the allies used the term 'Arabian Gulf' instead of 'Persian Gulf'.

89 Marolda, *Shield and Sword: The United States Navy and the Persian Gulf War*, page 86. Oxenbould noted that: "At the height of the conflict the forces comprised six aircraft carriers, two battleships, 15 cruisers, 67 destroyers and frigates, and over 100 logistics, amphibious and smaller craft." See also: Oxenbould, "Maritime Operations in the Gulf War," 33-39, page 33

90 Commodore Chalmers was the Commander of the first RAN Task Group deployment, and Commodore Oxenbould that of the second deployment. The CNS was Vice Admiral Hudson and the Maritime Commander was Rear Admiral Doolan. All of these officers had commanded a DDG – see Appendix G.

91 Horner, *The Gulf Commitment: The Australian Defence Force's First War*, page 66

operations, he remained responsible for professional advice to CDF and the government, and for directing the resources of the RAN to meet its commitments.[92] Other ADF commanders were responsible for providing supporting elements to the operation outside of Doolan's chain of command and he found his reporting requirements to both the CDF and CNS to be onerous and distracting.[93] Doolan felt that a single chain of command between himself as the operational commander, who would command all participating elements from all three services, and to the CDF, would have been a better arrangement.[94] We have seen the fatal consequences for *Hobart* when disunity of command occurred between the USN and USAF, which suggests that Doolan's instinct to ensure there was clarity of command was a sound assessment.

Doolan also notes that unlike its method in Vietnam, Australia initially did not intend to delegate operational control of its ships to an allied commander. A form of loose coordination was instead achieved through meetings convened between senior officers, but this had the weakness of not ensuring uniformity of purpose between all those nations present and inhibited alignment of their rules of engagement. Doolan considered that some countries were more concerned with national prestige than operations, which occasionally introduced dangerous circumstances.[95] Doolan also notes that the ADF was very careful to ensure it had effective rules of engagement in the Gulf War, and especially that RAN ships had the right to defend themselves if they considered they were under attack.[96] The lesson from Vietnam had been heeded.

For the ensuing Gulf combat operations, Rear Admiral Doolan as Commander Task force 627, commanded Commodore Oxenbould who Commanded Task Group 627.4. As operational circumstances dictated, Doolan then assigned Task Group 627.4 to the tactical command of the individual USN commanded Task Forces 151 (Middle East Force), or 152 (Maritime Interception Force), or 154 (Battle Force Zulu).[97] Through this flexible, well understood and

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92 ibid
93 Doolan, "The Gulf Challenge," 199-214, page 213
94 ibid
95 ibid pages 202-203
96 Doolan, *Steel Cat (the Story of HMAS BRISBANE)*, page 137
97 Jones, "1991-2001: A Period of Change and Uncertainty," 239-268, page 264. Command and control arrangements were adapted to meet the needs of changing operational circumstances but Australia always maintained national command of its ships. See also: Oxenbould, "Maritime Operations in the Gulf War," 33-39

practiced arrangement of commanding naval forces, Australia always retained command of its ships, but it also ensured they were tactically effective in the allied theatre of operations.[98]

Prior to arrival of the RAN's ships, Commodore Robert Walls and Captain Timothy Cox of the RAN were sent to the theatre in order to shape Australia's participation and provide advice to the CDF, CNS and others in developing the RAN command and supporting arrangements to be adopted.[99] Walls had previously developed friendly professional relationships with several other senior officers in the multi-national force and used that influence in gaining desired outcomes for Australia.[100] One beneficiary of those relationships was Commander Anthony Flint of the RAN. He was reassigned at short notice from his staff position in Canberra to the staff of Vice Admiral Mauz (Commander US Seventh Fleet), not the least because Flint had previously been on exchange service with the USN and had gained the Admiral's confidence.[101] Flint became a surface warfare watch officer on the Admiral's staff: "...in a privileged position to gain an overview of Gulf operations and give …the Australian Maritime Commander early warning of US attitudes as well as ensure that the US headquarters was aware of Australian capabilities."[102]

Communications and Intelligence Support Arrangements - From Vietnam to the Gulf

Communications and intelligence support arrangements were essential to successfully embedding RAN units in USN theatres of operations in Vietnam and the Gulf. On *Hobart*'s first deployment to Vietnam, significant changes to security procedures were required by the US naval communications network in order for the ship to receive USN intelligence reports, which would otherwise have not been permitted. Ultimately, authorisation was given by the Chief of Naval Operations.[103] The volume of message traffic necessary to support operations as experienced by *Hobart* was reportedly much higher than normal, and it "…had to handle a

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98 Doolan amplifies the details of this arrangement. See: Doolan, *Steel Cat (the Story of HMAS BRISBANE)* page 135 and 138

99 Horner, *The Gulf Commitment: The Australian Defence Force's First War*, pages 67-72

100 ibid page 68

101 ibid page 69

102 ibid pages 69-70. Flint had served in DDGs as a warfare officer and later commanded *Brisbane* – see Appendix G.

103 Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972*, page 142. See also: Archives Branch US Naval History and Heritage Command, *DISCLOSURE OF INFO TO HMAS HOBART AND PERTH (CNO Message 102009Z JUL 67 to CINCPACFLT for Information COMSEVENTHFLT, FICPAC) SECRET NOFORN (Declassified IAW: E.O. 12958 & OPNA VINST 5513.16 (SERIES)*US Naval History and Heritage Command)

minimum of 1000 messages a day…"[104] Throughout the Vietnam War, RAN ships had to borrow USN equipment to provide encrypted voice communications and active aircraft transponder decoders which had not been procured by the RAN for its own use.[105]

Using secure high capacity satellite communications, absent in Vietnam, Doolan's Headquarters in 1990 could rapidly share its highly classified intelligence with the USN, the RAN's ships in the Gulf, other Headquarters of the ADF and selected partners. The RAN also gained access to the USN Joint Operational Tactical System (JOTS), [106] which automatically displayed the classified data received on a computer screen in the C-I-C of the RAN's ships. This provided a significant operational and technical improvement, also lacking in Vietnam, because it overcame the need to manually re-plot information from paper printout, thereby being considerably more valuable through its timeliness. The proficiency which the RAN had gained in its use of the Link 11 datalink was noted by Shalders as being an essential capability for keeping abreast of Gulf operations.[107] After the Gulf War, and reflecting his experience as a senior commander, Doolan remarked that "information and communications technologies are likely to continue to revolutionise the communications and intelligence aspects of warfare."[108] His remarks, and especially his use of the word 'revolutionise', crystallise just how much conceptual and technical progress had been made in communications and intelligence support methods since the RAN's Vietnam deployments, but similarly demonstrate that the RAN had taken steps to meet the challenges presented.

Broad Implications of Vietnam and Gulf War Operations for the RAN

The RAN learned much about contemporary naval warfare from its Vietnam War operations. In so doing, it impressed the USN with just how professionally the RAN could use the DDGs in the ultimate testing circumstances of combat, which is where it mattered most. The RAN's demonstrated operational competence in Vietnam became the foundation of how positively the USN continued to respect its ally.

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104 Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972*, page 143

105 ibid page 156. Active decoders were used to assist in the identification of friendly aircraft.

106 Horner, *The Gulf Commitment: The Australian Defence Force's First War*, pages 82-83

107 Shalders, "The Enforcement of Sanctions by the Multinational Naval Force - an RAN Perspective," 15-22, pages 16-17. Shalders noted that even with up to 16 other units participating on Link 11, his small air picture compilation team in *Darwin* could confidently keep awareness of about 100 air tracks. This was a significant improvement over that experienced by DDGs in Vietnam where manual tracking was required.

108 Doolan, "The Gulf Challenge," 199-214, page 214

The RAN's proficiency had formed through its adoption of the RN's high operating standards, which may have unintentionally been placed at risk through its acquisition of the DDGs with their complete difference from RN ships. Formation of the RAN Fleet Training Group in the late 1960s, initially with low levels of DDG expertise in supporting ships working up for Vietnam operations, by 1990 had transformed into high skills in thoroughly preparing ships for Gulf War operations, albeit not initially addressing boarding operations for the first deployment. The RAN used the DDGs to help transition from an RN standard of operational excellence to one of its own which met its own needs, but which nevertheless continued to be considered highly by the USN.

The relatively simple command and control arrangements between the RAN and USN in Vietnam became more complex in the Gulf by virtue of Australia's desire to have a more direct national chain of command, as well as through having a large number of nations present with each having their own requirements. For Gulf operations, at the ADF operational and strategic levels, Doolan was critical of the lack of a single chain of command from himself to the CDF for his responsibilities. At the tactical level afloat however, arrangements between the RAN and USN worked most satisfactorily, once again demonstrating the value of delegating authority and giving clarity of purpose to the on-scene commanders.

By the time of the Gulf War, and by virtue of the DDGs having become the most capable surface combatants in the RAN, the importance of service in them can be seen to have exerted itself on its senior leadership. Chalmers and Oxenbould the RAN's Task Group commanders, Doolan their Flag Officer superior ashore, Horton the Naval Support Commander, and their senior – Hudson, the Chief of Naval Staff, had all commanded a DDG. Through, and since Vietnam, the RAN's leadership had learned about the USN's culture and its way of war, and both navies had nurtured their relationship to mutual benefit as demonstrated in the Gulf War.

Advances in communications and information technology had fundamental ramifications for naval operations. As was shown in Chapter 4, the RAN's initial adoption of NCDS was more about having the ability to support its ships technically than clearly understanding how naval warfare was evolving. But acquisition of NCDS brought greater RAN contact with the digitising USN and, with it, a better understanding of how operationally pervasive the USN's doctrinal concepts of networking were. By the time of the Gulf War, the medium speed

communications used by the RAN in Vietnam was being replaced by high capacity satellite communications which, when integrated with computerised intelligence processing systems, was capable of automatically providing vast quantities of data to ships anywhere there was satellite coverage. The RAN's transition to such capabilities had aided its ability to work with its major ally, and the Gulf War demonstrated that it had taken the right steps.

Combat operations undertaken by the RAN in both the Vietnam and Gulf Wars demonstrated it could work very effectively with the USN. The sincere accolades received by the RAN from the USN's senior leadership during and on cessation of those conflicts were high by any measure, and showed just how much the USN both valued and enjoyed working with its considerably smaller, but highly regarded ally.

Impact on RAN Operational Matters

A warship has to be able to fight and win. To do this, its fighting capabilities must typically be superior to those of others. The operational standards to which a Navy must train and which it must apply in combat emerge from its personnel having a comprehensive understanding of the naval operational art gained through learning, training and practice. But the organisation and its members also need actual operational experience to build confidence in their own expertise. Staying at sea so as to keep sustained pressure on a foe is also essential, and requires methods of ensuring that ships are capable of underway replenishment. Critical too, and potentially hardest to achieve over long and stressful periods, is ensuring that the physical endurance of the crew does not become a limiting factor in operations. The following paragraphs examine these factors in regard to the DDGs, with emphasis on how their commanders and crews contributed collectively to achieving the required operational results.

Fighting Ships

Ultimately the impact of a warship on a Navy can be gauged by assessing the positive differences made to its operational capability and performance. In the case of destroyers and frigates, their purpose during this era was to be fighting ships and contribute to naval combat power.[109] In this role they were intended to be exposed to danger and to inflict damage on opposing forces. For the morale of the crew, it was therefore important to have confidence that the fighting performance of their ship was superior to that of those they might have to

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[109] Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2010*, 2nd ed. Canberra, ACT: Sea Power Centre Australia, 2010a, pages 138-139

confront. The evolution of warship design has led to their construction being akin to that of a complex machine operated by a team of people working inside its casing, which both protects them and its equipment while being able to engage the enemy.[110] Despite advances in technologies and techniques, people remain central to the fighting ability of a warship.

All three DDGs were commissioned in the United States. Captain Guy Griffiths was the commissioning Commanding Officer of *Hobart* and in 1967 had taken it on the RAN's first operational deployment by a destroyer to Vietnam.[111] He remarks "I had a ship with capabilities that were reliable, the gunnery system was accurate, for the first time in my life as a Gunnery Officer I had a fire control system which actually fired in the right direction and hit targets without a waste of ammunition."[112] As a person who had trained as a Long Course Gunnery Officer at the RN Whale Island Gunnery School, Griffiths' appreciation of this standard is noteworthy. He was critical of the RN gunnery systems with which he had become familiar in both the RN and RAN. He was impressed with the Tartar missile system and comments "I had a surface-to-air missile system which was extremely accurate…"[113] When on the Naval Staff before being posted to *Hobart*, Griffiths knew that the RN Seaslug did not perform and hoped the RAN would not acquire it.[114]

Griffiths believes that the DDGs were a "…quantum ahead from any other ships we had in commission…which means a quantum jump from what were RN designed ships…"[115] After its arrival in Australia, *Hobart* participated in Exercise SWORDHILT, and in comparison with RN County class destroyers that also participated, Griffiths notes "…there was no doubt…of the superior capability, flexibility, reliability and maintainability of the DDG – and Vietnam was not to change that opinion."[116] On completion of the exercise, the RN Flag Officer said to Griffiths

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110 The sense of teamwork pervades the accounts of WWII sea battles. See: David Stevens, "The Faceless Foe - Perceptions of the Enemy in Modern Battle," in *The Face of Naval Battle: The Human Experience of Modern War at Sea*, eds. John Reeve and David Stevens (Crows Nest, N.S.W.: Allen & Unwin, 2003), 263-284

111 G. Griffiths, "DDGs in Vietnam: HMAS Hobart 7 March to 27 September 1967," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 330-337

112 Interview with Rear Admiral Guy Griffiths, 13 and 19 January 2012. Page 2

113 ibid page 2

114 ibid page 44

115 ibid page 2

116 G. Griffiths, *DDGs in Vietnam: HMAS Hobart 7 March to 27 September 1967*, page 331

that he "…could not understand why they had bought that American rubbish."[117] But Griffiths' operational experience in Vietnam added weight to that gained in commissioning the ship and preparing it for operational service, and left him in no doubt as to it having been the right decision for Australia to acquire the Adams class. In overall terms, Griffiths observes "… the posting to *Hobart* was the highlight of my naval career."[118]

Lieutenant Robert Walls joined *Hobart* as it was building and went on its first Vietnam deployment. He later commanded *Brisbane* and eventually became the Vice Chief of the Defence Force (VCDF). As a Rear Admiral, Walls was Maritime Commander in the early 1990s, responsible for the RAN's entire operational performance and had strong views about the DDGs in terms of professional standards. He notes that he "…used them as a benchmark for the rest of the Fleet and assessed capabilities and capacities for what other people could or should or might be able to do or how they ought to perform in comparison against the DDG benchmark."[119] Walls found benchmarking other units against the DDGs a very useful tool in overseeing the activities of the Fleet and assessing its operational standards.[120]

Walls served in DDGs on several occasions and believes such service had a career-long influence on him. As one of those who had to make the ships perform, he believes they acted as a watershed for the RAN. He considers "…the DDGs principal impact on the RAN was it brought the Navy of age."[121] He remarks how the DDGs contributed to the RAN's learning how to fight again, for the first time since the Korean War, and how, as a consequence of the DDGs, the RAN had to make changes to those practices that had been in place from the time of its formation. The DDGs "…brought a maturity and a wiser approach to the way things were done. People had to think about the RAN for itself as opposed to being able to rely on the inherent abilities and knowledge of Admiralty Instructions and Queen's Regulations and whatever the RN had to offer."[122] In other words, the Navy had to adapt because the DDGs brought with them a need for new ideas and methods about fighting which had not been fully comprehended before they were acquired, and which included anti-air warfare with guided missiles, longer range surface gunnery and the employment of advanced sensors. In that

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117 ibid
118 Interview with Rear Admiral Guy Griffiths. Page 2
119 Interview with Vice Admiral Robert Walls, 6 October 2011. Page 32
120 ibid
121 ibid page 36
122 ibid

sense they contributed to changing the RAN's ideas of naval warfare. As we shall see, the roles played by individuals therefore contributed in terms of how the RAN learned to become different from the RN while calling upon the essential proficiency it had gained from that relationship.

Although he was reflecting upon earlier circumstances with the benefit of his considerable experience and maturity, Walls' insights also imply a realisation occurring amongst some that there was more to being a Navy than solely and competently operating advanced warships. His thoughts resonate with the historical opinion of James Goldrick, that the ability of the RAN to borrow via its relationship with the RN had masked the national foundations the RAN needed as a Navy, as distinct from those it needed for a Fleet.[123] Goldrick's premise is that being a mature Navy, and having a clear place in the nation's psychology, in practice requires a national will to achieve that status, because a nation's Navy is in fact a visible manifestation of its power. It encompasses a commitment to infrastructure and industrial capabilities and the political determination to direct resources into making a Navy fit for purpose within an overall defence strategy.[124] The premise has value in helping appreciate the two different but complementary major elements of the naval enterprise needed for it to operate effectively as a whole: an effective Navy aspires simultaneously to maintain competencies at both a national strategic and an operational level. A mature Navy therefore has to work to keep its political leadership supportive of its needs whilst concurrently meeting its own obligations for performance. In their different ways, Walls and Goldrick highlight how the RAN was still – at multiple levels - on a journey of learning and that the words 'girt by sea' in Australia's national anthem were not yet embedded deeply in Australia's national political consciousness in so far

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123 James Goldrick, "A Fleet Not a Navy; some Thoughts on the Themes," in *Southern Trident - Strategy, History and the Rise of Australian Naval Power*, eds. David Stevens and John Reeve (Crows Nest, N.S.W.: Allen & Unwin, 2001), 291-295

124 These factors were initially developed by Mahan See: A. T. Mahan, *The Influence of Sea Power upon History 1660-1805* London: London : Hamlyn, 1980. Eric Grove re-examined Mahan's factors and found them having continuing relevance to the 21st century. See: Eric Grove, *The Future of Sea Power* London: Routledge, 1990, Chapter 11

as it viewed and provided for its Navy.[125] It can also be inferred that the dependent relationship of the RAN with the RN had left its leaders unprepared intellectually to make the transition to self-reliance and Goldrick notes that one consequence of the RN's fulsome support meant that "… the leaders of the RAN were not in the position to develop their own understanding of what it was they had to do to foster the growth of a truly national navy."[126] Conversely, they were unhindered in being able to apply themselves to successfully achieving high levels of operational expertise on the part of the RAN.

The traditional approach to operating the fighting equipment of warships adopted by the RAN, based on RN methods, was changed by introduction of the DDGs. Lieutenant Ormsby Cooper had joined *Perth* as a WEEO while it was building, and became its Ikara installation liaison officer for its fit out on return to Australia.[127] During *Perth*'s first deployment to Vietnam, Cooper became a watchkeeping controller of the gunnery system because the gunnery senior sailor, whose task it should have been, was not sufficiently well trained to do the job.[128] Cooper's situation arose through a weakness in the DDG acquisition process in not providing training equipment in Australia to enable new crew members to become proficient in their responsibilities before joining their ship. For many operational crew members, 'on-the-job' training was all that was available until the NCDS was installed a decade later.[129] As Rear Admiral Peter Purcell notes, the DDG marked the entry of WEEOs into the tactical fighting of the ship - previously only the domain of seaman officers and sailors.[130] Of nine RAN surface combatant deployments to Vietnam, eight were conducted by the DDGs,[131] resulting in significant operational experience being gained by relatively few people of each naval sub-

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125 Given the different economic and other circumstances of each country over time, it is open to question whether the RAN will ever reach the same level of national consciousness within Australian society as did the RN within that of Britain. Goldrick considers that such a state could take a very long time for Australia. See: James Goldrick, A Fleet Not a Navy; some Thoughts on the Themes, pages 294-295. Also see: N. A. M. Rodger, *The Command of the Ocean : A Naval History of Britain, 1649-1815* London: Allen Lane in association with the National Maritime Museum, 2004, page 582.

126 James Goldrick, "A Fleet Not a Navy; some Thoughts on the Themes," in *Southern Trident - Strategy, History and the Rise of Australian Naval Power*, eds. David Stevens and John Reeve (Crows Nest, N.S.W.: Allen & Unwin, 2001), 291-295, page 294

127 Interview with Commodore Ormsby Cooper, 15 September 2011. Page 26

128 ibid page 22

129 Interview with Captain David Cotsell, 8 January 2013. Page 31

130 Interview with Rear Admiral Peter Purcell, 23 April 2012. Page 48

131 John Perryman and Brett Mitchell, *Australia's Navy in Vietnam - Royal Australian Navy Operations 1965-72* Silverwater, NSW, Australia: Topmill Pty Ltd, 2007. Pages 8-36. In 1972 the DDGs comprised 20% of the major surface combatants of the RAN – see thesis Appendix A.

specialisation, whose knowledge was important in sustaining the RAN from 1972 until its next combat operation in 1990/1991.

Commodore Richard Menhinick[132] qualified in Australia as a PWO in 1987. From that time he served in RAN DDGs and RN destroyers, and commanded RAN frigates which had all been equipped with digital combat systems and guided weapons. Menhinick was not in the RAN when the DDGs were acquired but had a wide range of experience that enabled him to draw conclusions about how well RAN practitioners had been able to take the original ships and develop them further to meet the needs which emerged over time. He is of the view, like Walls, that the DDGs were very important in terms of how the RAN evolved its fighting capabilities. He considers that the DDGs were "…an important evolution in us growing up… in actual fact a lot of what the DDGs forced us to do was in many ways (to become) an embryonic parent Navy in itself." [133] The term 'parent Navy' was used by Menhinick in terms of recognising that the RAN did not have the comprehensive support from the USN that it had enjoyed with the RN, and that it increasingly needed to be self-reliant in its knowledge of all aspects of the DDG platform and its systems. Menhinick notes that "…even in the setting up of Combat Data System Centre and the running of our own Australian NCDS system…we ended up with a much better program than the American NTDS…"[134] He considers that the RAN relationship with the USN was strengthened through the experience of the DDGs in that "…it also did a bit of breaking us from the UK which had to happen because we live in PACOM."[135] Menhinick has a similar view to others that acquiring the RN County class instead of the Adams class would have resulted in a much slower rate of change for the RAN.[136] In overall terms, Menhinick considers the DDGs to have been "…overwhelmingly positive."[137]

Sub Lieutenant Robert Hall was a commissioning crew member of *Brisbane* and then qualified as a Direction Officer through completion of the RN Long Course. Following that, he had served in the aircraft carrier HMS *Ark Royal* on operations when they were being followed by

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132 Menhinick was still a serving officer of the RAN when interviewed for this research.

133 Interview with Commodore Richard Menhinick, 12 July 2012. Page 3

134 ibid

135 ibid. PACOM is an abbreviation for the US Pacific Command, located in Hawaii, the Commander of which is responsible for all US operations in the Pacific area and the Indian Ocean. Menhinick was referring to the intimacy that has grown between the RAN and USN in that theatre of operations.

136 ibid

137 ibid page 33

Soviet naval forces in the North Atlantic. He had the knowledge and experience to compare and contrast the DDGs with similar RN capabilities. Hall considers that there was quite a clear fighting advantage gained by the RAN brought about by the DDGs. He notes that "…auto loading guns was probably a big thing, surface to air and surface to surface missiles[138] and that's huge when you think of what we had before."[139] Hall was referring to the fact that the medium calibre guns of RN-origin were still loaded by hand by sailors in the gunhouse of the mounting. In the DDGs the sailors oversaw operation of the automatic loading and operation of the gun which had a higher sustained rate of fire than those of the RN. Hall contrasted the advanced nature of the USN radars fitted to the DDGs, which had greater performance than other radars in service with the RAN and being generally of British or Dutch origin. He remarks "The long range height finding radars made a big improvement to what we had." [140]

As a further and important distinction, Hall remarks that the USN had a more advanced research program supporting the evolution of their warships which he thought was more comprehensive than anything he had otherwise seen.[141] The need to continue to develop the capabilities of warships after they are introduced into service if they are to remain relevant against changing threats is self-evident. But resources are required and priorities have to be developed. Such development by the RAN had previously been at a similar rate to that of the RN, on which it was somewhat dependent, but the USN rate of technical change was faster. As observed by Captain Ian Pfennigwerth, the RAN was slow to learn about how to exploit these ships to their fullest capabilities after their NCDS conversions.[142] He states "We needed people who could look at really squeezing the ship until its pip squeaked to get the best out of it and we never did it... we were always satisfied with good results but we never pushed for a great result, and when we did, you got your head kicked."[143] Pfennigwerth is of the view that the senior leadership of the RAN was slow to learn how to utilise fully the capabilities of the DDGs and that there was not a universal culture of trying new ideas. The then senior leadership of the Navy were a product of their own career development, and Jason Sears highlights that "…the RAN promotion system was self-perpetuating and rewarded safe, conservative

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138 Tartar and SM-1 both had surface-to-surface target engagement capabilities as well as surface-to- air (which was their primary purpose).

139 Interview with Commander Robert Hall, 5 September and 13 October 2011. Page 40

140 ibid

141 ibid

142 Interview with Captain Ian Pfennigwerth, 26 July 2012. Page 49

143 ibid page 60

officers."[144] It would therefore have been most unlikely that the cultural attributes which Pfennigwerth supported would have been present. Nonetheless, his remarks imply that officers serving in DDGs, who were then some distance removed from the RAN's most senior ranks, did see reason for change and were not deterred from thinking about such matters, and that their intellectual capital was enhanced by that experience.

Maintaining Operational Standards

After the Vietnam War, and during and after the Cold War, the RAN was involved in deployments to many parts of the Asia-Pacific region and to the Middle East.[145] It conducted exercises with foreign navies and supported Australia's foreign and defence policy objectives through deployments to areas of security concern as well as building up friendly relations. In 1971, as *Brisbane* was completing the last RAN DDG Vietnam deployment with the USN 7th Fleet and the RAN was being praised by the USN for its work in Vietnam,[146] *Hobart* was part of a task group led by *Melbourne* deploying for the first of the new RIMPAC exercises being conducted in USN training areas near Hawaii.[147] The DDGs were typically delegated with task group command roles, which contributed to their crews maintaining and enhancing the skills needed to meet the most advanced naval warfare challenges. Other classes of ships were not as capable and did not have the same opportunities as the DDGs to achieve such results and, as Walls remarks, DDG performance became the professional standard to be applied in the RAN.

Captain Christopher Ritchie commanded *Brisbane* in the first Gulf War and became Chief of Navy (CN) in 2002. He notes how those with Vietnam experience sustained the RAN's operational expertise post-Vietnam and remarks that the DDGs "…carried the Navy through that Vietnam experience and those people who were still there in 1990 were the …only … people who had any operational experience."[148] The crews of the DDGs provided a foundation

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144 Jason Sears, *Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50,* page 296

145 For a summary of RAN operations in this period see: David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, Chapters 9 and 10

146 "US Admirals Praise Work of RAN in Vietnam," *Royal Australian Navy News,* 15 October 1971a, Vol14 No21, Page 1

147 "RAN Ships Sail for Hawaiian Exercise," *Royal Australian Navy News,* 15 October 1971b, Vol14 No21, Page 6. See Appendix K for an examination of RIMPAC and its relationship to the DDGs

148 Interview with Vice Admiral Christopher Ritchie, 30 January 2013. Page 2

on which to build as the RAN prepared to re-enter combat operations in the Gulf War.[149] The effect of the DDGs was prominent at the more advanced levels of naval warfighting and Ritchie notes:

> "…I think that they introduced the RAN to the higher level of operational capability…to the next level. I think it kept us with an operational capability all through those periods of nothing really going on except going to RIMPAC and going up top,[150] and…through its experience…in the Gulf War of 1991, it brought us back to an operational model…which I think has lasted for the 20 odd years since then." [151]

Ritchie believes there was little sense of operational urgency about the RAN in those intervening years but that it was reinstated after the RAN experience in the Gulf War and he remarks "…after 1991…there was much more sense of purpose again about what the Navy did, in a lot of ways that took a lot of fun out of it because I think people were mostly deployed operationally from the early-90s until today."[152] Ritchie went on to say he agrees with the proposition that on the demise of *Melbourne*, the DDGs became the capital ships of the RAN: "…I think de facto that became the case. And I think everybody did think that."[153] One consequence being that the prestige of the DDGs increased in the RAN order of battle, as did the expectations by higher authority of the professional performance of their crews. The ships which had initially been the odd-ones out in the RAN's RN-origin force structure of the mid-1960s had indisputably become postings of choice for officers with higher career aspirations who wanted to gain from that experience. The ships' roles as professional benchmarks and as agents for change were not explicitly acknowledged, but the impact of the DDGs on the Navy was evident in their tangible value to such people.

Vice Admiral Donald Chalmers commanded *Perth* as a Commander in 1982 and became CN in 1997. Like Menhinick, Chalmers notes that the DDGs brought the RAN closer to the United

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149 The RAN only deployed a DDG and FFGs as surface combatants to the first Gulf War. See: David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, pages 261-266.

150 'Up Top' was a slang term used by members of the RAN to mean deploying to anywhere in the Far East. Grey used the term as the title of his official history. See: Jeffrey Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972* St. Leonards, N.S.W: Allen & Unwin in association with the Australian War Memorial, 1998 . Preface

151 Interview with Vice Admiral Christopher Ritchie, page 2

152 ibid

153 Interview with Vice Admiral Christopher Ritchie, page 44

States: a process he thought was already in progress but was enhanced through the ability of DDGs to fit seamlessly into a USN force.[154] Chalmers believes that the DDGs gave the RAN an understanding of Battle Group operations and notes "We were able to hone our skills in war fighting and to integrate into a US Battle Group. And so, we were looking at warfare on a much greater scale. And I think that influenced us tremendously in the way we operated as individuals."[155] Chalmers' remarks go to the experiential advantage gained by those in DDGs through their ability to operate as a constituent element in a carrier Battle Group of the world's most powerful Navy. This was an experience particularly to be valued given the relatively small size of the RAN. Sending a single vessel or few ships into an area of operations was almost certainly inadequate in developing a coherent naval combatant force. Chalmers continues "… you started looking at the Battle Group as the unit of power rather than the ship."[156] Chalmers concludes that the RAN gained a more comprehensive understanding of maritime warfare through its operation of the DDGs.[157]

Naval power in this era was marked by a trend towards greater integration of the sensors and weapons of individual units into a consolidated naval force. It was led by the USN and served to increase markedly the importance of being skilled in naval operational command and control.[158] The shift was facilitated by connecting high capacity satellite communications systems to relatively low cost but powerful digital computing capabilities, and the distribution of globally gathered intelligence and other information became possible in near-real-time.[159] Theories of combining disparate sensors and weapons on different platforms through multiple communications networks gradually became practicable, and not being part of a network denied the commander an awareness of and ability to participate in the battle. Being much more aware of the environment and situation, however, added an increased degree of complexity in managing information, as well as requiring greater technical expertise in

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154 Interview with Vice Admiral Donald Chalmers, 8 February 2013. Page 2

155 ibid

156 ibid page 11

157 ibid

158 The evolution of information and communications technologies supporting naval command and control methods has transformed how many aspects of naval warfare are conducted. For an early examination of this topic see: Vinny DiGirolamo, *Naval Command and Control: Policy, Programs, People & Issues* Fairfax, Va: AFCEA International Press, 1991

159 Near-real-time means a short delay was incurred through the processing of information in an external location before being communicated to others. Through usually being computer generated however, it enabled significant decreases in the time previously taken by manual methods.

controlling and maintaining the new technologies.[160] Commanders and crews of DDGs were exposed to these contexts through their operational interaction with the USN and these ideas were imported into the wider RAN, and eventually more broadly into the Defence environment.[161] The individuals who acquired that early knowledge of modern naval command and control methods did so in the DDGs, and became the practitioners who had the task of integrating it into how the RAN operated.

Underway Replenishment – Increased Operational Endurance

The DDGs were designed to exploit the modern USN techniques for underway replenishment (UNREP)[162] developed and refined during WWII, particularly in the Pacific Theatre.[163] The RN was not prepared for its WWII logistical experience in the Pacific and its lack of fuel capacity occasionally prevented it continuing operations at the same intensity as the USN.[164] In contrast with its RN-origin ships, by virtue of their equipment and fittings the RAN's DDGs were able to take full advantage of USN UNREP capabilities. At the time of the Vietnam War, the UNREP capability of the USN was exemplified by its Sacramento class ships, designed to be 'one-stop-shops' capable of transferring large volumes of materiel, with their underway speed enabling them to keep up with carrier operations.[165] The ships could simultaneously transfer fuel, stores and ammunition as well as conducting helicopter transfers – known as a VERTREP.[166] The USN 7th Fleet, to which the DDGs were assigned, made much use of the VERTREP method and as a consequence were able to maintain a high level of support to ships

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160 For a comprehensive and updated examination of these capabilities see: Norman Friedman, *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars* Annapolis, Md.: Naval Institute Press, 2009

161 CNS Hudson opined that naval operations were amongst the most difficult for non-navy personnel to comprehend, and particularly so in the Department of Defence. See: Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1),* Canberra: Sea Power Centre Australia. Page 4

162 The equivalent RN term is Replenishment at Sea (RAS).

163 Thomas M. Kane, *Military Logistics and Strategic Performance* Portland, OR: F. Cass, 2001, Chapter 3

164 Ross Rustici and D. Yung Christopher, *China's Out of Area Naval Operations: Case Studies, Trajectories, Obstacles and Potential Solutions*, China Strategic Perspectives ed., Vol. 3 (Washington DC: Institute for National Strategic Studies National Defense University), 2010, pages 24-25

165 Peter V. Nash, *The Development of Mobile Logistic Support in Anglo-American Naval Policy, 1900-1953* Gainesville: Gainesville : University Press of Florida, 2009. Page 75. The ship type nomenclature was AOE.

166 VERTREP – abbreviation for vertical replenishment – the transfer of stores from a helicopter hovering over a ship – typically carried in an underslung cargo net.

on operations.[167] Replenishment of ships on naval gunfire support operations took place frequently, and the RAN operators of the DDGs found the USN ammunition replenishment method, whereby the delivering ship controlled the transferring highline using powered assistance, known as the modified Burton Housefall rig,[168] to be far superior to the all-manual methods then used by ships of RN-origin for jackstay transfers.[169] In contrast, the RN-origin Daring class destroyer HMAS *Vendetta,* which conducted the only non-DDG Vietnam deployment, was unable to receive fuel at the normal pumping rate of USN supply ships and had to modify its refuelling methods.[170]

Captain David Leach commanded *Perth* during its second Vietnam deployment and notes just how effective the USN was at keeping warships supplied while they were still conducting operations, which was important in ensuring their extended presence to exert pressure on an enemy. Leach remarks that *Perth* was replenished with "…ammunition, fuel and perishable food approximately every three days, major food and dry provisions every three weeks and critical spares by air drop when required…Our longest (time at sea) was 35 days, so it became a matter of crew fatigue rather than ship problems. *Perth* had 71 underway replenishments…"[171] Captain Guy Griffiths remarks that not only did *Hobart* have to reorganise its procedures and routines to adapt to the demands of Vietnam operations, but its UNREP organisation also had to be redesigned to operate multiple positions so it could simultaneously receive fuel, ammunition and stores, and conduct a VERTREP while alongside the supplying ship.[172]

The knowledge gained about UNREP and VERTREP and related operational logistical expertise acquired by DDG personnel during Vietnam operations were transferred into the wider RAN through such activities as work up training for subsequent deployments, such as that

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167 Peter V. Nash, *The Development of Mobile Logistic Support in Anglo-American Naval Policy, 1900-1953* Gainesville: Gainesville : University Press of Florida, page 223

168 United States Navy, *Underway Replenishment - NWP 4-01.4* Washington DC: United States Navy Doctrine Command, 1996. Chapter 7.

169 The all-manual aspect refers to all of the lifting and work using the various ropes being done by hand.

170 John Perryman and Brett Mitchell, *Australia's Navy in Vietnam - Royal Australian Navy Operations 1965-72*, page 24

171 D. W. Leach, "DDGs in Vietnam: HMAS Perth 19 September 1968 to 19 April 1969," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 338-342, page 340

172 G. Griffiths, *DDGs in Vietnam: HMAS Hobart 7 March to 27 September 1967*, page 332

conducted by *Perth* for its second term of Vietnam duty.[173] Prior to that time the RAN had relied upon RN methods but, although comparable, they were not of the same standards as those the USN had developed in overcoming the logistical constraints on operations in the vast WWII Pacific theatre.[174]

Accommodation and Crew Fatigue

As remarked by Leach,[175] minimising crew fatigue is important in maintaining operational proficiency, and the standard of accommodation in warships influences how rested their crew can become when off duty. Space provided for recreation while preparing for further operational commitments is also a valuable asset. To those who spent considerable periods at sea the question of such comforts was a real concern. RN-origin ships were not well designed for tropical climates and the living conditions for RAN sailors immediately post-WWII were generally unsatisfactory. In 1956, the Commanding Officer of HMAS *Tobruk*[176] observed "…in a prolonged period in tropical climates, (living) conditions become well nigh unbearable."[177] In October 1960, as part of a wide ranging censure of the RAN and of the uncritical adoption of RN practices by the Naval Board, Mr Beazley told Parliament that HMAS *Arunta* had a regulation that "Petty officers will shower once a week as an example to the men."[178] He went on to remark that "Australian men in the tropics do not need such an example. They want at least two showers a day but because RN ships are not designed to produce enough fresh water cannot get them."[179]

By contrast with RN standards, the historian Malcolm Muir notes that the DDGs having "Air conditioning in all living and operations spaces plus modern bunks and furniture made for a "quantum jump" in habitability over WWII destroyers."[180] Griffiths agrees and, by way of comparison with the accommodation in RN-origin ships which comprised all of his previous

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173 "HMAS Perth's Shop Window," *Royal Australian Navy News,* 30 August 1968, Vol11 No18, Page 8

174 Thomas M. Kane, *Military Logistics and Strategic Performance*, Chapter 3

175 D. W. Leach, "DDGs in Vietnam: HMAS Perth 19 September 1968 to 19 April 1969," page 340

176 *Tobruk* was a Battle class destroyer of British design origin. Alastair Cooper. "1945-1954: The Korean War Era." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001. 155-179. Page 166

177 Jeffrey Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972* St. Leonards, N.S.W: Allen & Unwin in association with the Australian War Memorial, 1998. Page 30

178 Commonwealth of Australia. *CPD [Reps] Vol 41, 11 October 1960.* Page 1858

179 ibid

180 Malcolm Muir, *Black Shoes and Blue Water: Surface Warfare in the United States Navy, 1945-1975* Washington, D.C: Naval Historical Center, Dept. of the Navy, 1996. Page 123

experience, notes that the standard of accommodation and living amenity of the USN ships were better than in any he had served in, and he recalls the "… hotel systems in the ship which were something I'd never experienced before…"[181]

During construction, the RAN modified slightly the USN standard DDG accommodation configuration to meet its own requirements. In 1964 Commander Maxwell Reed was the resident RAN liaison officer in Bay City, Michigan, oversighting construction of the RAN's DDGs. He notes that unlike in the USN, Petty Officers in the RAN had separate messing and accommodation arrangements, and changes had to be made to the main cafeteria layout in order to meet RAN standards.[182] He also observes that the USN did not have doors fitted to the heads[183] of their ships, but that the RAN wanted them fitted during building. He remarks on this seemingly trivial requirement "… which of course the US Navy didn't have and there was a great lot of hilarity of the foreman of the boiler shop sitting down and sitting on the loo and have a mock-up door swinging in front…That was done without any change to the price as far as I can remember."[184] While the RAN could accept some constraints on habitability, a lack of privacy in that situation was not one of them.

The wardroom of a DDG was configured by the USN to be a surgical operating and medical treatment space when required, but the RAN also introduced elements of its RN heritage with the insistence that, unlike for their USN counterparts, a DDG would be fitted with a bar to serve alcoholic beverages. Sub Lieutenant David Cotsell served in *Hobart* as a junior officer during its second Vietnam deployment. He notes that during construction one officer's cabin was sacrificed so that a bar could be installed in the DDG wardroom, and that there were other physical changes so that the Commanding Officer could have his own eating arrangements since, unlike in the USN, in the RAN the Commanding Officer was not a member of the wardroom.[185]

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181 Interview with Rear Admiral Guy Griffiths. Page 2. 'Hotel services' refers generally to those features which support daily life in a ship and includes: galleys, heads and bathrooms, fresh water making capabilities, ventilation and air conditioning.

182 Interview with Rear Admiral Maxwell Reed, 8 February 2012. Page 5

183 A 'head' is an old naval term still used to signify a ship's compartment designated as a toilet which typically contains both urinals and pedestal toilets. See: Peter Kemp and Ian Dear, *The Oxford Companion to Ships and the Sea*, 2nd ed. Oxford ; New York: Oxford ; New York : Oxford University Press, 2005

184 Interview with Rear Admiral Maxwell Reed. Page 15

185 Interview with Captain David Cotsell pages 48-49

Life in the DDGs was not optimal however. Rear Admiral David Campbell had a wide ranging career that traversed various naval professional disciplines. He reflects on how the ships were different from any others he had served in but comments on the accommodation as being less than luxurious. Yet he feels that it was of little consequence to the crew. Campbell's remarks in the epigraph to this chapter[186] give a sense that those who operated the ships were tolerant of the less than ideal living conditions because they were otherwise modern and capable and, most importantly, could fight. Relaxation for officers was also a consideration in ensuring that their accommodation was as comfortable as possible, but as Menhinick notes, newer RN ships such as the Type 22 and Type 42 classes of destroyers were relatively luxurious compared with the DDGs.[187] Captain David Cotsell makes the same observation about accommodation in the last two of the RAN River class, *Swan* and *Torrens,* being so much more comfortable and generally better than the DDGs.[188]

The progressive introduction of equality of career opportunities as between male and female members of the RAN reached a milestone in June 1985 with the disbandment of the Women's Royal Australian Naval Service (WRANS) as a separate service.[189] From September 1984 all females who joined the Navy were liable for sea service.[190] By May 1991 however, as part of finalising the major refit of *Hobart*, its Commanding Officer raised the issue of lack of any formal accommodation management plan for female sailors in DDGs.[191] Vice Admiral Ritchie argues that the opportunity for the DDGs to be used more effectively in the training and for the service of women at sea was missed. He remarks "…I think there are some negatives about DDGs in terms of influence on the Navy…you might say that it slowed down the introduction of women serving at sea because you couldn't put them in DDGs practically…we could have had more there at sea and that indeed would have been a good thing."[192] Ritchie is referring to the practical requirement to segregate sleeping and accommodation spaces, bathrooms and toilets of the ships to permit privacy in a mixed gender environment. The ships

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186 Personal Communication from Rear Admiral David Campbell, 28 June, page 1
187 Interview with Commodore Richard Menhinick page 14
188 Interview with Captain David Cotsell page 48
189 "WRANS Window Appeal," *Royal Australian Navy News,* 15 November 1985, Vol28 No21, Page 12
190 "Women Seabound," *Royal Australian Navy News,* 7 September 1984, Vol27 No17, Page 3
191 Royal Australian Navy, *RAN DDG Modernisation Project - ECP 141 Senior/Junior Sailors Mixed Gender Accommodation - HMAS HOBART. HMAS HOBART Letter Dated 15 May 1991. (SPC.DS.60),* Navy File 91-12103 Part 1 Canberra: Sea Power Centre Australia. Page 3
192 Interview with Vice Admiral Christopher Ritchie. Page 68.

had been designed to meet all-male requirements and more modifications would have been necessary to achieve a satisfactory configuration.

The DDGs represented a significant advance in habitability when first acquired, albeit requiring adaptation for RAN needs. But by the time of their departure commencing in 1999, the DDG standard of accommodation was well below that of the RAN's FFGs and Anzac frigates. By modern standards they were austere and incapable of meeting contemporary societal requirements for mixed gender accommodation.

Impact on RAN Technical Matters

The technical proficiency of a Navy contributes substantially to its fighting capability,[193] hence it needs a level of technical expertise to assess whether its equipment is fit for purpose, can be maintained, and can perform as intended. The advanced mechanical and electronic systems of the DDGs were new to the RAN, as was their design, and they represented its most technically advanced equipment. Here we will examine how naval personnel applied their technical expertise to ensure the DDGs met the RAN's operational performance standards, and considers their assessment of how these challenges were addressed.

Technical Proficiency

The steam propulsion system of the DDGs was much more technically advanced than those of RN-origin ships already in service with the RAN, and it might have been expected to be difficult for members of the RAN to operate and maintain. This proved not to be the case and the marine engineers were enthusiastic about what they found. Rear Admiral Maxwell Reed believes the propulsion unit to be a complete generation ahead of the RN Daring class and notes that it was a most attractive one: "It was miles ahead of anything we'd experienced…it was a very impressive steam system… 35 knots…70,000 horsepower…"[194] Reed also notes that "…one thing that the DDGs did which was never …done with any of our (RN-origin) ships was full ahead full astern manoeuvre on trials …it was all automatic, it all turned over beautifully."[195] As an example, Lieutenant Robert Hall was the officer of the watch when

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193 The technical proficiency of the Navy is taken to collectively include its engineering and technical body of knowledge and qualified people. The Navy educated and trained its technical officers and sailors to meet their responsibilities. RAN Mechanical and Weapons Electrical Engineering Officers were normally educated to undergraduate level, but some went further, followed by training to equip them for their career paths and expected responsibilities.

194 Interview with Rear Admiral Maxwell Reed. Page 7

195 ibid

Brisbane visited San Francisco on its return voyage to Australia.[196] There was a strong current running at the wharf to which the ship had been assigned, which introduced manoeuvring difficulties for berthing. He recounts that the Commanding Officer ordered the ship's engines full-ahead and then full-astern in very short order. The consequence was a near perfect berthing that highly impressed the watching USN admiral who had expected *Brisbane* to hit the wharf very hard.[197]

The first Marine Engineering Officer (MEO) of *Perth* was Commander Alec Townsend, a former RN officer who had transferred to the RAN.[198] Commodore Cooper remarks that Townsend said he had seen earlier versions of the DDG machinery and its layout in the four funnel American destroyers provided to the RN under lend-lease in WWII,[199] the implication being that the USN had been ahead of the RN in aspects of steam propulsion technology for some time. Until the arrival of the DDGs, all steam propulsion systems of the RAN were of RN-origin.

In any warship it is the sailors who do the bulk of the hard practical and physical work needed to keep it functioning. Commander Robert Mummery had been the MEO of *Perth* and remarks that he relied heavily on his sailors to be able to manufacture replacement parts and repair its machinery at sea. Their skills enabled the ships to be at sea for longer than they might have been otherwise. He comments "If it hadn't been for the Chief TIFFs come in handy store down at the tiller flat (we) probably wouldn't (have) stayed at sea as well as we did…we manufactured…valve spindles, and repaired valve seats etc."[200] Mummery highlights how the repair of pipes, sometimes requiring their full re-manufacture, was a demanding requirement when steam pipes utilised pressures of 1,275psi[201] and hydraulic pipes 4,000psi.[202] A 'come in handy' store, as distinct from a Ready Use Store or Locker, was naval jargon for a place in the

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196 Interview with Commander Robert Hall, page 30

197 The DDGs were capable of stopping in four ships' lengths after being at full ahead power when full astern power was applied. Each ship conducted such a trial as part of its acceptance program. See: United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 280 Folder DDG2 (Vol1 (1 of 2) Chief, Bureau of Ships USS CHARLES F. *ADAMS* (DDG-2) Preliminary Acceptance Trials and Material Inspection Ser 523A-3658 dated 13 October 1960. Page VI-4

198 Townsend's seniority as a Commander was 31 December 1960. See: *Navy List* March 1965 page 22, which made him the most senior serving officer in *Perth* after the Commanding Officer.

199 Interview with Commodore Ormsby Cooper. Page 14

200 Interview with Commander Robert Mummery, 4 July 2012. Page 20. A Chief TIFF is a Chief Petty Officer Engine Room Artificer – a senior highly qualified tradesman.

201 psi – abbreviation for pounds per square inch

202 Interview with Commander Robert Mummery, page 20

ship containing items of importance that were not necessarily part of the ship's authorised spare parts holdings. Its contents were generally chosen on the experience of senior technical sailors who did not trust the naval stores managers always to provide critical materiel in a timely manner. But adoption of such a system by the MEO's Department had the negative impact of preventing the Supply Department from being able to calculate their usage rate more accurately, thereby inhibiting their appreciation that a change to the stock holding allowance or management of the repair cycle was needed.

Lieutenant Commander David Holthouse[203] was the MEO of *Hobart* during its second deployment to Vietnam. He corroborates Mummery's remarks and recounts how his sailors had to manufacture parts and fittings to repair damage caused by being hit by missiles fired from a friendly US aircraft.[204] Holthouse also recalls the skills of his sailors in manufacturing a complicated threaded spindle from a block of steel, working from onboard drawings to repair a main engine ahead-throttle, for which he gave them high praise.[205] The RAN philosophy of training its technical officers and sailors to be able to make or fix virtually anything contributed to its obtaining such very good service from the DDGs.

Further differences in RN and USN approaches to technical training are highlighted by Commander Antony Anderson who was the WEEO of *Perth*. He considers that RAN technical officers and sailors had been more highly trained than their USN counterparts, and notes there was occasional banter between RAN sailors as to how structured and limiting the USN approach to maintenance was.[206] The RN system adopted by the RAN of comprehensively training people and then expecting them to analyse and solve problems through the application of technical principles and practices was different from that of the USN, where training was generally less comprehensive as Anderson saw it. Placed in context, Anderson recognises the lesser importance of the DDGs to the USN than to the RAN and notes "…they

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203 Later a Rear Admiral.

204 Royal Australian Navy, *Reports of Proceedings HMAS HOBART. Dated June 1968. (SPC.DS.53.1),* Canberra: Sea Power Centre Australia.

205 David Holthouse, "Reflections on Four Decades in the Profession of Naval Engineering - and Jacky Fisher Got it Right!" *Headmark (Journal of the Australian Naval Institute),* 151, 2014, 42-47, page 45

206 Interview with Commander Antony Anderson, 24 August 2012. Page 17

weren't their top ships (but) they (USN technical officers and sailors) were on the way up to the top ships, but they were our top ships. So we should have operated them better."[207]

Technical Professional Expertise

Burrell's confidence in his men being able to operate and maintain the ships successfully was proven to be well founded. But his focus was on having proficiency in ships of the fleet, and not the higher level of technical professional expertise needed by a Navy proper. Rear Admiral Trevor Ruting was a naval architect and had been MEO of *Perth*, and at one time the Director for the Anzac frigate project. He is sceptical of the higher level of engineering understanding actually possessed by the RAN when it committed to acquisition of the DDGs, and considers that the engineering challenge had been underestimated. Instead, the RAN's leadership might have been overconfident. He points to the underpinning of specialist engineering knowledge needed by a Navy to understand something like the DDG design, as opposed to simply being able to maintain the equipment, which was more of an operational matter. Ruting remarks "I'm a little suspicious of the fact that in the late 60s when we bought our DDGs that we felt that we were sufficiently well rounded naval officers that we could do it."[208] Ruting notes that the RAN was as good as the USN in operating the ships,[209] but he echoes Goldrick's view in terms of the professional demands of being self-reliant as a Navy which requires broader national capabilities for its creation and sustainment.[210] Ruting elaborates on how the DDGs embodied a depth of advanced American engineering knowledge and practice, drawn from an American national populace, which allowed it to design, maintain and sustain such modern and capable ships, but those attributes were not possessed to the same degree by Australia when the ships were acquired.[211] Ruting's experience had made him aware of differing engineering design philosophies as between the RN and USN, which the RN had indeed acknowledged many years previously,[212] and he notes that it was necessary for the RAN to understand what those differences were so as to properly comprehend its own

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207 ibid

208 Interview with Rear Admiral Trevor Ruting, 7 March 2012. Page 41

209 ibid

210 James Goldrick, *A Fleet Not a Navy; some Thoughts on the Themes*, pages 293-295

211 Interview with Rear Admiral Trevor Ruting. Page 41

212 In 1891 the RN had recognised that USN battleships "…were wholly American in conception and execution…" and Hagan remarks that the USN had by then become independent of European naval designers. See: Kenneth J. Hagan, *This People's Navy : The Making of American Sea Power* (New York : Toronto: New York : Free Press, 1991) page 197

circumstances.[213] Ruting's remarks are consistent with those of David Holthouse, who recounts how the USN simplified a difficult and complex task by designing the thrust bearings in its steam turbines such that they were far more straightforward to replace than their RN counterparts.[214]

Expertise takes time to accumulate through directed professional development as well as the experience and knowledge gained by an organisation over time. Before the RAN acquired the DDGs, its RN-origin circumstances made it expedient to utilise the engineering infrastructure and associated training of the RN and not fully duplicate such capability for the RAN in Australia. The benefit being that while both technical and non-technical personnel could receive some training in Australia, deeper technical training was available in the UK. Knowledge was also gained by the large number of RAN officers who underwent exchange service with the RN and served in ships with equipment similar to those of the RAN (but not the DDGs), and technical knowledge was introduced into the RAN through the large number of RN officers on exchange in Australia.[215]

Ruting remarks that the major lesson he learned from his DDG experiences was that if the RAN were to become fully competent in engineering matters, then it really needed to understand comprehensively the engineering design philosophy of the ship. In practice this meant knowing how the design of the ship had affected the methods adopted for its construction. That same understanding should also flow into RAN technical training and operational practice as well as the technical oversight and inspection arrangements necessary to ensure the complete integrity of the ship.[216] Ruting is really drawing attention to the national capabilities needed by Australia to assist in building the self-reliance of the RAN to a comparable level to that enjoyed by the USN and the RN. He comments that he was impressed with the capabilities of the USN Naval Sea Systems Command (NAVSEA) and what he calls its "engineering infrastructure". By contrast, he reflects that the leadership of the RAN had not fully understood what was necessary for it to be in control of its own engineering destiny. He notes that when faced with major organisational change, the senior leaders of the RAN were

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213 Interview with Rear Admiral Trevor Ruting. Page 34

214 David Holthouse, *Reflections on Four Decades in the Profession of Naval Engineering - and Jacky Fisher Got it Right!*, page 45

215 Alastair Cooper, "At the Crossroads: Anglo-Australian Naval Relations, 1945-1971," *The Journal of Military History,* Vol 58, 4, 1994, 699-718

216 Interview with Rear Admiral Trevor Ruting, page 38

"… (un)able to adequately enunciate the impact of taking away, peeling away all of those level of oversights, support etc and we didn't understand what being a parent Navy was."[217] That is to say, the leadership did not fully grasp the implications of Australia, and the RAN, not having the traditional underpinning of British and RN technical expertise it had previously enjoyed for a new class of ships.

The USN was the parent Navy for the DDGs, and until the USN withdrew its own ships, the RAN was able to some extent to draw upon that expertise to support its own DDGs. When the RAN later acquired classes of ships uniquely designed or adapted for its own purposes, such as the Anzac frigates, it also became a parent Navy with a need for competence and knowledge which it had to acquire for itself. Ruting again echoes Goldrick's distinction between a Fleet and a Navy,[218] Ruting's view being that in making the transition from the RN to the USN, the RAN had been shielded from learning that "…you do need very significant depth to be able to support yourself and it does come at a cost, but that cost is an essential part of having the operational capability..."[219] Ruting's remarks are also consistent with those made in 1960 by Commander Poole, an RN officer on exchange service at the time of the RAN's consideration of the Adams class. He advised his superiors that "…the introduction of U.S. Weapons on a large scale into the R.A.N. will present problems of maintenance, training and logistics of considerable magnitude and cost out of proportion with the fire power and operational value of the ships…"[220] Both officers understood that the true cost of owning a warship is considerably greater than its purchase price, and that cost extends beyond the platform and systems of the ship for both the Navy and the nation.

Vice Admiral Walls similarly notes the cumulative effect of a large number of wide ranging organisational reviews conducted by the Department of Defence between 1972 and 1997, which he had either been affected by, or associated with in some way. Their primary purpose was to achieve efficiencies, but he considers that their implementation had a particularly deleterious impact on naval technical expertise. He echoes Ruting in noting that the naval technical capability acquired over more than two decades of operating the DDGs and needed

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217 ibid page 39

218 James Goldrick, *A Fleet Not a Navy; some Thoughts on the Themes*, page 295

219 Interview with Rear Admiral Trevor Ruting, page 40

220 Royal Australian Navy, *Minute RAN Director of Weapons to CNTS: Implications of the Acquisition of the US DDGs of the Charles F. Adams Class for the RAN. Dated 20 December 1960. (SPC.DS.13),* Navy File 211/207/3 Canberra: Sea Power Centre Australia.

to support the ships had not been fully appreciated by either the leadership of the RAN or the Department of Defence. As a consequence, when changes were introduced, the wider technical capability of the Navy had suffered.[221] In his view, the extent of change in the Defence organisation in technical matters became such that "…decision making under uncertainty became lousy decision making to begin with let alone the uncertainties that the future might bring..."[222] In other words, the desire for Defence organisational efficiency had introduced shorter term risks in addition to those inherently present in making long term policy and capability choices for the RAN, both of which incorporated significant technical issues. Important aspects of the learning which had flowed from having to be more technically self-reliant to support the DDGs were therefore lost. It is difficult to be sure whether it was the leadership of the RAN that could not make its case for retention of the RAN's technical expertise or, regardless of its advice, changes were imposed so as to meet other administrative imperatives, the outcome of which later brought serious operational consequences for the RAN.

As noted by Walls, by 1997 there was still a failure by RAN and Defence senior leaders to recognise fully the important linkage between the RAN's technical capabilities and those of Australia's broader industrial infrastructure. Collectively these capabilities underpinned the ability of the Navy to be fully professionally competent, which was necessary to be an effective parent Navy. Such understanding may have been handicapped by the continuing ability of the RAN to draw upon support from its RN counterpart for the detailed needs of its diminishing number of RN-origin vessels, as well as on the USN in a lesser fashion for DDGs and FFGs. Nonetheless, this represented an organisational failure in terms of a lack of comprehension of the capabilities needed to be operationally effective on a continuing basis. Operation of the DDGs had in fact contributed to the growth of knowledge and provided insights as to what was needed for the RAN to become fully technically competent, but in an environment in which priorities were assigned with the aim of achieving efficiencies, that learning was not widely enough shared so as to shape the decisions taken.

Ruting's and Walls' opinions, though based on their experiences some years before, are consistent with the findings of a 2011 report by Mr Paul Rizzo consequent upon the unplanned

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221 Interview with Vice Admiral Robert Walls, page 26

222 ibid

early decommissioning of the Landing Platform Amphibious (LPA) ship HMAS *Manoora*, the extended unavailability of its sister ship HMAS *Kanimbla,* and the temporary unavailability of the Landing Ship Heavy (LSH) HMAS *Tobruk*.[223] A lack of naval engineering competence was a key contributor to the outcome. Rizzo identified the causal factors behind the dilution of RAN technical expertise as being a failure by the RAN and Defence to develop, properly resource and implement a technical regime for the ships and their operational support.[224] That dilution was contributed to by the loss, in the intervening period, of an important lesson available from the DDG experience in terms of the Navy needing such a national technical capability. Such expertise had previously been resident in government-owned naval dockyards managed by the RAN. But their privatisation[225] introduced commercial considerations which diverged from the needs of the Navy. Such private ownership of the dockyards contributed to naval engineering requirements being more narrowly defined in terms of the capability to operate the ships. Whereas what was also needed and what the leadership of the Navy needed to ensure, was a broader engineering expertise capable of preventing the systemic technical problem reported by Rizzo.[226] At multiple points his report emphasised the importance of Australia's maritime industry to the Navy and gave strong encouragement to forge this as a much closer relationship. The interdependence that would result could be expected to increase the symbiotic capability of national industry and the Navy. In that sense, the broader engineering expertise needed to underpin the ongoing support of the DDGs and beginning to form before large scale efficiency reviews were implemented had been unrecognised important catalysts to adoption of the outcomes as much later advocated by Rizzo.

The electronic capabilities of the DDGs were much more technically advanced than those in other ships of the RAN. Commander Peter Purcell had been the WEEO of *Hobart* and previously intimately involved in the NCDS combat systems upgrade program. Subsequently, as a Rear Admiral, he had responsibilities for the acquisition and support of all Navy platforms and systems. Purcell considers that acquisition of the DDGs was very significant for the RAN

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223 P. Rizzo, *Plan to Reform Support Ship Repair and Management Practices* Canberra: Department of Defence, 2011.

224 ibid. Annex B.

225 David Stevens, ed., *The Australian Centenary History of Defence: The Royal Australian Navy*, Vol. III Melbourne: Oxford University Press, 2001, pages 245-246

226 P. Rizzo, *Plan to Reform Support Ship Repair and Management Practices* Canberra: Department of Defence, 2011. Foreword (page 5)

and remarks "…I believe that it brought it into the 20th century…"[227] Prior to the DDGs the RAN had been dealing with fairly basic analogue systems in the weapons areas, but when the DDGs were acquired, the RAN "…moved into reasonably sophisticated analogue systems but more importantly we moved into guided weapons which were a little bit more than just a local area defence weapon, so all of those new concepts started to move the RAN I think in a particularly constructive direction."[228]

Adoption of American systems and methods introduced opportunities for Purcell to compare them with others to which the RAN had been accustomed. He notes differences between the RN and the USN style to which the RAN had to adapt and comments that the RN "…tended …to over-engineer. And over-engineering means that you build in a hell of a lot of either maintenance requirements or problems."[229] Whereas, he continues: "The Americans realised that they were not sending a bunch of scientists or physicists to sea with these systems, they were sending sailors who had not necessarily had engineering training before they went off, and did a course and they were really designed to be able to drive automatic diagnostic programs."[230] This is further to the point that the USN was able to obtain acceptable levels of operational expertise for itself through lower levels of technical training because it invested more effort in the design and associated maintenance regime of its ships than did the RN. As previously remarked by Anderson, the technical expertise which the RAN had been able to gain through adoption of RN technical training standards for its officers and sailors had contributed to the high level of operational exploitation it achieved with its DDGs.

The Australian Defence Review of 1963 had approved fitting the DDGs with the Australian developed Ikara anti-submarine weapon system in lieu of the ASROC fitted to the USN DDGs.[231] Purcell had been associated with installation of Ikara in the DDGs, not all of which went smoothly. He notes there was a problem keeping missiles firmly in place on their holding rails and highlights how "They (Ikara missiles) were shaking off the rails. The vibration characteristics of the compartment were incompatible with the way the rails and the holding

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227 Interview with Rear Admiral Peter Purcell. Page 16
228 ibid
229 ibid page 47
230 ibid
231 Commonwealth of Australia, *Department of Navy Three Year Program - 1965/66 to 1967/68*, Vol. NAA: A1945, 84/3/10 (Canberra: National Archives of Australia) Page 3 to Appendix 1 to Naval Three Year Program 1965/66 – 1967/68 dated 2 October 1964 (Decision 768)

arrangements had been structured. It wasn't every missile. All you needed was one or two drops to get yourself worried."[232] The Tartar missile magazine was constructed of steel, but the Ikara magazine, located above the waterline between the two funnels of the ship was constructed from aluminium. Cooper remarks that when *Perth* initially arrived in Subic Bay on its first deployment to Vietnam it berthed alongside "…two destroyers that basically had their upper deck wiped out."[233] The implication for combat damage to the Ikara magazine was obvious, and after advice by the USN, *Perth's* Commanding Officer decided to offload all the Ikara missiles as a safety precaution. [234] *Hobart's* second deployment followed that of *Perth* and it adopted the same procedure of landing its Ikara missiles.[235] On that deployment *Hobart* was hit by friendly fire and fragments of a USAF Sparrow missile penetrated the Ikara magazine, the consequence of which could have been disastrous if the missiles had been onboard. [236]

The significance of this episode is that the necessity of protecting a guided missile magazine from such penetration should have been appreciated by the RAN, and it may well have been, but it was the crews of the ships which had to address this issue.[237] As we have seen, the Adams class was designed with a weight growth limit of 19 tons,[238] but by carrying more Ikara missiles and in a larger magazine than its USN ASROC counterpart system, it introduced greater weight for the RAN's DDGs in the same high location above the waterline. To ensure

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232 Interview with Rear Admiral Peter Purcell. Page 11

233 Interview with Commodore Ormsby Cooper. Page 26

234 Ibid. *Perth's* Report of Proceedings shows that the USN had suggested that the Ikara magazine was vulnerable and the missiles were duly stored in Subic Bay until the deployment ended. See: Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1965 to December 1967,* AWM78-292-5 Canberra: Australian War Memorial. Page 347

235 *Hobart* was not fitted with Ikara on its first deployment.

236 Royal Australian Navy, *Reports of Proceedings HMAS HOBART. Dated June 1968. (SPC.DS.53.1)*, 1-27). Paragraph 39

237 When the USN offered design options to accommodate helicopters and Ikara, it included an option to incorporate the Ikara missile magazine in a 16 foot space between machinery compartments. This would have placed the magazine below the ship's waterline with missiles taken up by a lift to the deck mounted launcher. See: United States Navy, *Records of the Bureau of Ships* Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: DDG-2 Class, Progress Report on Feasibility of Modifications Ser 440-080 dated 15 May 1961. Figure 1. (See diagrams in Appendix C)

238 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: Sonar improvements in combatant ships Ser 452-0110 dated 20 April 1961 (this refers to the weight growth potential of the DDG-2 class)

ship stability measurements were within tolerance, the RAN appears to have made compromises in the protection of the Ikara magazine, in which was stored guided weapons fitted with rocket motors and torpedoes carrying high explosive warheads. Had the RAN been able to influence the DDG design as it was being developed by the USN, this problem may have been avoided, but designing the Ikara magazine separately eliminated that possibility.[239] Had the Vietnam conflict involved a submarine threat, the ships would necessarily have incurred greater risk through keeping their Ikara missiles onboard.[240]

Other officers were impressed with the advanced technical characteristics of the DDGs and proud that the RAN could successfully operate and maintain ships of such sophistication. Lieutenant Ian Holmes was a commissioning crew member of *Hobart* as a WEEO and he considers the RN capabilities to have been a generation behind those of the USN. During his subsequent exchange service with the RN he "…nearly bit the end off his tongue…" when an RN admiral said to him: "…why did you buy USN crap?" [241] To which Holmes replied "Sir, the Royal Australian Navy bought ships starting in the machinery spaces, with steam pressures double anything you have in service, the digitally commanded three dimensional surface radar with missile systems with performance that you don't even dream of in any of your systems and with gun mountings whose reliability is unexcelled…we done good."[242] Holmes had undergone his training as a weapon systems maintenance officer in the UK and served in the RAN Daring class destroyer HMAS *Voyager;* he was accordingly very familiar with both RN and USN capabilities and capable of making direct comparisons.

The engineering practitioners had to use their expertise in delivering the operational capability of the DDGs and they found the ships to be more technically advanced than any other ship in the RAN. Those who dealt with the mechanical aspects were less challenged than those dealing with electronic capabilities, but collectively their education and prior training were adequate and they were professionally rewarded by their experience. Those in the DDGs felt themselves to be technical equals with the RN and USN. In contrast, technical appreciation was not present at the highest levels of the RAN and Department of Defence, which were not

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239 The Ikara magazine compartment was fitted to the ships when being constructed, but the internal missile handling equipment and launchers were installed on return to Australia.

240 Ikara was retained onboard *Brisbane* for its first Gulf War deployment. Interview with Vice Admiral Christopher Ritchie, 30 January 2013. Page 51.

241 Interview with Commodore Ian Holmes, 3 October 2011. Page 35

242 ibid

fully cognisant of the risks introduced by organisational changes focussed on efficiencies. Those changes contributed to diluting the broader RAN technical expertise needed at the Navy-wide level, which ultimately had serious operational consequences for the Fleet. The need for technical self-reliance had not been fully comprehended by those in the senior positions of Defence when making choices affecting the future of the Navy.

Acquisition of the DDGs had brought with them the unexpected need for the RAN and Australia to start to develop a more sophisticated understanding of what being a 'Navy' meant. To continue to successfully operate and support the DDGs, both the Navy and the nation ultimately had to rely upon themselves far more extensively than they had envisaged at the outset. Goldrick considers that the difficulties of being a 'parent navy' became more obvious to the RAN from the 1980s onwards,[243] but the seeds of that appreciation were first sown with the arrival of the DDGs in the mid-1960s.

Impact on RAN Logistical Support Matters

Prior to introduction of the DDGs, the RAN had adopted RN practices and methods for supply and support. At that time, responsibility for the management of naval stores was held by non-seagoing civilian members of the RAN, and accordingly they had only a general understanding of naval operations. Naval stores at sea were managed by Supply Officers, but the real expertise rested with sailors.[244] An enduring impact on the RAN of the DDG experience in Vietnam was the demonstration that professionally managed logistical support ranked alongside operational and technical prowess in terms of importance for fighting ships. The RAN's use of established of RN methods proved to be inadequate for modern naval operations.

Introduction of the DDGs to the RAN was inadequately managed from a logistical support perspective. Overcoming that situation involved contributions by naval Supply practitioners in changing fundamental aspects of how the RAN undertook management of its Supply function so as to improve the operational capability of the Navy.

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243 James Goldrick, "A Fleet Not a Navy; some Thoughts on the Themes," in *Southern Trident - Strategy, History and the Rise of Australian Naval Power*, eds. David Stevens and John Reeve (Crows Nest, N.S.W.: Allen & Unwin, 2001), 291-295, page 295

244 Personal Communication from Rear Admiral David Campbell, 28 June 2012. email. Page 1

RAN Logistical Support Evolution with the Influence of the USN

Burrell was pleased with the decision by the Government to acquire the DDGs and remarked "…there was not the slightest doubt that the Charles F. Adams (CFA) class filled the bill exactly."[245] He went on, however, to reveal his reservation about support for the ships in saying: "My nagging worry concerned the handling of two differing types of stores ashore."[246] Burrell's concerns proved to be valid and had significant consequences for operation of the ships over many years. Commodore Cooper is of the view that follow-on-support for the Adams class was inadequately provided for. He comments:

> "Bill Rourke[247] was sent off with a couple of dockyard people to set up in the shipyard in Bay City…No-one had given any thought to supply logistics support afterwards. These were key words we learnt in America; the word logistic support was an alien terminology and concept to Australia. We had just relied on the RN and we were just treated like an arm of the RN and if we had a problem or wanted to order spares we just tapped in…As a consequence the RAN supply system had given no thought to the subsequent support of the DDGs."[248]

In February 1966 the 4th Naval Member advised the Naval Board that although *Perth* was due to return to Australia in less a month, orders for its spares had not yet been despatched from Australia and delays would be incurred in supporting the ship on its return.[249] The RAN stores support system in place when the DDGs were acquired appears to have involved incomplete knowledge of what spare parts the ships carried from the outset. That lack of knowledge was further compounded by support of the ships being primarily obtained and paid for by virtue of their service with the USN in Vietnam, a situation reflected in remarks by David Campbell who noted:

> "…the only thing that helped tide over those initial very difficult years was the Fleet's involvement in Vietnam...the high operational tempo which exacted tough demands on the ships and their support…ships enjoyed direct access to

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245 Henry Burrell et al., *Mermaids do Exist*, page 263
246 ibid
247 Commander William (Bill) Rourke was the commissioning Marine Engineering Officer of *Brisbane*. He retired as a Rear Admiral and died in November 2012.
248 Interview with Commodore Ormsby Cooper, 15 September 2011. Page 25
249 Commonwealth of Australia, *Naval Board Minutes, 1966. 4th NM Minute 400/251/78. Dated 17 February 1966.*, Vol. NAA: A2585, 1-7/66 (Canberra: National Archives of Australia)

> that veritable Aladdin's Cave, the SERVMART at NSD Subic Bay. Ships returned from Vietnam, virtually gunnels under, with stuff of which the system in Australia had no knowledge had been procured."[250]

As operations in Vietnam drew to a close, it brought notice from the USN that the RAN's future support of the DDGs would have to be obtained and financed through a separate agreement.[251] In explaining the issue, it was noted that "From the time of their commissioning in 1965-1967 to 1971, there was no established or funded system to make the RAN aware of, or ensure procurement of, USN equipment or documentation improvements and changes, or to obtain the information and assistance necessary to support the DDGs."[252] That situation had led to the RAN losing configuration control of their newest and most important surface combatants.

In general terms, 'configuration control' is a management method for accurately knowing the complete detail of a piece of equipment or system, and controlling its rate and state of modification. From that detail, for instance, can be derived an accurate list of spare parts to be purchased and carried, information to be incorporated in repair manuals, as well as guidance for the training curriculum for those who operate and maintain the equipment. These elements are interrelated and a failure to effectively manage one aspect will adversely affect others to varying degrees. When there is a major failure of configuration management it can lead to serious outcomes, and in the event that the configuration of an entire ship cannot be verified, then its current and future safe operation and performance is placed in jeopardy. In essence, the RAN Supply system had failed, not least because it did not establish and apply the methods and procedures of the USN which it needed to adapt to ensure the support of its newest ships. Its dependence upon RN methods had proven inadequate for its purposes.

This situation precipitated the RAN's undertaking of considerable remedial action to return the status of the ships to the point where their individual configurations were correctly documented. In that laborious process, the RAN used the USN practice known as Supply

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250 Personal Communication from Rear Admiral David Campbell, 28 June 2012. email. Page 3

251 Royal Australian Navy, *ABR 5296 - DDG Follow on Support Manual (SPC.DS.28)* Canberra: Sea Power Centre Australia, 1978, paragraph 0101

252 ibid. Paragraph 0102

Operations Assistance Programme (SOAP),[253] which it trialled in 1966 after a report was made by Ian Crawford based on his knowledge of the USN logistical system.[254] SOAP was adopted by the RAN in 1969 and Crawford notes that when Captain Doyle[255] was in command of *Melbourne* he undertook the same SOAP exercise and found that only 60% of that ship's equipment was properly supported.[256] The previous RN methods used by the RAN were not as thorough or focussed, and were shown to be inadequate for the management of logistical support. The experience gained by the RAN in supporting its DDGs in Vietnam and then learning through remediating its failure to manage the configuration of the ships added considerably to its collective understanding of what was needed logistically by a modern Navy.

RAN Supply Branch Professionalism

In 1965 the outgoing CNS, Vice Admiral Harrington, drew attention to "Inadequate Logistic Support" and noted that the RAN had chosen to expend funds on new ships rather than on maintenance.[257] He went on to criticise aspects of unsatisfactory naval dockyard performance resulting in ships being at less than 50% readiness for operations.[258] In responding to Harrington, in a note to the Minister for the Navy, Mr Chaney,[259] Mr Sam Landau, the Secretary of the Navy, appears to have interpreted Harrington's remarks *inter alia* as criticism of the performance of the civilian officers of the Department in procuring materiel.[260] Landau chose to highlight the remarks of CNS Vice Admiral Collins in his 1955 Haul Down Report, wherein he quoted Collins as saying "Since the days of Pepys, stores provisions and supplies

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253 "What is SOAP?" *Royal Australian Navy News,* 24 September 1976, Vol19 No19, Page 7. SOAP enables confirmation that the spares holdings of a ship correctly match the equipment it carries. Of itself it does not prevent control of a configuration being lost, which instead requires the correct management of records and associated information. A precursor to SOAP is physically checking and tagging every item of equipment in the ship for its status – known as Validation. See: Personal Communication from Rear Admiral David Campbell, 28 June 2012. email. Page 2

254 Interview with Rear Admiral Ian Crawford, 30 May 2012. Page 11

255 Commanding Officer of *Perth's* first Vietnam deployment. Later Rear Admiral.

256 Interview with Rear Admiral Ian Crawford, 30 May 2012. Page 38

257 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral Sir W H Harrington 1965*, Vol. NAA: A1209, 1967/7451 (Canberra: National Archives of Australia), page 4

258 ibid pages 4-6

259 Commonwealth of Australia, *Personal Papers of Prime Minister Menzies: Haul Down Report by Vice Admiral Sir Hastings Harrington [Includes Comments by Alan McNicoll and Secretary, Department of the Navy, and Correspondence from Hon F C Chaney Re Skyhawk Aircraft]*, Vol. NAA: M2576, 51 (Canberra: National Archives of Australia) Secretary to Minister for the Navy dated 23 March 1965, pages 8-9.

260 ibid page 9. The Fourth Naval Member was responsible for stores matters, but the Secretary was responsible for financial administration, control of expenditure and civilian personnel.

have been procured for the Navy by the civilians. I am convinced that this is the right answer…"[261] Collins was clearly of the view that no change was necessary to RAN procurement arrangements, and 10 years later, as the DDGs were entering service, neither was Landau. Harrington's report demonstrates more broadly his frustration in leading an organisation which needed to change, but he was severely constrained by its long standing principle of applying traditional methods. Such circumstances had contributed, as Harrington saw it, to the RAN not being fit for purpose, or prepared for the future.[262]

In regard to officers of the Supply Branch, Rear Admiral Campbell notes "…in those days, the specialisation was Supply & Secretariat, with the emphasis on the Secretariat. The successful career path, historically, was Secretariat. Most Supply Officers busied themselves with Captain's Office duties and pay and accounts." [263] By 'Secretariat', Campbell refers to a wide range of administrative matters on which a Commanding Officer or Flag Officer needed advice. His remarks are consistent with those of CNS Collins and recognise the then primacy of civilians in supply support in the Department of the Navy. Campbell continues: "Real interest in supply matters came to officers fairly late in their careers. The advent of the DDG changed all that."[264] Lieutenant Murray Forrest had been *Hobart*'s Deputy Supply Officer and considers that the British method of supporting ships did not meet the needs of a modern Navy and was unsatisfactory. He comments, like Collins, that it dated from the days of Pepys and "…was based on methods adopted over hundreds of years of experience, but it was mainly driven by their civilian organisation ashore and so was ours."[265] The contrast between the RN and USN support methods was stark, and Forrest considers that with the acquisition of the DDGs the Supply Branch "didn't know what we were getting ourselves into."[266] The RAN's experience of USN methods and practices gained through the DDGs was eventually internalised into its own methods and led to considerable change. Forrest remarks:

> "…the Americans… were far more professional… had uniforms all the way throughout their system and as it turned out that's what we did probably 15

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261 ibid pages 8-9
262 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral Sir W H Harrington 1965,* page 3
263 Personal Communication from Rear Admiral David Campbell. Page 1
264 ibid
265 Interview with Rear Admiral Murray Forrest, 9 December 2011. Page 3
266 ibid page 20

> years later…when we were doing our project work, took charge of our support and put uniforms in at the various successive levels …I've got no doubt that that was forced on us by our experience with the USN."[267]

Forrest went on to comment on the broader aspect of how the RAN itself was not ready for the DDGs. He notes "I don't think the Navy was well prepared for the DDGs. I think they were hit by a runaway train and, like the Supply organisation, they had to pick up the pieces very very quickly…"[268] Overall, Forrest considers the DDGs to have had a major impact on the evolution of the RAN and to have contributed to the cutting of the umbilical cord with the RN.[269] He concludes that acquisition of the DDGs "…was just the making of our Navy really."[270] As a consequence of introducing the DDGs and its experience in Vietnam particularly, the RAN created a Fleet Supply Team organisation, based in Garden Island (Sydney), modelled on that of the USN. Subsequently, the RAN was able to arrange for a succession of USN officers to serve on exchange with the RAN who helped it move towards the professional organisational support arrangements that Forrest, Campbell and others had experienced with the USN at Subic Bay and elsewhere.[271]

Commander Ian Crawford had been working in the Australian Embassy in Washington DC when he was posted as the commissioning Supply Officer of *Perth*. During his time in the US he had become familiar with the USN method of supporting ships and regarded it as superior to that in use by the RAN. He believes the RAN Supply system became more sophisticated as a consequence of acquiring the DDGs. He remarks "…we broke away from the gunner's stores the engineer's stores, we developed onboard rationalised load lists and arms lists, and I think food was better understood... total onboard support (was) integrated under the Supply Officer."[272] Gunnery and engineering stores were previously managed independently by the gunnery and engineering departments which interacted independently with the shore based naval stores organisation. The consequence being that ships were not always aware of the stores that they should carry, as compared with those that they did. As Campbell notes, the

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267 ibid page 3
268 ibid page 23
269 ibid page 4
270 ibid
271 ibid page 27
272 Interview with Rear Admiral Ian Crawford, 30 May 2012. Page 34

Supply career development structure as it existed before acquisition of the DDGs did not lead to the creation of the level of Supply professionalism needed by the RAN, and it had to change.

Crawford reflects similarly on how the career structure for Supply Officers changed to match their new responsibilities for logistics, and moved away from the Secretarial role to one much more focussed on the full scope of Supply.[273] He remarks that RAN Supply sailors (such as himself) received very good training from the USN, but steps were not taken to ensure that a similar level of expertise could form and flourish in Australia. In short, the RAN did not follow through on its initial training investment.[274] Like Crawford, Forrest also considers that the training received by RAN supply officers in the US was not of the same standard as that received by the technical branches. The Supply School at *Cerberus* relied on material sent to it by the Supply Officers of *Hobart* and *Brisbane* as to what should be taught about the DDGs and the USN Supply system. Acquisition of the ships did not include the introduction of relevant supply training for the RAN.[275]

David Campbell had been the Australian Naval Attaché to the United States as a Commodore, and is of the opinion that the personnel exchange programs and development of Cooperative Logistics Support Arrangements (CLSA) with the United States had been essential to sustaining the broader RAN operational capability, and could be traced directly to the acquisition of the DDGs.[276] Campbell also remarks that the DDGs caused a transformation in logistical and modern engineering supply support, and in this sense the ships were transformational for the RAN.[277]

Over a period of approximately 10 years from about 1983, Campbell notes that the RAN Supply Branch made significant progress in improving its professionalism.[278] The Supply School syllabus was thoroughly reviewed and updated for both officer and sailor training so that the training was relevant to contemporary requirements.[279] The experience and knowledge gained by individuals such as Forrest, Crawford and Campbell who had gained USN Supply experience through their DDG service, aided that change. This contributed positively to the

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273 ibid page 36
274 ibid page 38
275 Interview with Rear Admiral Murray Forrest. Page 20
276 Personal Communication from Rear Admiral David Campbell. Page 3
277 Interview with Rear Admiral David Campbell, 28 June 2012a. Page 3
278 ibid page 27
279 ibid

RAN increasing its professional competence in logistical matters and gaining confidence in its own procedures and processes. Through these efforts, the RAN became progressively less aligned with RN practices, and instead implemented those developed or adapted to meet its own purposes which, to a large degree, were based on USN practices first encountered through operation and logistical support of the DDGs.

Broader Impacts on the RAN of the DDGs

The impact on the RAN of introducing the DDGs was not confined to those issues examined to this point, and broader implications were to become progressively apparent as their influence was increasingly felt in the Navy. An obvious and virtually inevitable consequence of acquiring the DDGs was for the RAN to form a closer working relationship with the USN. By government design, the DDGs were an element in Australia's policy of shifting its major security relationship from Britain to America. As an instrument of policy, the RAN would simply have to adapt. Arrival of the DDGs coincided closely with their commitment to combat operations in Vietnam, with the ships wearing the RAN's new ensign. The flag was a public statement of Australian allegiance, and could also be seen as the RAN adjusting its post-colonial relationship with the RN. Collectively these conditions meant that purchase of the DDGs had, albeit unintentionally and subliminally, placed the RAN on a path to greater self-reliance. On that path, it would have to identify what it needed from Australia's undeveloped national capabilities so as to deliver its future operational performance. Hence the RAN would need to learn what it meant to be a fully-fledged Navy, and find ways of explaining that circumstance to officials who controlled resources, as well as to political leaders.

As we have seen, in 1957 Prime Minister Menzies announced the policy of increasing the interoperability of Australia's Services with those of America. Australia had progressively become less inclined to think of itself as a member of the British Empire, and Australia's post-colonial society from which the RAN drew its members became progressively more affluent, cosmopolitan and egalitarian.[280] In the 1950s however, the RAN found itself in the position where, as Kathryn Spurling notes, the culture of its sailors was more aligned with Australian

[280] The changing character of Australia's society pervades Bolton's narrative of this period. See: Geoffrey Bolton, ed., *The Oxford History of Australia - the Middle Way*, Vol. 5 (1942-1988) Melbourne: Oxford University Press, 1986

societal norms than that of its officers.[281] Jason Sears comments that officers of the RAN were perceived as being isolated from that society, primarily because of their long and intimate association with the RN.[282] The DDGs therefore presented an opportunity for Australia's naval officers and sailors to learn to depend upon each other in a unique seagoing environment that was foreign to both.

These circumstances are examined through the experiences of people who were associated with the DDGs, who acted as both participants in and contributors to the broader changes which emerged. In so doing, it adds to the understanding of the pressures and influences on the RAN to adjust to its own national situation and become more Australian, and self-reliant in character.

Transition of Great Naval Power Relations

The 1957 Government policy of establishing greater interoperability with the United States was noted by the Naval Board. [283] But as we have seen, its members did not appreciate the degree of change to the RAN which that policy would ultimately bring about. Goldrick observes that there are distinct advantages for smaller navies in having a close relationship with those much larger because the benefits include sharing of knowledge and technologies, typically to the benefit of the smaller Navy.[284] Conversely, and highlighting the dangers of being overly self-confident, Goldrick also notes that "The history of smaller navies which have not maintained strong links with the great powers is not an inspiring one."[285] For the RAN to have been the beneficiary of centuries of RN experience was of inestimable value. For much of modern history the RN had been world's most powerful Navy, and from it the RAN had learned comprehensively about sea command, fighting at sea and warfare in general, as well as organisation, the value of education, training and practice so far as operational matters were concerned, and especially the importance of professional excellence. As the DDGs entered its force structure and the RAN was again about to engage in combat operations, it had been the

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281 Kathryn Spurling, *"Life in the Lower Deck of the Royal Australian Navy 1911-1952"* (PhD Thesis), UNSW Canberra, page 394

282 Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, page 419

283 Robert Hyslop, *Aye Aye, Minister: Australian Naval Administration, 1939-59* Canberra: Australian Govt. Print. Service, 1990 Page 3

284 James Goldrick, "A Fleet Not a Navy; some Thoughts on the Themes," in *Southern Trident - Strategy, History and the Rise of Australian Naval Power*, eds. David Stevens and John Reeve (Crows Nest, N.S.W.: Allen & Unwin, 2001), 291-295 Page 295

285 ibid

recipient of over 60 years of direct and intense RN tutelage. As the ships departed service almost 40 years later, the RAN's surface combatant force structure had totally transitioned away from its RN character and was predominantly of USN-origin. This was accompanied by a fundamental reorientation of its international connection towards the USN.

Commodore Ian Holmes remarks that the DDGs aided the transition of the RAN from the RN to the USN. He believes that "I think we have successfully locked into the best couple of navies…let's not forget we sprung from the world's largest and we've now tied ourselves into the world's largest, there are advantages for people like us." [286] His remarks echo those of Goldrick which point to the value of having powerful friends. As we have seen, when the DDGs were purchased, Australia's purpose in their acquisition constituted an expression of government policy to fundamentally shift the RAN toward the USN. Conversely, CNS Burrell would have preferred to remain closely coupled to the RN,[287] but in so doing he misread the new direction being taken by government. Vice Admiral David Leach had considerable experience with the RN over his career but supports the contention of the smaller RAN benefiting from its relationship with the USN, and also regards the DDGs as helping the RAN to adopt a more independent stance. He notes that the DDGs had improved the RAN's understanding of technology and that their impact on the RAN "…is enduring in that we're more independent, while America gives us all the help that we ever asked for, they are very conscious of a strong ally and give us more help than the Royal Navy would give us. So I think we've switched that … allegiance…"[288]

Commander Anderson acknowledges that the commitment of the DDGs to Vietnam operations prevented them from becoming more immediately part of the RAN, giving an impression of there being a DDG club, and remarks "… what probably made that more pronounced…was (until) '71 the only things they really did was go to Vietnam, come back, work up, go to Vietnam, so…everybody…was used to working with the Americans and the ships were never…integrated into the rest of the Navy."[289] Integration of the DDGs into the wider Navy only started to take place after the Vietnam War and, as Campbell notes, their appropriation for that operation coupled with being so obviously different from other ships had contributed

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286 Interview with Commodore Ian Holmes, 3 October 2011. Page 1
287 Henry Burrell et al., *Mermaids do Exist* South Melbourne: Macmillan, 1986, page 254
288 Interview with Vice Admiral David Leach, 14 March 2012. Page 29
289 Interview with Commander Antony Anderson, 24 August 2012. Page 44

to emergence of a 'them and us' environment in the RAN.[290] Notwithstanding concerns about an aura of exclusivity around the DDGs and disconnectedness from the RAN, their repeated involvement in Vietnam combat operations and working closely with the USN served to bring various forms of advanced naval knowledge into the RAN in a way that otherwise would not have occurred at the same rate, if at all.

Becoming more independent in thought and identity was brought into sharp relief in 1967 by a change of the RAN's most visible mark of allegiance: its ensign. CNS McNicoll had put a proposal to the Naval Board on 8 December 1965 that the RAN should change its ensign.[291] According to his survey of naval personnel "A small majority favoured a change now… a large majority favoured the Navy making a change itself rather than permitting external pressure to force a change…and that a majority believed it would be welcomed by most of the RAN."[292] Lieutenant Holmes was a member of *Hobart*'s crew as it was about to deploy to Vietnam in March 1967. He recalls "…I stood on the quarterdeck of HMAS *Hobart*, we were the ship that had been committed first to Vietnam, and we hoisted the White Ensign under which I had served and everybody else had served up to that time and we cried as it was lowered and the new one went up. Very, very emotional."[293] The most important consequence of adopting a uniquely Australian ensign was the simple clarity with which it showed members of the RAN, and Australia's public, that it was now unquestionably Australia's own Navy, and not an extension of the RN. Correspondingly, changing the ensign could be interpreted as giving the RAN a publicly indisputable responsibility for its own destiny and all that went with building and retaining its own value to its country. The RAN's relationship with the RN after that point could be expected to further adjust itself in uncertain ways.[294]

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290 Interview with Rear Admiral David Campbell, 28 June 2012. Pages 10-11

291 Commonwealth of Australia, *Naval Board Minutes 1965 (RAN White Ensign - 8 December 1965)*, Vol. NAA: A2585, 1965 (86-96/65) (Canberra: National Archives of Australia)

292 ibid

293 Interview with Commodore Ian Holmes. Page 39

294 Frame notes a 'certain restlessness' is present in an assertion by the RAN Naval Board which considered the RAN in 1961 to be self-sufficient. The Board's remarks give a sense of its belief in having independence from the RN. See: T. R. Frame, *Pacific Partners: A History of Australian-American Naval Relations* Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992, page 98. The sense of self-sufficiency or independence that the Board may have felt, as demonstrated by research for this thesis, did not extend to the RAN having the full freedom to decide its own future at that point.

David Campbell considers similarly that the impact of the DDGs on the RAN was profound and he remarks "…they were very much in the forefront of our naval thinking…they enabled us to do…projection into the area, no one else in the region had anything like it." [295] For the RAN to have had such a capable ship and to be able to demonstrate its professional competence provided Australia with a means of promoting its wider national interests wherever it sent the DDGs. In terms of identity, the RAN was thus demonstrably no longer British.

Captain Christopher Skinner became the Director for what emerged as the Anzac class frigate project. He spent five years in the UK taking an engineering degree and subsequent training courses and could contrast that experience with his DDG service. He notes that the RAN had inherited the long standing professionalism of the RN which was a positive attribute.[296] But with regard to his US experience he remarks "… the whole impact of the DDGs and my preparation for an involvement in all of these, showed me that there's a much better way of running any organisation, but particularly a Navy, than what we had so far learned from the Brits…"[297] Skinner's remarks echo the theme that the RAN needed to acquire the knowledge to make its own decisions based on its own requirements and circumstances, but that it had gained valuable expertise from both the RN and USN in equipping itself to do so.

Tom Frame notes that the RAN had been well respected by the USN during WWII,[298] and as we have seen, there had been no diminution of that sentiment when the USN first assessed the professional ability of the RAN to operate the DDGs. The relative ease with which the RAN DDGs worked with the USN during Vietnam operations fostered a closeness of relationships which Frame remarked had been absent in WWII,[299] and can be regarded as adding to USN confidence that the RAN was a competent and useful ally. In the same vein, it would have demonstrated that the RAN could hold its own with the world's most powerful Navy. In regard to Australia's broader geo-political circumstances and foreign policy options, the DDGs therefore provided continuity in terms of Australia being a respected and close ally of the most powerful nation in the world, thus making an important strategic contribution to its security and economic wellbeing.

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295 Interview with Rear Admiral David Campbell. Page 2

296 Interview with Captain Christopher J. Skinner, 1 February 2013. Page 1

297 ibid page 2

298 T. R. Frame, *Pacific Partners: A History of Australian-American Naval Relations* Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992, page 68

299 ibid

The DDGs were the first visible sign of the RAN's journey of change away from the RN and towards greater self-reliance, but after the later acquisition of the FFGs its transition to having the USN as its main naval friend became virtually unstoppable. That transition, however, made visible those hidden costs of infrastructure and resources to which it had enjoyed access from the RN. Initially this was replaced by virtue of the US alliance with all of its benefits, but eventually, as has been opined by Goldrick and Ruting, they would have to become recognised as an unavoidable real cost of Australia having an independent Navy suitable for its purposes.

Increased Self-Confidence and Self-Reliance

Although the choice of DDG acquisition had been made at Australia's political level, no qualms had been expressed about the ability of the RAN to assimilate the ships into its RN-origin force structure. The political confidence of the most senior naval leadership was in other ways possessed by members of the RAN in their day to day activities. They were focussed on being professional, but there was little obvious sense of the RAN's shift towards the self-reliance which was to follow introduction of the DDGs. Captain Ian Pfennigwerth had served in *Brisbane* and subsequently commanded *Perth* several years after its digital combat system upgrade. He was initially somewhat disinterested in the arrival of *Perth* from the United States, but his views changed over time. He recounts that the presence of the ships raised conversations amongst naval officers about their performance and differences from other ships of the RAN, but their longer term impact was still unclear. He notes "…they started to get this image of being the game changers - which they were, but we didn't know that." [300] Pfennigwerth recalls that there was a welcome for *Perth* when it first returned from America:

> "The Fleet sortied out from Garden Island to greet the new ship and there she was. And she was exactly like the pictures. But what struck me was how small she was in comparison with the view that these ships were big, they were powerful, they were fast, and they were all those things. But we could look down on the upper deck of *Perth* from the upper deck of *Yarra*."[301]

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300 Interview with Captain Ian Pfennigwerth, 26 July 2012. Page 19

301 ibid. *Yarra* at that time was a relatively new River class frigate built in Australia from an adapted RN River class design. Its main upper deck had a higher freeboard from the waterline than that of *Perth* and other DDGs.

Pfennigwerth adds that introduction of the DDGs had later been for him "A game changer…"[302] He goes on to say "…it was a major change in my concepts. It was a major change in how I saw you could actually fight a ship and its systems most effectively…That was the pinnacle of …that part of my career."[303] Pfennigwerth continues about the DDGs "…It was a vision of the future. There were no more powerful ships in our part of the world than those ships…resolutely handled…they were world beaters."[304] Like Campbell, Pfennigwerth thought it a positive expression of Australia's national capability for the RAN to operate the most powerful ships in the region and demonstrate its professional competence.

Combat operations bring new insights and lessons, and DDG deployments to Vietnam contributed to a toughening and maturation of the post-WWII RAN. Vice Admiral Walls contrasts the pre and post-Vietnam eras: "…back in the fleet of the say 1961…It wasn't a really serious Navy at all whereas by 1971, 10 years later, people were being shot at, shooting and involved in serious warfare so that had a dramatic impact."[305] Walls believes the DDGs contributed notably to the considerable changes happening in the RAN at the time. He remarks:

> "I think it caused a rethink of how we had gone about doing things. It was aided of course because other changes were happening at the same time…In a way it was a bit of an osmosis... if you think of the period from 67 through to 71… there was a very intense period there where the surface Navy was involved in war…people were killed and that's got a remarkable way of focussing people's mind and attention." [306]

The RAN benefited in other ways from its exposure to the USN and Skinner remarks how that experience helped the RAN gain a broader view of how to conduct itself as a Navy. He notes how the DDGs exposed the RAN to "… a very very large system which …is extremely well organised, far better than it may sometimes appear and far better than it sometimes gets credit for, into which it was a logical process to insert ourselves. Even to this day I still don't understand why the Brits do certain things in certain ways, whereas with the Americans, it's all

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302 ibid page 6
303 ibid
304 ibid page 60
305 Interview with Vice Admiral Robert Walls , 6 October 2011. Pages 6-7
306 ibid

explained."[307] Mr Andrew Johnson was the Chief Executive Officer of Tenix Shipbuilding at Williamstown, Victoria, and responsible for construction of the Anzac frigates. He also considers that the realignment of the RAN with the USN marked a positive change for the RAN. Johnson says that buying a mainstream US ship instead of the RN County class was "… a historic fork in the path for the RAN."[308] He believes that acquisition of the DDGs set the RAN on a new direction. Johnson remarks "… from here on the family became the USN and the RN became increasingly irrelevant…"[309] Skinner had similar thoughts about the benefit of working with American methods and remarks "… the most beneficial impact of the DDGs…was our introduction to the American way of doing business which we can relate to and learn from and build on and go even further in our own way, for our own needs."[310]

Captain David Cotsell regards the acquisition of the DDGs as a stage in a journey already begun and remarks "… their acquisition was effectively a milestone in a continuum, as the RAN transferred from… an RN squadron effectively, to an independent naval force interoperable with the US."[311] Cotsell considers that from the time when the FFGs entered service in 1980, the RAN became even more detached from the RN and this was concluded five years later with the repatriation of PWO training to Australia from the RN.[312] Through training its own warfare officers the RAN severed its dependence upon the RN for the development of its future leaders. Cotsell remarks that the DDGs moved the RAN towards a more uniquely Australian way of thinking, and that this was stimulated by the RAN learning from its American experiences.[313] He notes that the FFGs also subsequently had an important influence on the RAN in that by then its major warships had become predominantly of American origin, but operated to what had become RAN practices. He remarks "By the time the FFGs were approaching mid-life, the process of Australianisation of the Navy was pretty much complete. The systems changes, the training, the testing and missile testing off Kauai, the RIMPAC exercises, the Kangaroo exercises, the carrier had gone, we were writing our own doctrine

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307 Interview with Captain Christopher J. Skinner. Page 3
308 Interview with Mr Andrew Johnson, 17 December 2012. Page 21
309 ibid page 22
310 Interview with Captain Christopher J. Skinner. Page 3
311 Interview with Captain David Cotsell, 8 January 2013. Page 1
312 ibid. PWO training in Australia commenced in 1985. G. MacKinnell, "The SWOC - Australian Trained PWOs," *Journal of the Australian Naval Institute,* 11, 1, 1985, 45-46
313 Interview with Captain David Cotsell. Page 46

albeit informed by others…"[314] Cotsell's remarks offer a signposting of the critical steps in the RAN's transition towards self-reliance through its formative experiences, shaped through responding to its own needs.

Vice Admiral Chalmers believes that acquisition of the DDGs had a very positive impact in making the RAN more obviously Australian and gave defence and foreign policy options to Australia that it might not otherwise have had. Chalmers recognises that the DDGs came as the relationships between Australia and Britain, and the RAN and the RN, were in the process of change. He remarks:

> "... we got them at just the right time… as the British were withdrawing from East (of) Suez and…the Australian alignment was becoming closer with the United States. And I think that in terms of confrontation (with Indonesia), that was all part of our five power defence agreement… the RN style ships suited that…"[315]

He considers "…without the DDGs, we couldn't …have contributed in a meaningful way from our Navy in Vietnam. We certainly couldn't have contributed to the northwest Indian Ocean in our time up there, and we couldn't have contributed in the first Gulf War and subsequent deployments in the Middle East."[316] The latter deployments were all undertaken by FFGs and Anzac frigates, but continued to show that meeting government foreign policy objectives in concert with the major US ally had become integral to the RAN's professional capability and mission. Since Vietnam, the DDGs had given foreign policy decision makers confidence that the RAN could play an effective part in support of Australia's evolving independent diplomacy, which in turn contributed to the RAN's evolving belief that it was competent in such a role.

Chalmers also observes that if the alternative option to the DDGs had been chosen, the County class destroyers, then the evolution of the RAN would have been that much slower: "…if we had bought the Counties we would (have) ended (up) a slightly larger version of the New Zealand Navy."[317] Chalmers' point is revealing in terms of the different trajectories taken by two British Commonwealth navies. The Royal New Zealand Navy (RNZN) had also acquired ships of RN-origin and maintained good relations with the USN, but its ships had not participated in Vietnam. When New Zealand's Government in 1985 refused access to a USN

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314 ibid
315 Interview with Vice Admiral Donald Chalmers, 8 February 2013. Page 1
316 ibid
317 ibid page 42

warship over questions about nuclear weapons,[318] the RNZN found itself shut out of its USN relationship for a considerable period of time. Consequently the RNZN's knowledge, practices and methods evolved differently from those of the RAN, which had become a predominantly USN-oriented Navy in terms of operational capability. The RNZN was unable to make the transition made by the RAN from the RN to the USN, and it is credible to see this divergence as a consequence of the distinctly different foreign and therefore procurement policies adopted by each country.

The RAN's growth in its confidence was aided by the accumulated experiences and self-belief of those who had to adapt to new circumstances, such as first encountered by DDG crews in commissioning the ships, in their Vietnam operations, and subsequently. That it had acquired such confidence was fortuitous because the 1957 political shift of Australia toward the United States in a security sense left the RAN with little choice but to adjust similarly, regardless of its readiness to do so. Acquisition of the DDGs took the Navy into a new era and on to a path towards a new national naval identity in the context of Australia's post-imperial security circumstances that would have not been possible to the same extent without their presence. The RAN's long standing intimate association with the RN had been critical in forming the essential competencies needed to start such an evolution toward self-reliance, to which operation of the DDGs had made such an important contribution.

Experiencing Professional Growth

As we have seen, introduction of the DDGs marked a point of transition for the RAN, and it was inevitable that some degree of change would be precipitated in the RAN because of that shift. The personal experiences of those who participated in events which later had an important future impact on the Navy add greater understanding of the professional naval environment over that the time, thereby helping explain its changing character.

Navies are made up of individuals who must typically work as a team, and the calibre and strength of purpose of those individuals fundamentally shape and form its persona, and ultimately its real capability. Examination of the professional human dimension enables a sense of how people's professional development evolved and contributed to their application

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318 Thomas-Durrell Young, "ANZUS Naval Relations, 1951-85," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 296-315

of accrued knowledge and skills. Collectively, individuals have attested how that development aided the growth of their self-confidence in meeting new and novel circumstances, thereby positively reinforcing their morale. The following examination considers the perspectives of a number of RAN officers, some of whom commissioned a DDG, and the role of the ships in shaping their attitudes. Of these officers, before retiring from the RAN three reached the rank of vice admiral, four reached rear admiral and one reached commodore. Their testimony imparts a sense of how their DDG service influenced the evolution of the RAN as they subsequently assumed greater responsibilities.

Rear Admiral Murray Forrest joined *Hobart* as a very junior Lieutenant,[319] and his situation was one where he was in the early stages of his career with little experience and much to learn. Similarly he had very little knowledge of either the USN or what to expect on his arrival. By succeeding in that role, Forrest believes that the DDGs gave him, in a professional sense, an "extraordinary opportunity" and that through that development he gained important personal and professional perspectives valuable for the remainder of his successful career.[320] Rear Admiral David Campbell is also clear about just how important the DDGs were not only to the RAN but also to himself. Campbell reflects: "They were just central to the Navy that I was in. They were transforming our transition from the RN to the USN and that in turn led to transition from USN to RAN."[321] In 1982, Vice Admiral David Leach became the first Chief of Naval Staff to have commanded a DDG, thereby clearly marking a change in terms of command of the RAN from the aircraft carrier period to the DDG period. Leach had commanded *Perth* on its second Vietnam deployment and later became the RAN Fleet Commander. He believes the DDGs had had an important impact on him personally. He remarks: "We spent 80% of our time at sea, we were never not able to go anywhere we were supposed to go for any defect at all and all the equipment worked. It had a big effect, it sort of moved me on I think in technical knowledge and appreciation - and pride."[322] Pride can come from an individual overcoming considerable odds or high achievement in a myriad of circumstances. But for Leach, his pride came also through the efforts and results of others – his crew. Knowing their commander is

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319 Interview with Rear Admiral Murray Forrest, 9 December 2011. Page 2
320 ibid
321 Interview with Rear Admiral David Campbell. Page 2
322 Interview with Vice Admiral David Leach. Page 29

proud of his crew is recognised as a powerful morale building and motivating force for those who depend on their leaders in battle.[323]

Formative experiences can become long lasting memories and shape personal convictions, which can later be applied with great authority by those who reach high rank. Vice Admiral Robert Walls notes that the action he had seen when a Lieutenant in *Hobart* on its first Vietnam deployment, coupled with earlier less demanding operational experiences, led him to believe that high professional standards were essential for operational success. As he increased in rank and authority, Walls would insist on the achievement of such standards by himself and others. He recalls how he had expected that standard "…when I was…XO of *Perth* or Captain of the *Brisbane*, indeed even the Fleet Commander, (because) when you get shot at …you see what happens if people are not sufficiently well trained and sufficiently professional in their dealings with situations which might arise unexpectedly."[324] He notes that his experiences "… caused me to approach my activities professionally in a fairly…unyielding way thereafter and it certainly shaped and influenced me for the rest of my career."[325] Walls' views about setting and enforcing standards inculcated in war points to the unforgiving nature of naval conflict where the time taken to re-learn the lost lessons of how to win has historically exacted a high price on those who have forgotten them. In essence, Walls meant that those same high professional standards needed in war had to be enforced in peace, a point echoed by Admiral Sir John Woodward RN, the naval task group commander during the Falklands War.[326] With regard to selecting peacetime admirals Woodward notes "…the vital thing is to have them in the right place at the critical time – that is, at the beginning of a conflict. A great deal easier said than done."[327]

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323 The mutual sense of pride between crew members and their leaders is a theme which permeates several contributions recounting modern war at sea. See: John Reeve and David Stevens, eds., *The Face of Naval Battle: The Human Experience of Modern War at Sea* Crows Nest, N.S.W.: Allen & Unwin, 2003

324 Interview with Vice Admiral Robert Walls. Page 5

325 ibid

326 Sandy Woodward, *One Hundred Days : The Memoirs of the Falklands Battle Group Commander*, ed. Patrick Robinson London: London : HarperCollins, 1992. For the official history of the Falklands see: Lawrence Freedman, *The Official History of the Falklands Campaign* London: London : Routledge, 2005

327 Andrew Gordon, *The Rules of the Game : Jutland and British Naval Command* Annapolis, MD: Naval Institute Press, 1996 Page xii

Living in a ship provides a unique opportunity to experience the intimacy of close quarters accommodation and to understand more clearly the interdependence of the officers and sailors who have to collectively ensure that the ship performs to a high professional standard. There are features of shipboard life which leave lasting impressions. To David Campbell, the DDGs had unique features he remembers fondly, and of his first impressions when arriving in *Hobart* he recounts "How new it was; everything was new; it smelt new. DDGs had that particular scent that they never lost, that smell of rubber…American ships smell like that; British ships have an entirely different smell."[328] He remarks "…but the thing that struck me walking on board for the first time was how new and modern and wonderful it was. Very satisfying." As a relatively junior officer in *Hobart*, Campbell as its Deputy Supply Officer had to work very closely with his senior colleagues and found that engineering officers came to understand that they did have to rely upon the Supply system for support.[329] Similarly, the Supply organisation had to comprehend what their primary customers really needed, and so it had to adopt a much greater customer focus such as it had learned from its USN counterparts. Campbell's later leadership responsibilities as a Rear Admiral in the role of Naval Support Commander enabled him to apply the logistical knowledge and experience gained in the formative years of his career in improving how the Navy supported its Fleet.

Campbell comments further that although he had accumulated much professional experience elsewhere he, as others have said similarly, "…came of age as a naval officer in the *Hobart*."[330] He had the sense that his DDG experience added significantly to his professional development and effectiveness as a naval officer, and to the standards to which he aspired. He had an impression that the DDGs were crewed by some of the best officers in the RAN, and by virtue of their working intimacy they shared a mutual respect and desire for high standards.[331] He remarks: "I'm very mindful of the fact that when I was in *Hobart* we really had a First XI: a four-ring Captain, the Heads of Department were all Long Course qualified…and we were AUSDESRON 1,[332] and that meant we were first in every sense of the term."[333] To serve in such an environment was professionally rewarding for a motivated individual who could be

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328 Interview with Rear Admiral David Campbell page 10
329 ibid page 17
330 ibid page 18
331 ibid page 11
332 The First Australian Destroyer Squadron
333 Interview with Rear Admiral David Campbell, page 11

expected to build upon that experience. The DDGs were thus highly regarded as ships in which personal development was encouraged and Campbell's remarks imply that he viewed them as breeding grounds for professionalism, itself a precondition for the RAN gaining the confidence needed to be more independent in thought and behaviour, as was becoming increasingly necessary.

Rear Admiral Peter Purcell also believes the impact of the DDGs on him as a naval officer was very positive, and comments "…I enjoyed the ships, I enjoyed the technology in the ships…"[334] Having been trained in the UK and the United States Purcell was able to contrast the differing ways in which the RAN had started to utilise its WEEOs as a consequence of acquiring the DDGs. In RN ships, officers such as Purcell were occupied in managing equipment and ensuring its readiness for operations, whereas in the DDGs they were also integral to the operation of the weapon systems and the fighting of the ship. The advantage was that a highly qualified engineering officer who was intimate with the technical details of the system could give immediate advice on its performance in operational circumstances. Purcell remarks:

> "I enjoyed the fact that it was quite different to the approach being adopted by the Brits. For instance I went to *Hobart* on a second deployment, I was the missile systems engineer among other things; had I gone to a British equivalent, I would have been one of seven engineers looking after the electrical sides of that ship."[335]

After it was attacked by friendly aircraft on its second deployment,[336] Purcell was involved in assessing *Hobart's* damage and its consequences.[337] He also comments that most of what he had done as a naval officer throughout his career had been positively influenced by his DDG experience: "…I think the whole of my thinking. My senior jobs were in the worlds of project management and I learnt what I learnt about project management in the field from the Americans. So the things that they valued…to make a project work were the sorts of things that I came back and valued…"[338] Purcell's testimony adds to the impression that the DDGs were places where individuals could thrive as well as being members of a team. Their sense of

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334 Interview with Rear Admiral Peter Purcell, 23 April 2012. Page 15
335 ibid
336 "HMAS Hobart Hit," *Royal Australian Navy News,* 21 June 1968, Vol 11 No 13, Page 1
337 Interview with Rear Admiral Peter Purcell. Page 22
338 ibid page 45

self-worth was increased and their confidence in meeting their professional responsibilities was enhanced.

Commodore Richard Menhinick considers that his service in DDGs enabled him to become more accomplished as a naval officer through experiencing a higher degree of professionalism exhibited by his fellow officers. He notes "…it actually took you from being a bit of an enthusiastic amateur to being a bit more of a serious professional…"[339] Like others, Menhinick thought the DDGs were the best ships in the RAN and in considering the positive impact they had on the self-awareness of individuals he remarks "…if you got sent to one it kind of sharpened you…"[340] The 'sharpening' Menhinick refers to, as we have seen involved the sometimes unstated but expected outcome of high professional standards on the part of all naval officers in the DDG environment. No doubt this was expected in other classes of ships, but the remark by Campbell of DDG officers being of the 'First XI' suggests that their juniors could be mentored in a manner not typical in other classes of destroyers and frigates.

As we shall see in Chapter 6, for an extended period the RAN's most senior leadership was drawn from officers who had commanded a DDG. Experiences gained by an officer contributed to how an individual would later exercise their judgement, and judgement of course counts for much at senior levels of a Navy. Rear Admiral Guy Griffiths contends that those officers who led the Navy incorporated their DDG experience into that role. Griffiths believes that "…the DDG culture expanded one's mind…much more than the limited capabilities of other ships would."[341] He goes on to say that the RAN had "…a DDG group which…sat at the top of the outfit once the carrier had gone…"[342] Vice Admiral Chalmers considers that his experiences with DDGs had a substantial impact on his career. He remarks "… without the DDGs, I don't believe that I would have got to where I got to. I think there was a tremendous learning curve in the DDG."[343] The knowledge and experience that Chalmers and his fellow DDG Commanding Officers acquired became a common point in the development of the senior leadership of the RAN. The experience of commanding the most powerful and modern ships in the fleet provided advantages that others were unable to obtain, and Chalmers continues "…I think that having those experiences and doing that, it sets

339 Interview with Commodore Richard Menhinick, 12 July 2012. Page 2
340 ibid
341 Interview with Rear Admiral Guy Griffiths, 13 and 19 January 2012. Page 38
342 ibid page 39
343 Interview with Vice Admiral Donald Chalmers. Page 1

you up with a far broader view of what it is you can achieve in the longer term in your career."[344] The 'broader view' noted by Chalmers can be extended to the comment by Sears as something missing in the earlier training and development of the RAN's officers.[345] Sears notes that the RN model had been useful in the short term for developing operational expertise, but it did not produce the officers needed to lead the entire Navy.[346] Those broader experiences available to RAN officers through service in a DDG helped the RAN overcome that limitation to a degree, but a more comprehensive effort was not introduced until 1979, when the RAN established a formal education and training program for officers which dealt with higher naval principles as well as concepts of modern leadership and management.[347] Until that time, only a limited number of officers had had the same opportunity as Chalmers.

These testimonies of officers with intensive personal experience of the DDGs indicate a high degree of professional self-realisation in a variety of essential and axiomatic ways which they regarded as attributable to their service in DDGs. They acknowledge how the DDG environment supported their professional development and how they became more mature and confident in their abilities, which contributed to their having a high morale and sense of self-worth. We can see how their individual experiences enhanced the collective capability of the RAN in terms of its self-reliance as it evolved and grew less dependent on the RN.

While the pathway of a naval career can be quite different for each individual, these personal experiences played a critical role in shaping and moulding these men in their professional lives. Had they not served in DDGs, then it is plausible that they would not have become as professionally successful as they did, and that the two-way interplay of their personal development and its reinvestment in the Navy would have not been as productive as it became. Collectively their stories are significant evidence of the RAN's progressive

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344 ibid. Chapter 6 shows that from 1982 to 2008, with one exception, the Chiefs of the RAN were all former Commanding Officers of DDGs.

345 Chalmers had graduated from the USN War College prior to assuming command of *Perth* and hence had been exposed to a broadly based senior staff officer development program. That course was typically attended once per year by RAN officers of the rank of commander. The then Australian Joint Services Staff College also accepted students of commander rank, but in limited numbers.

346 Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, page 418

347 Guy Griffiths attended the RN Staff Course in 1954 and later as a Rear Admiral established the RAN's own Staff College in 1979 to train and educate officers of Lieutenant Commander rank in the higher principles of naval matters as well as advanced management subjects. See: Interview with Rear Admiral Guy Griffiths, 13 and 19 January 2012. Pages 13 and 67.

development of its modern character. It was formed through gaining professional maturity in the form of self-awareness, personal confidence, and self-reliance, all significantly aided by the presence of the DDGs. In this way the RAN was becoming more independently Australian, and as will be seen, those who served in the DDGs contributed to its culture shifting more toward being reflective of contemporary Australian society.

Impact on the Culture of the RAN

How the culture[348] of the RAN might be impacted by Australia's acquisition of the DDGs was not evident in the consideration of Cabinet members when taking their decision to strengthen Australia's relationship with the United States. They viewed the RAN pragmatically as an instrument of their policy and its RN and USN relationships were matters for it to negotiate. Although CNS Burrell was confident of the RAN being able to operate the DDGs[349] he was personally of a staunchly British culture,[350] and it is highly improbable that he could conceive of the scale of professional and cultural transformation to be undertaken by the RAN in the ensuing four decades.

The progressive shift of the RAN's force structure away from the RN towards the USN[351] brought with it new professional experiences and exposure to different concepts and methods, all of which contributed to the RAN becoming more professionally independent. Experiencing that transition also impacted on its culture, which gradually adjusted itself to become more characteristically Australian in nature and, as we shall see, the DDGs were important catalysts for that change.

After WWII the character of Australian society was in transition, brought about by a combination of the White Australia policy[352] with a major change in population mix through an influx of European refugees and assisted migrants.[353] The cumulative effect was that, as Australia's involvement in the Vietnam War drew to a close, its citizens were no longer

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348 In this thesis, the RAN's 'culture' means the accumulated practices and habits by which it did business. Culture encapsulates organisational values and the beliefs of individuals, as well as their working practices and social norms that collectively shape the behaviours and character of people; it synthesises 'how things were done', which can change over time. See Chapter 1.

349 Henry Burrell et al., *Mermaids do Exist* South Melbourne: Macmillan, 1986, page 263

350 ibid page 254

351 See Appendix A

352 Geoffrey Bolton, ed., *The Oxford History of Australia - the Middle Way*, Vol. 5 (1942-1988) Melbourne: Oxford University Press, 1986, page 39

353 ibid pages 106-110

unquestioning about Australia's allegiance to Britain and were ready to be more independent in thought and action. This was reflected in the election of Gough Whitlam as Labor Prime Minister in December 1972, after more than two decades of Australian leadership by the Conservative Coalition.[354] Whitlam espoused a robust middle power role for Australia, as opposed to the traditional orientation towards Britain and latterly the US.[355]

As we have seen, CNS Harrington's sense of impotence to change the Navy, even though he was its leader, not only suggests that its conservatism and aversion to change were deeply entrenched, but also that its senior military and civilian leadership were ill-prepared to address its future. Sears notes that Hyslop had concluded that senior RAN officers had failed to perform effectively at the highest levels,[356] and Harrington could be seen as the harbinger of a different type of naval officer in recognising the dearth of ability in strategic thinking and modern management skills with which he had to contend. In 1948 it was expressed by the RN's last CNS of the RAN, Admiral Sir Louis Hamilton, that "…a navy does not drop from the clouds…it is in many respects the greatest expression of a nation's genius.[357] Leadership of such an organisation requires the development of much professional skill and judgement acquired over many years, beyond being an expert and competent seagoing officer. Interaction with senior politicians is essential at that level, at which being effective as a naval leader means discerning and understanding desired political outcomes but without becoming unduly politicised oneself. As we have seen, CNS Burrell seems not to have been fully attuned to the political direction being taken by Senator Gorton who regarded acquisition of the DDGs as the means by which the RAN could help to achieve a strategic goal for Australia.[358]

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354 ibid pages 212-216

355 For a summary of the period of Whitlam's political influence see: Geoffrey Bolton, ed., *The Oxford History of Australia - the Middle Way*, Vol. 5 (1942-1988) Melbourne: Oxford University Press, 1986, pages 215-244

356 Jason Sears, *Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50* page 2

357 David Stevens, ed., *The Australian Centenary History of Defence: The Royal Australian Navy*, Vol. III Melbourne: Oxford University Press, 2001, page 1

358 Hyslop also noted that "…antipathy to politics and politicians was strong amongst naval officers." See: Jason Sears, "*Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50*" (PhD Thesis), UNSW Canberra, page 2

The remark by an RN Admiral to Griffiths about not being able to understand why the RAN had bought "American rubbish"[359] is telling, in that it suggests that some senior members of the RN regarded the RAN as incapable of important judgements about its own future. That view may not have been based solely on hurt British pride that a USN warship was regarded by the RAN as being superior to an RN warship. As Grove has shown,[360] the RN regarded the RAN with mixed views, but there seems to have been an underlying RN sense that the RAN was not yet ready for such independence of thought.

Vice Admiral Walls' belief that the RAN of pre-Vietnam operations was less professional than afterwards corresponds with the view of Frame who, in his examination of the 1964 loss of *Voyager* in collision with the carrier *Melbourne*, recounts how a series of RAN accidents involving ships "…between 1958 and 1963 created doubts about its professional standards, and the quality of its leadership and administration."[361] The effect of those accidents was to draw intense public and political attention to a Navy to which the press had been largely indifferent and "….which occupied a position at the fringe of public life."[362] Frame notes that the accidents came at a time when the RAN was seeking to achieve "…greater independence from the Royal Navy under Australian leadership."[363] Implicit in Frame's remarks is a sense of separateness from Australia's broader society on the part of members of the RAN, and of its officers particularly, on which Sears also comments.[364]

The time taken to reach high rank in the RAN meant that its senior leaders were at least one generation removed from their juniors. Frame contends that in the mid-1960s RAN senior officers were still perceived as having a British upper class manner[365] whereas, as Bolton has

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359 G. Griffiths, "DDGs in Vietnam: HMAS Hobart 7 March to 27 September 1967," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 330-337 Page 331

360 Eric Grove, "Advice and Assistance to a very Independent People at a most Crucial Point: The British Admiralty and the Future of the RAN 1958-60," in *Maritime Power in the 20th Century - the Australian Experience*, ed. David Stevens (St Leonards, N.S.W: Allen & Unwin, 1998), 135-155

361 T. R. Frame, *Where Fate Calls : The HMAS Voyager Tragedy* Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992 Page 342

362 ibid

363 ibid

364 Jason Sears, *Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50* page 419

365 T. R. Frame, *Where Fate Calls : The HMAS Voyager Tragedy* Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992 page 4

observed,[366] the society from which their juniors were recruited in the 1950s and after, was increasingly egalitarian. The combination of their authority, senior rank and its symbols, coupled with naval customs and traditions, was not conducive to encouraging juniors to be part of a conversation in which the future direction of the Navy was open to discussion or question.[367] The primary experience of senior officers of the RAN in that era had been one of sea-going operations, in which the Commanding Officer especially had complete authority, which was not open to question by their subordinates.[368]

Senior leaders of the RAN in that period could accordingly be expected to insist on compliance and obedience, but in a changing environment where greater consultation was necessary to find answers to complex problems, the self-defeating result as Rear Admiral Oscar Hughes remarks, was one of stultifying the contribution of junior members of the RAN who might eventually become its senior leaders.[369] Hughes was an Aeronautical Engineering Officer who became the project director for the Replacement Aircraft Carrier (*Melbourne* replacement) and later Director of the project for acquisition of the Collins class submarines.[370] He considers one of the most important periods in his professional development was attending a civilian university, where he was exposed to issues and experiences which broadened his views by not being in an environment solely concentrated on the Navy.[371] Hughes highlighted the conservative way in which naval officers were trained in their formative years and notes "…we didn't think outside the box and I think it all goes back to the type of training we gave our people and the 'yes sir' nature that originated at the Chief Cadet Captain level at the RANC."[372] Officers were expected to maintain the status quo and he remarks "…we were brought up in

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366 Geoffrey Bolton, ed., *The Oxford History of Australia - the Middle Way*, Vol. 5 (1942-1988) Melbourne: Oxford University Press, 1986,

367 Interview with Rear Admiral Oscar Hughes, 26 March 2012. Page 23

368 Sears refers to a study by historian Stephen Roskill which emphasised the training of RN officers in conformity and obedience to orders and discouraged originality and initiative. Roskill notes that more gold braid was equated with wisdom. See: Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, page 130

369 For an examination of the behaviour of an earlier generation of RN admirals and their styles of leadership, with an assessment of their attributes see: Andrew Gordon, *The Rules of the Game : Jutland and British Naval Command*, 708) Pages 562-601

370 See: Peter Yule and Derek Woolner, *The Collins Class Submarine Story: Steel, Spies and Spin* Port Melbourne, Vic.: Cambridge University Press, 2008 Pages 128-129

371 Interview with Rear Admiral Oscar Hughes. Page 2

372 ibid page 21. RANC is an abbreviation for the Royal Australian Naval College.

the Navy, that to challenge the Chief of Navy or the Deputy Chief of Navy, or to have an argument about something was not seen to be helpful to your career…"[373]

A former Commanding Officer of RANC, when it was located at *Cerberus,* described it as being "…modelled somewhere between a British Great Public School and the penal settlement at Port Arthur."[374] Griffiths remarks about his entry to RANC before WWII that it was "…tough discipline and as a 13 year old, it was a considerable culture shock from wherever you came."[375] In a short history of the RANC and in remarks consistent with these thoughts, Commodore Adrian Cummins was quoted as saying that the College trained naval officers to be "…reliable, well trained, stubborn and dull."[376] They were attributes relevant to an organisation that had no inclination to exploit advanced methods and technologies, or to be concerned about its future, but not to a Navy in a country which expected high professional standards, unflinching self-criticism and a determination to excel as normal characteristics of its behaviour.[377]

At that time, the training of RAN officers took place in a different cultural environment from that of sailors who, for the most part, were trained in Australia with some attending RN courses, unlike its officers who were largely trained using RN methods and served for extended periods in the RN. Spurling remarks that the RAN's adoption of British culture as embodied by its officers inhibited more egalitarian Australian relationships being formed with sailors, which in turn inhibited its acquisition of an Australian character.[378] Vice Admiral Leach remarks that when on exchange with the RN as a Lieutenant he had found his Australian approach, one in which discipline was expected but sailors were treated with respect and friendliness, made for

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373 ibid page 23

374 "CDRE Stoker's 39 Year RAN Career," *Royal Australian Navy News,* 24 April 1992, Vol35 No7, Page 4

375 Interview with Rear Admiral Guy Griffiths. Page 7

376 I. J. Cunningham, *Work Hard Play Hard, the Royal Australian Naval College 1913-1988* Canberra: AGPS Press, 1988 page 102.

377 For a summary of how the senior leadership of the ADF viewed the Australian cultural aspects of its profession as the DDGs left service see: Department of Defence (Australia), *The Australian Approach to Warfare* Canberra: Department of Defence, 2002, pages 15-16

378 Kathryn Spurling, *"Life in the Lower Deck of the Royal Australian Navy 1911-1952"* (PhD Thesis), UNSW Canberra, page 394

a better working relationship than one more reliant upon an authoritarian manner, which he felt was then the accepted RN style.[379]

Rear Admiral George, a member of the Australian Naval Board, noted in his Haul Down report of 1967 that: "It was not until World War II that the RAN really began to grow up – a process which has taken far longer than anyone of us would have believed – for it still has a long way to go to reach the truly Australian character of the Australian Army and RAAF."[380] The RAN senior leadership's concentration on professional matters was matched by an attitude that the needs of the service were always prioritised over those of its members. An inflexible and narrow application of that philosophy raises the question as to what degree the needs of the service were self-limiting in terms of gaining the best from its human capital. The RAN was an instrument of Australian power, designed to use lethal force (if necessary). Although there can be intermittent occasions requiring such application of force, there can also be extended periods of more mundane activity. To achieve its purposes in an enduring manner, the Navy must constantly renew both its materiel and human elements. Whilst the physical aspects of naval warfare and its tools were largely understood by the Navy, the post-WWII cultural change taking place in Australian society and its human implications for the RAN seem to have gone largely unnoticed. It could be said that it took the Navy's leadership an extended period to understand that the culture of the Navy should align more closely with that of its countrymen so as to ensure deep-rooted support for the institution on the part of the Australian people.

Frame has characterised the attitudes of RAN officers at the time as akin to those of the British middle-class, which reflected "…a loyalty to the Establishment and to the status quo; a genuine dislike of creating a fuss; and instinctive reserve and highly developed sense of privacy…"[381] Despite the efforts of Harrington and McNicoll, altering these characteristics could only be

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379 Interview with Vice Admiral David Leach. Page 7. Notwithstanding the approach by Leach, Sears highlights that trainees at RANC had been encouraged to consider their sailors in a patronising manner. See: Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, page 307. Spurling has noted this was socially alien to Australian sailors. See: Kathryn Spurling, *"Life in the Lower Deck of the Royal Australian Navy 1911-1952"* (PhD Thesis), UNSW Canberra, pages 395-396

380 Jeffrey Grey, *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972* St. Leonards, N.S.W: Allen & Unwin in association with the Australian War Memorial, 1998 page 320

381 T. R. Frame, *Where Fate Calls : The HMAS Voyager Tragedy* page 4

done slowly and Pfennigwerth notes "…It was a very difficult time…where the last of the old and bold were finding their way up through the top of the pyramid, and the new groupings were just forming…at…Captain level."[382] Commodore Holmes could later reflect that the RAN had made important strides, and quite quickly.[383] Others had a different perspective. Commander Mummery remarks that he didn't see "…the DDG as being a major shake-up in the RAN culture…I think we probably would have developed anyway."[384] Commander Anderson also believes the DDGs "…accelerated what would have happened anyway..."[385] and considers that by the early 1960s the RAN had started to see itself as more independent, and the DDGs contributed to the changes that took place thereafter.[386]

The evidence shows that prior to acquisition of the DDGs the RAN was not an organisation that culturally looked to the future, and its inherent resistance to change meant that opportunities presented through their introduction were unlikely to be exploited. As more contemporary management theorists such as Peter Drucker[387] might suggest, the RAN from the early-1960s, until at least the late 1970s, could not be regarded as a 'learning organisation' in that it did not deliberately examine new circumstances for potential organisational benefit. In mitigation, there was no shortage of challenges the RAN leadership had to meet following the Korean War. These included relocating the RAN Headquarters from Melbourne to Canberra, acquisition of the DDGs, introduction of a submarine service, the fight to retain *Melbourne* and regenerate the Fleet Air Arm, the loss of *Voyager* and related Royal Commissions, combat operations in Vietnam, and fundamental changes to the Department of Defence. [388]

Criticisms of the culture, education and training of RAN officers voiced by some officers were in fact shared by elements of the senior leadership of the Navy. In his Haul Down report of 1965, CNS Harrington remarked that the RAN failed to encourage independent thought and commented on an environment "… where the few who have original and productive professional thought are overwhelmed and discouraged by the many who cannot originate

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382 Interview with Captain Ian Pfennigwerth. Page 56
383 Interview with Commodore Ian Holmes. Page 36
384 Interview with Commander Robert Mummery, 4 July 2012. Page 38
385 Interview with Commander Antony Anderson. Page 42
386 ibid
387 Peter Drucker, *Managing in a Time of Great Change* Oxford: Butterworth-Heinemann Ltd, 1995
388 For a summary of RAN history addressing the period 1955 to 1983 see: David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, 336) pages 181-237

thought and yet who have the ability to introduce administrative delays."[389] In responding to the Minister for the Navy (Mr Chaney) on Harrington's remarks, the incoming CNS, McNicoll, advised that tertiary education was intended to be introduced for all naval officers, and that the officers' performance reporting system would be reviewed with the intention of removing the equality of social attributes with leadership qualities for assessment purposes.[390] McNicoll also expressed his view that while the RAN had benefited much from its RN support, it was "…not altogether good for young Australians, while still in the formative stage, to spend as long in England. They may lose the Australian touch."[391] McNicoll seems to have understood that Australians expected their Navy to match their social norms, meaning that it should have the characteristics of equality and lack of social distinction, with an appreciation of and recognition for those who succeeded through professionalism, hard work, discipline and high ethical standards.[392] This suggests that McNicoll, and possibly other members of the Naval Board, were by then advocates of merit, as opposed to manners and conformity, as the key future criterion by which officers were assessed for advancement.[393]

The DDGs entered RAN service at the same time as this nascent sense of cultural change was forming, and as the Navy was again being committed to combat operations. By virtue of their uniqueness, the ships increased the incentive for multifaceted change across the RAN. As we have seen, David Campbell and others have noted the high standards of professional excellence inculcated in officers of the DDGs. In practice however, much of their success as officers in DDGs can be attributed to results achieved through forming successful working relationships with their sailors, who themselves had to be expert in their use and maintenance

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389 Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral Sir W H Harrington 1965*, Vol. NAA: A1209, 1967/7451 (Canberra: National Archives of Australia) page 7

390 Commonwealth of Australia, *Personal Papers of Prime Minister Menzies: Haul Down Report by Vice Admiral Sir Hastings Harrington [Includes Comments by Alan McNicoll and Secretary, Department of the Navy, and Correspondence from Hon F C Chaney Re Skyhawk Aircraft]*, Vol. NAA: M2576, 51 (Canberra: National Archives of Australia) Undated on file but estimated as April 1965, page 8

391 ibid (CNS McNicoll to Minister Chaney responding to Harrington's Haul Down Report.) Page 11

392 Being 'uniquely Australian' is a condition that remains open to discussion of its definition but these elements are typically present in public statements such as made by the then Australian Shadow Minister for Multicultural Affairs, Senator Jim Short in 1995. See: https://www.dss.gov.au/our-responsibilities/settlement-and-multicultural-affairs/programs-policy/a-multicultural-australia/programs-and-publications/1995-global-cultural-diversity-conference-proceedings-sydney/political-aspects-of-diversity/multiculturalism-and-australian

393 Sears has noted that RAN officers who wanted change were rarely promoted. See: Jason Sears, *Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50*, page 415

of USN equipment and competent leaders themselves. We can assume that how Leach had related to his RN sailors was his style with RAN sailors when in command of *Perth* which, as suggested by Spurling, would have been the preferred way in which Australian sailors would wish to be treated by an Australian officer. In terms of how Weapons Electrical officers and their sailors related to each other, Commodore Holmes notes that the arrangement adopted in the DDGs "…required us in fact to manage a system and to trust our troops…It worked magnificently."[394] The uniquely non-RN[395] working environment of the DDGs and their intensive operational roles both permitted, and required, formation of a productive interrelationship between officers and sailors in their common pursuit of professional excellence: one that necessarily involved mutual trust.

None of the personal testimonies gathered in this research hint at such cultural differences between officers and sailors found by Sears[396] and Spurling.[397] The remarks of Leach and Holmes, and the implications of others, suggest rather that any such separation, present until the 1950s, was less evident by the mid-1960s in so far as those serving in DDGs were concerned. Overall however, the working environment in the DDGs, initially in Vietnam but also subsequently, can be inferred to have contributed positively, if somewhat intangibly, to the progressive Australianisation of the RAN culture, both of its officers and sailors.[398]

During a time of considerable challenges for its leadership, the RAN was handicapped by having only a small Naval Staff[399] which advised CNS on all matters, but which for a prolonged period lacked the breadth and depth of experience comparable to those of the RN and USN.[400] The Navy was also a relatively large organisation and one that was instinctively conservative,

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394 Interview with Commodore Ian Holmes. Page 19

395 DDGs operating in Vietnam were only crewed with RAN officers, albeit many of which had trained with the RN. The ships had an all-Australian crew.

396 Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, page 422

397 Kathryn Spurling, *"Life in the Lower Deck of the Royal Australian Navy 1911-1952"* (PhD Thesis), UNSW Canberra, pages 395-396

398 Sears notes that post-WWII the Royal Canadian Navy took a conscious decision to moderate the effect of its RN heritage in the interests of developing itself for the wider benefit of Canada and Canadians. See: Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, page 6

399 For an indication of staff positions at Navy Office in 1960 See: Sea Power Centre Australia, *The Navy List January 1960* Canberra: Department of Defence (Navy), 1960 Pages 113-127

400 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, 336) page 187

and had to accommodate change while not failing in its broad responsibility for ensuring Australia's security. Recognising a potential catalyst such as the DDGs was unlikely given the day to day responsibilities for leading the Navy and the institutional cultural environment of the time. The DDGs and all they potentially represented therefore became one of many challenges to be managed by the RAN, and its leadership had little choice but to rely on those associated with the DDGs to make them work. This was the avenue through which change would progressively advance. In this context, Kennedy's concept of 'history from the middle' at the grand-strategic macro-level also has application at the institutional micro-level, where the DDGs represented a nascent catalyst for cultural change.

Introduction of the DDGs brought with them the requirement to engage with the USN and its different practices and to approach problems from an independently national and practical point of view. Their working environment contributed to sailors being given more respect through recognition of their professionalism in a cooperative relationship with their officers. Thus, without the presence of the DDGs, it is possible that the RAN would have persisted with its outdated style of senior leadership for a much longer period.

As we have seen, in the year 2000, for the first time, the RAN promulgated its own maritime doctrine.[401] Although this represented a very important milestone in the RAN's development of independent thinking and stemmed from its increased confidence in its own abilities, this also signified just as importantly a watershed in its cultural evolution. In particular the doctrine noted how "…emphasis on the absolute dependence of our capability upon the people who serve and support the RAN is one of the most important elements of the text."[402] Similarly it encouraged innovation by all of the RAN's members so as to exploit technical and human capabilities to achieve greater professional excellence.[403] Thus, in the 35 year period after the introduction of the DDGs, when such attitudes were discouraged, they were now being actively encouraged as essential to the future of the Navy. This suggests that the culture of the RAN had markedly changed and, as we have seen, the DDGs were at least a partial cause of that change. Through the psychology of individuals in their interaction with physical ships, the DDGs demonstrably impacted on the culture of the RAN, helping to shift it away from its

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401 Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2000*, 1st ed. Canberra, ACT: Defence Publishing Service, 2000

402 ibid page v

403 ibid pages 126-127

British heritage and creating new ways of thinking about itself, including about how its people were part of its future. This, in combination with the further evolution of its social attitudes, positioned the RAN as a more distinctly Australian Navy.

Conclusions – The Impact of Operating the DDGs

This chapter has examined the impact on the RAN of operating the DDGs through the experiences, opinions and perceptions of individuals who had, in their different roles across the Navy and elsewhere, responsibility for making Australia's acquisition of the DDGs an operational success. They included Captain (later Rear Admiral) Guy Griffiths, the first Commanding Officer of *Hobart*, the second DDG. Griffiths was responsible for bringing it into naval service and commanded it on Australia's first DDG combat mission to Vietnam where it became a unit of the USN 7th Fleet. Other officers had responsibilities ranging across all of the RAN's primary areas of endeavour: operations, technical and logistical support. Quite a number of them rose to high rank and made long use of their DDG experiences. They had served in an American warship in an Australian Navy that had modelled itself closely on the Royal Navy. They had to adapt traditional arrangements or create new ones appropriate to how the DDGs had to be operated, maintained, and supported so they could fight and win. They had cause to observe closely how the DDGs became the primary surface combatant capability of the Navy. Their individual and collective contributions were essential in successfully implementing decisions taken by the Prime Minister and CNS, and in so doing they promoted changes which affected all of the RAN.

From 1965 to 2001 when the DDGs were in service, there was considerable geostrategic, political and social change affecting Australia as a nation. Such change could be expected to have been reflected in different ways in the lives of people joining and serving in the RAN, thereby progressively affecting its culture. Testimonies of those who participated attest that they regarded introduction of the DDGs as an essentially positive development for the RAN. In service, the ships became the benchmark for professional standards of performance as well as introducing the RAN to new ways of doing business. In regard to wider cultural changes which emerged in the RAN and to which the DDGs had contributed, a few people felt that some were likely to have come about regardless. Notwithstanding, the evidence shows that operation of the DDGs contributed significantly to the growth of the Navy's own confidence and ability to adapt to its changing environment far more quickly than would otherwise have been the case.

Major changes were determined and implemented by the senior leaders of the RAN and, as will be seen in Chapter 6, for an extended period many of them came from a DDG background.

We cannot know exactly how the RAN might have evolved had the RN County class been acquired instead of the Adams class, but several inferences can however be drawn. Politically, the Government's policy of forging a closer naval relationship with its most important ally would probably not have been achieved as effectively and the shift in the external orientation of the RAN from the RN to the USN would not have been possible to the same degree. Had the RAN continued to be of a physically as well as a culturally RN character, its level of interoperability with the USN would have been much inferior, and its exposure to modern naval concepts as used by the USN would similarly have been limited. Senior officers of the RAN would almost certainly have prolonged their predominantly British culture which, by the mid-1950s and possibly before, had become significantly divergent from that of Australia's changing society. Australia's youth may not have been attracted to a career in a societal environment much different to that from which they had become accustomed. In terms of their value to the RAN and Australia, the influence of DDG operations in Vietnam was considerable and multidimensional, and the experience built the RAN's confidence in a warlike environment alongside its major ally where the RN was not present. These operations also created a repository of expertise in RAN personnel and provided a basis for further evolution of the RAN in building on that operational experience.

Operationally, the Adams class were highly regarded. The remarks of Vice Admiral Leach and Rear Admiral Griffiths particularly, as well as others, reflect considerable pride in their ships and crews, and especially how highly they rated them as combatant vessels. Vice Admiral Walls regarded the DDGs as the professional benchmark for the Fleet and measured other personnel and units against that standard. He and others considered that the DDGs gave impetus to the RAN's shift away from the RN and its becoming more independent in thought and behaviour. Adoption of modern USN sensors and weapons was regarded as a positive step with the introduction of automatic medium calibre guns, height finding radars, the medium range surface to air missile system, and eventually the digital combat system. The operational benefits of a USN research and development program that focussed on enhancing the technical and therefore the operational performance of the DDGs were acknowledged as

something the RAN could not have replicated. The rapid rate of technical change adopted by the USN was something the RAN had not previously experienced.

Technically, the DDGs were the most advanced surface combatants ever acquired by the RAN, and those who operated, maintained and supported them were enthusiastic about their performance and reliability. The USN approach to engineering was different from that of the RN, with which the RAN was much more familiar. The USN philosophy of designing ships for crews which were not, in general terms, as highly trained as those of the RAN with its RN training philosophy, meant that officers and sailors of the RAN had from the outset the potential ability to achieve a high standard of technical performance. With its progressive shift away from the RN heralded by arrival of the DDGs however, the RAN had no choice but to become more self-reliant in an engineering sense, but this was not fully appreciated until technical failures wrought severe operational penalties and kept ships out of service. Important technical understanding, which included gaining a level of appreciation of the true depth of national capability needed to support the Navy, was not fully possessed by those making significant organisational decisions. Logistical support problems that emerged through operating the DDGs were initially shielded from exposure by their deployments to Vietnam, where the ships integrated into the USN support system. In rectifying this situation and overcoming institutional resistance in the process, the lessons learned by RAN Supply practitioners contributed to a wholesale change in the way that logistical support for the RAN was conducted, so the Navy as a whole could operate more effectively.

Some individuals retain a perception that the opportunities inherent in the introduction of the DDGs were not exploited to the fullest extent, and that this was due in part to a lack of vision at the highest leadership levels of the RAN. The organisational immaturity of the RAN at the time however, and its generally conservative culture at senior levels, suggest that such vision would have been highly unlikely to emerge.

Introduction of the DDGs was a key moment following which the RAN transitioned more visibly towards becoming distinctly Australian in character as well as name, and those associated with the DDGs were participants in that evolution. Those who served in the ships regarded their experience as professionally productive and rewarding, and more likely to have been so than if they had served in other ships of the RAN, which they considered less operationally and technically advanced. The culture encouraged in the ships was one wherein professional

growth was important, and through that development individuals became more professionally capable. Importantly, the working arrangements in the ships required the building of a stronger cultural bridge between Australian naval officers and sailors, a missing link in the human dimension of the RAN delayed in its advent by its long relationship with the RN. The impression gained is one of naval people believing that they made an important contribution to the RAN, thereby having a positive impact. They constituted a group who came to regard themselves as special and who, in due course, influenced the future of the Navy. In that sense there was an *esprit de corps* which contributed to their attitude, strongly held, that high performance was the expected and normal state of affairs. This state of mind was one which many carried into the senior leadership levels of the Navy.

Examination of the experiences of the DDG practitioners is a case study which suggests that the model developed by Kennedy of "history from the middle" can work at the micro as well as the macro-level. In the process of implementing decisions taken by Australia's highest leaders, their DDG service had a profound impact on the culture of these practitioners. The people, as well as the DDGs themselves, thus became important catalysts in progressively changing the RAN.

Chapter 6 – Impact of the DDGs on the Senior Leadership of the RAN

> "There was a club, I think it was a sort of a first 11 feel; that you were in the forefront of the best ships, and there was great rivalry between *Perth*, *Hobart* and *Brisbane*…I think it was more a finishing school than an FFG or a DE…"[1]
>
> Vice Admiral David Leach, former Commanding Officer of HMAS *Perth* and Chief of Naval Staff.

This Chapter initially compares the promotion prospects of DDG Commanding Officers and their Heads of Departments[2] with those of others who served elsewhere. The comparison serves to highlight how officers selected for DDG service at that level were probably already in the forefront of their peer group, but also how their performance in those roles was important in terms of their future potential as more senior officers. For an extended period these former DDG senior officers collectively led and had stewardship of the Navy, and a summary of their broad responsibilities illuminates how influential they were in terms of their potential to initiate and implement whole-of-navy change.

This is followed by an examination of the careers of three selected officers, chosen on the basis of their DDG service and their presence at the beginning and during the ensuing years of transition by the RAN away from the RN. Throughout their careers they experienced and participated in the substantial change which took place in the RAN from the mid-1960s to the late 1990s, and at star rank they all became responsible for shaping its future. They represent a case study of how DDG experienced officers adapted to their environment and applied the experience gained in formative professional years in the later conduct of their more senior responsibilities.

This chapter demonstrates how the DDGs were important catalysts for the development of the RAN's future senior officers, officers who contributed significantly to the progressive emergence of a more independent and self-confident Australian Navy.

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1 Interview with Vice Admiral David Leach, 14 March 2012. Page 26

2 In a warship, a Head of Department was the officer accountable to its Commanding Officer for the full range of relevant responsibilities. In conventional management terminology they were the senior executives, but this is an imperfect analogy in that the operation of a warship was not the same as that of a business with either a commercial or social orientation.

Introduction

As the DDGs were being introduced into service in 1965, the RAN was engaged in British Commonwealth operations in defending Singapore and Malaysia against Indonesian aggression (Confrontation).[3] Vietnam had not yet become an RAN theatre of combat operations but Navy manpower was already stretched.[4] Those who were selected as members of the commissioning crews of the DDGs were therefore chosen from the broader pool of officers at a time when the RAN's manpower was being carefully apportioned to meet its responsibilities. When acquired, the DDGs were to become the RAN's most powerful destroyers, and it could be expected that selection of their crews would have received careful consideration. Their officers were posted on the expectation that their current level of experience and training, supplemented as necessary, would adequately equip them for the task.[5] The RAN still flew the ensign of the RN and largely followed its customs; its ships, higher level administration and command arrangements all had obvious British origins. The admirals of Australia's Naval Board had all been trained in Britain and had friendly senior contemporaries in the RN, but in Australia they were charged with implementing their Government's policy of realigning the RAN with the USN via acquisition of the DDGs.

As we have seen, the DDGs were initially an anomaly in the RAN with its RN heritage and RN-origin ships, and their involvement in Vietnam operations from 1967 to 1972 brought the added effect of segregating them from the remainder of the RAN and preventing their deeper integration into the Service. Further, the experience of commissioning the DDGs and of their operations in Vietnam gave some members of the RAN an intensive exposure to USN methods not encountered since the Pacific campaigns of WWII. The number of officers who had served in DDGs grew progressively as the service lives of the ships also progressed, and some officers of all Branches were posted to the ships on multiple occasions to make best use of their experience, which in turn further contributed to their professional development.

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3 Alastair Cooper. "1955-1972: The Era of Forward Defence." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001. 181-209. Pages 197-201

4 ibid pages 194-197

5 Henry Burrell et al., *Mermaids do Exist* South Melbourne: Macmillan, 1986, page 256

There were only three DDGs in the class. By 1980 they had become one third of the RAN's order of battle of major surface combatants,[6] but from 1980 onwards they were on average only one quarter of the RAN's major surface combatant order of battle until *Perth* decommissioned in 1999.[7] Officers selected for star rank were chosen from the entire population of eligible officers in the RAN. As will be shown, a comparison of star ranked officers who had had senior DDG service experience with all officers selected demonstrates that, for a considerable period of time, the DDGs were a disproportionately common career point for those reaching star rank and hence the RAN's senior leadership. From 1955 to 1982, with one exception, the officers who commanded the RAN had commanded an aircraft carrier.[8] From 1982 to 2008 – a similar period of time, also with one exception, the RAN was commanded by an officer who had commanded a DDG.[9] The DDGs were therefore significant in terms of the professional development of the RAN's most senior officers during this era.

Star Rank Promotion Prospects from Service in a DDG

RAN Branches and Professional Experience

Star ranked officers are the leaders of the Navy, and as an indication of professional experience required at star ranks, officers promoted to commodore could, during this period, typically expect to have had a minimum of 25 years' service to that point. Their service career would be approximately 30 years on reaching rear admiral, and approximately 30 to 35 years on reaching the rank of vice admiral.[10] Nick Jans notes that to be considered for promotion to star rank required officers not only to have consistently performed well over their careers at the time of their selection, but also to give a strong indication that they possessed the characteristics needed for strategic leadership.[11] Such characteristics would ideally include a blend of operational service, competence in difficult circumstances, leadership in a range of environments, and communications skills.[12] Jans also highlights the importance of

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6 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, Appendix 1. Also see Appendix A to the thesis for a summary of change to the RAN's major combatants 1961-2002.

7 ibid. Appendix 1

8 David Stevens, ed., *The Australian Centenary History of Defence: The Royal Australian Navy*, Vol. III Melbourne: Oxford University Press, 2001, pages 311-312

9 ibid

10 ibid

11 Nick Jans et al., *The Chiefs - A Study of Strategic Leadership* Canberra: Centre for Defence Leadership and Ethics, Australian Defence College, 2013, page 119

12 ibid

professional military education which was also strongly supported by the Chief of the Defence Force, who emphasised the difference between the personal attributes and skills needed at the strategic level, as against those necessary for tactical operations and combat.[13]

Unsurprisingly this required choices between eligible officers, with demonstrated superior performance and assessed potential relative to their peer group as essential criteria. As the Chief of Navy noted in 2011, as the character of the ADF as an effective tri-service organisation evolved, RAN leaders would also be required to be increasingly aware of how the Navy made an optimal contribution to the Joint Service environment.[14] The general inference is that the characteristics of star ranked naval officers would ideally be that they were widely experienced, intelligent, multi-skilled and able to manage their internal and external pressures, but nonetheless adroit at adapting their Service or other organisation to meet the demands of both the present and the future.

In the epigraph to this chapter, Admiral Leach contends that the DDGs acted as a 'finishing school', more so than other classes of surface combatants of the RAN, sharing the belief also expressed by Rear Admiral Campbell that the cohort of senior officers serving in DDGs comprised the RAN's First XI.[15] As a former CNS responsible for selecting the Navy's Commanding Officers, Leach is suggesting that he, and probably others in his position, regarded the ships more highly than others as providing officers with superior experiential opportunities. In other words, from the time of their acquisition, and particularly after the departure of *Melbourne* in 1982, DDGs represented the culmination of a seaman officers' seagoing career as far as ship command was concerned. It is reasonable to infer that those given the task of nominating the Heads of Departments of DDGs adopted a similar attitude for similar reasons. Hence, a comparison of the numbers of DDG Qualified officers promoted to star rank compared with those who were not so qualified could be expected to find that the DDG officers comprised a greater proportion of that cohort, thereby indicating that their promotion prospects were enhanced by that service.

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13 ibid. Forward by Chief of the Defence Force

14 Russell Crane, "The Royal Australian Navy's Force 2030: An Asia-Pacific Strategy," *The RUSI Journal,* 156, 2, 68-73

15 Interview with Rear Admiral David Campbell, 28 June 2012. Page 11

In this chapter officers who were either a Commanding Officer or Head of a Department[16] of a DDG and reached star rank are considered in the context of all officers selected for star rank promotion, regardless of where they served. Although the sample of officers compared is acknowledged as being limited in size, and representing only a portion of the total officer population, this comparative exercise can be seen as a valid means of demonstrating that service in a DDG did, for the most part, improve an officer's prospects of reaching star rank as against service elsewhere.[17] In comparing the number of officers who were thus DDG Qualified as against those who were not, the baseline date for the promotion to each respective rank, and for numerical comparison subsequently, is taken as the earliest date of seniority at which a DDG Qualified officer reached that rank. For example, Commodore Guy Griffiths who was previously the Commanding Officer of *Hobart* became the first DDG Qualified officer promoted to the rank of commodore with a seniority of 29 October 1971, which therefore forms the baseline date for considering the total number of Seaman Branch commodores promoted on or after that date.

The following analysis examines the promotion prospects to star rank of officers from each of the three main Branches of the RAN. As applicable, information is also provided for numbers of officers in sub-specialist components of each Branch, with associated Tables and Figures shown in Appendix E. The upward progression of the careers of numerous officers who had occupied senior positions in DDGs was not confined to a single Branch of the RAN, and it will be shown that these Branches became progressively populated at their highest levels and led by officers whose common career sea-service was at a senior level in a DDG.

Promotion Prospects of Seaman Officers – Commodore to Vice Admiral

The rank of commodore was adopted on a permanent basis by the RAN in September 1974, and three DDG Qualified officers were promoted at the same time.[18] As noted, Captain Guy Griffiths had commissioned *Hobart* as its Commanding Officer and on promotion to

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16 An explanation of the limitations of examination of the *Navy List* series so far as Executive Officers were concerned is contained in Chapter 1.

17 Details of the careers of officers have been drawn from the RAN *Navy List* series from 1960 to 2001.

18 "Promoted to Commodore," *Royal Australian Navy News,* 16 August 1974, Vol17 No18, Page 3

commodore his seniority at that rank was determined to be 29 October 1971,[19] which made him senior to his peers, therefore making Griffiths the first DDG Qualified seaman officer to reach commodore.[20] The baseline date for the promotion of all seaman officers to commodore is therefore determined to be 29 October 1971, and for comparative purposes the seaman officers promoted to commodore are all those with a seniority between 29 October 1971 and 31 December 2001.

During that period of examination, the total number of seaman officers promoted to commodore was 116, of whom 60 were DDG Qualified, or 51.7%[21] of the group (Table E-1 provides details by sub-specialisation). At this point, service in a DDG could be regarded as having only marginal benefit as far as promotion prospects were concerned. Included in the 56 non-DDG Qualified officers, however, were 14 aircrew officers who were also members of the Seaman Branch. Some aircrew were qualified to be Executive or Commanding Officers of a major warship by virtue of also being qualified to hold Sea Command, which issue is examined later in the chapter. Aircrew officers (12 Pilots and two Observers) represent 25% of the non-DDG Qualified cohort, but one aircrew officer who had commanded *Hobart* was promoted to commodore and is included in the DDG figure of 60. As will be seen, aircrew had a much lower likelihood of further promotion although that circumstance might have been quite different if the demise of the carrier *Melbourne* and RAN fixed wing aviation had not occurred.

Figure E-1 shows that the apparent career benefit of service in a DDG, referred to here as 'the DDG effect', for seaman commodores had started to wane by 1995 and was moving toward its demise after 1998. The transition is attributable to the changing mix of the surface combatants in the RAN[22] and a broader range of captain's postings becoming present, which had the overall effect of reducing the importance of the DDGs as the source of future commodores. From Table E-1 it can be seen that the largest single group of promotions to commodore within the Seaman Branch was of those who sub-specialised as Navigating

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19 A consequence of adopting commodore as a permanent rank was to cause the backdating of seniority for some captains who were selected for promotion to commodore in that batch. Griffiths was one of those officers so affected, and also became the first DDG Qualified officer of any Branch to reach that rank.

20 Sea Power Centre Australia, *The Navy List September 1974* Canberra: Department of Defence (Navy), 1974, page 39

21 Where appropriate, calculations are rounded to one decimal place.

22 Appendix A summarises the changing major combatant mix of the RAN for the period of this study.

Officers. This group included Principal Warfare Officers who also sub-specialised as Navigating Officers, and who collectively are referred to as Navigators. There were 23 Navigators (17 DDG Qualified and six non-DDG Qualified) promoted to the rank of commodore with seniorities between 1971[23] and 2001, representing 19.8% of a total of 116 seaman officers so promoted.

Figure E-2 shows the annual promotion trend for Navigators who were DDG Qualified versus those who were not, and the substantial advantage which service in a DDG apparently bestowed on that group. The number of Navigators promoted to commodore relative to the whole group implies a slight overall promotion advantage was present for that sub-specialisation, but an examination of the reasons for that circumstance is outside the scope of this research.

As we have seen, the RN Long Course officer training system was replaced by the Principal Warfare Officer (PWO) scheme in 1972 and was adopted by the RAN. As an apparent consequence of the increasing number of PWO qualified officers replacing their Long Course equivalent qualified officers, from 1990 to 2001 the balance between seaman officer sub-specialisations selected for promotion progressively became more even, and is summarised in Table E-4.

The first DDG Qualified seaman officer selected for promotion to rear admiral was Guy Griffiths, who was promoted with a seniority of 30 June 1976.[24] The baseline date for the promotion of all seaman officers to rear admiral for comparative purposes is therefore determined to be 30 June 1976, and the officers promoted to rear admiral for purposes of this examination are all those with seniority between 30 June 1976 and 31 December 2001.

The effect of being DDG Qualified in this cohort is much more obvious than in the commodore group. During this period, the total number of seaman officers promoted to rear admiral was 39, of whom 28 were DDG Qualified, or 71.8% of the group. Overall, service in a DDG could be said to have had a significantly positive effect at this level as far as promotion was concerned and Figure E-3 shows the Seaman Branch promotion trend to rear admiral between 1976 and

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23 The first Navigating Officer promoted to the substantive rank of Commodore was Peter Doyle with a seniority of March 1973. Sea Power Centre Australia, *The Navy List September 1974*, page 6. Captain Doyle was the second Commanding Officer of *Perth* having relieved Captain Cartwright, and then commanded *Perth* on its first deployment to Vietnam.

24 Sea Power Centre Australia, *The Navy List December 1977* Canberra: Department of Defence (Navy), 1977. Page 14

2001. As perhaps expected, the slightly larger proportion of officers consisted of navigating sub-specialists, comprising seven of the 28 (25%) DDG Qualified rear admirals promoted. Table E-5 summarises promotion of seaman officers to rear admiral by their sub-specialisation.

The first DDG Qualified seaman officer selected for promotion to vice admiral was rear admiral David Leach, who had commanded *Perth* during its second Vietnam deployment and promoted with a seniority of 21 April 1982.[25] The baseline date for the promotion of officers to vice admiral is therefore determined to be 21 April 1982, and the officers promoted to vice admiral for purposes of this examination are those with seniority through to 31 December 2001. Leach also became the first DDG Qualified officer to be appointed in command of the RAN as Chief of Naval Staff on 21 April 1982.[26]

During the period 1982 to 2001, there were 10 seaman officers promoted to the rank of vice admiral, of whom eight, or 80%, were DDG Qualified.[27] As with promotion to rear admiral, the disparity of those with DDG experience as against those without is notable. Figure E-4 shows the Seaman Branch promotions to vice admiral from 1982 to 2001. Four of the 10 vice admirals were navigation sub-specialists, and the composition of this group by sub-specialisation is shown in Table E-6.

Promotion Prospects of Engineer Officers – Commodore to Rear Admiral

The first DDG Qualified officer of the Engineering Branch to be promoted to commodore was Captain William (Bill) Rourke, with a seniority of 17 February 1976.[28] Rourke had been a member of the DDG project staff based in the Australian Embassy in Washington DC, and became commissioning MEO of *Brisbane*.[29] During the period 1976 to 2001, there were 40 officers of the entire Engineering Branch promoted to commodore, of whom 18 (45%) were DDG Qualified. In overall terms, for engineering officers, service in a DDG does not appear to have given them an advantage in promotion to commodore. Figure E-5 shows the number of Engineering Branch promotions to commodore per year for this period.

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25 Sea Power Centre Australia, *The Navy List December 1982* Canberra: Department of Defence (Navy), 1982. Page 27

26 Sea Power Centre Australia, *The Navy List December 1982*, page 27

27 The remaining two officers were Vice Admiral Rodney Taylor and Vice Admiral Christopher Barrie, both of whom had been commissioning crew members of *Brisbane*. Barrie was subsequently promoted to Admiral and became Chief of the Defence Force. See: Sea Power Centre Australia, *The Navy List August 1999* Canberra: Department of Defence (Navy), 1999. Page B-1

28 Sea Power Centre Australia, *The Navy List December 1977*, page 56

29 Sea Power Centre Australia, *The Navy List September 1968,* page 147

When the membership of each Engineering sub-branch is examined separately however, service in a DDG apparently had most effect on the careers of officers of the WEEO cohort. As shown in Table E-7, there were 13 officers in this group, including the WEEO submariner who was also DDG Qualified, representing 65% of the 20 combined DDG and non-DDG Qualified WEEO officers. The size of this cohort could be expected to have implications for the proportion of engineering officers subsequently promoted to rear admiral.

In contrast, the five DDG Qualified MEO represented 29.4% of the overall MEO cohort and it could be inferred that service in a DDG for that sub-branch was not in itself career enhancing. From about 1985, sailors who had been promoted to officer became the primary source of MEOs for the DDGs,[30] which could explain why DDG MEOs were not represented at star rank in the same proportion as their WEEO counterparts. It may have been that they had become too specialised in keeping the DDGs operational, and in so doing had not had the opportunity to develop the breadth of expertise required at higher rank.

The first DDG Qualified engineering officer selected for promotion to rear admiral was again William Rourke, promoted with a seniority of 26 March 1979.[31] The baseline date for the promotion of all Engineering Branch officers to rear admiral is therefore 26 March 1979, with the relevant period for this study falling between March 1979 and December 2001. In this period, the total number of engineering officers promoted to rear admiral was 11, of whom six were DDG Qualified, or 54.5% of the group. Overall, service in a DDG at this level could be said to have had a marginal effect as far as promotion across the entire Engineering Branch was concerned. The Branch as a whole was large and diverse, but because of the RAN's Branch structure and the higher level leadership arrangements of the RAN as shown in Figure 4 (on page 303), there was typically only one or, infrequently, two engineering qualified rear admirals serving in the Navy. Notwithstanding, as for promotion to commodore, the effect of service in a DDG on promotion to rear admiral was most evident in the Weapons Electrical sub-branch. As shown in Table E-8, of the five WEEO promoted to rear admiral, four (80%) were DDG Qualified. For Weapons Electrical officers, their DDG service can be seen as being career enhancing.

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30 Interview with Rear Admiral Trevor Ruting, page 18

31 Sea Power Centre Australia, *The Navy List June 1979,* page 33

Promotion Prospects of Supply Officers – Commodore to Rear Admiral

The first Supply Branch DDG Qualified officer promoted to commodore was Ian Crawford, who had a seniority of 23 July 1979.[32] Crawford was the commissioning Supply Officer of *Perth* in 1965 in the rank of commander.[33] The baseline date for promotion of officers in the Supply Branch to commodore is accordingly 23 July 1979. Between 1979 and 2001, there were 16 supply officers promoted to commodore, of whom 8 (50%) were DDG Qualified. From this examination, service in a DDG does not appear to have increased their potential for promotion to one star rank.

As we have seen, the Supply Branch underwent considerable change after the DDGs were introduced, and over time the Secretariat element was removed from its title and further changes were expected to come.[34] Figure E-7 shows Supply Branch promotions to commodore over the period 1979 to 2001, and Table E-9 shows the summary of DDG and non-DDG supply officers promoted to commodore.

Ian Crawford became the first DDG Qualified officer of the Supply Branch to be promoted to rear admiral with a seniority of 27 November 1984.[35] In the period 1984 to 2001, a total of five Supply Branch officers were promoted to rear admiral, of whom four (80%) were DDG Qualified as shown in Figure E-8 and Table E-10 respectively. Service in a DDG for a supply officer could therefore be regarded as having a positive effect on their prospects for promotion to rear admiral. In practical terms, the small size of the Branch and overall leadership arrangements of the RAN meant few supply officers could aspire to reach rear admiral. Nonetheless, these officers had an influence. The testimonies of Crawford, Forrest and Campbell elsewhere in this thesis speak to the important changes brought to RAN and ADF logistical management practices through their efforts and those of other members of the Supply Branch.

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32 Sea Power Centre Australia, *The Navy List June 1983*, page 10

33 Sea Power Centre Australia, *The Navy List September 1965*, page 153

34 In a further evolution of its role and reflecting the importance of logistics, in January 2013 the Supply Branch of the RAN was re-named the Maritime Logistics Community. Grahame Falls, "Maritime Logistics Category Management," *RAN Maritime Logistics Community News,* Summer/Autumn, 2012/2013, 29 October 2013, 52. Page 10

35 Sea Power Centre Australia, *The Navy List June 1985,* page 10

Command of the RAN - Transition from the Carrier to the DDG Period

An understanding the definition of 'Command' as it was applied in the RAN helps comprehend the RAN's organisation in terms of who could aspire to hold command. It also illuminates how its application limited the careers of many officers who could not rise beyond the rank of rear admiral.

In the RAN, 'Command' was defined as "The authority exercised by all members of the Naval Forces by virtue of their respective relative ranks and seniorities over their subordinates regardless of Branch."[36] Amplifying this definition was the term 'Sea Command', which meant "The authority to exercise command of seagoing ships."[37] The RAN's regulations stipulated that Sea Command "… can be vested in officers of Flag rank holding appointment as the Chief of Naval Staff, Deputy Chief of Naval Staff and Flag Officer Commanding HMA Fleet…and officers who are borne for seaman duties."[38] The term 'borne for seaman duties' meant "…one who is qualified for seaman duties and is posted as a member of the complement[39] including one who is posted for flying duties…"[40] The award of a Full Bridge Watchkeeping Certificate was the prerequisite qualification to becoming 'borne for seaman duties' and only an officer holding 'Sea Command' could award a Bridge Watchkeeping Certificate.[41] Commanding Officers of warships were thus qualified to hold Sea Command, and because

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36 Royal Australian Navy, *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54)*. Article 0231 (a)

37 ibid article 0231 (c)

38 ibid article 0233

39 'Complement' is a term meaning the personnel required to match the required operational organisation of the ship. It is a listing of the numbers required of every type of officer and sailor of each Branch at each rank. Schemes of Complement are also used for naval personnel planning purposes.

40 Royal Australian Navy, *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54)* Canberra: Royal Australian Navy, 1976. Article 0233

41 A Full Bridge Watchkeeping Certificate was the highest level and could only be awarded by the Commanding Officer of a large ship, being a frigate or above. It qualified an officer to keep bridge watches by day and night in any ship of the RAN in all circumstances, and to be responsible for its safe operation. See: Royal Australian Navy, *Australian Navy Orders 181/67 Officers - Bridge Watchkeeping and Ocean Navigation Certificates and Certificates of Fitness for Seaman Duties. Dated 25 April 1967.* (Canberra: Sea Power Centre Australia)

their Executive Officers were the alternative Commanding Officers, they too were required to hold a Bridge Watchkeeping Certificate and be therefore similarly qualified.[42]

The import of these provisions for the higher leadership ranks of the RAN was that in practice only officers qualified to exercise Sea Command could command a ship, and therefore ultimately aspire to command the RAN.[43] Implicit in this arrangement was that the cumulative experience gained by a seaman officer over their career was an important consideration in assessing their suitability for leadership at the highest levels of the Navy[44] and for many years, as we have seen, those who commanded the RAN had usually commanded an aircraft carrier, or subsequently a DDG. Although not in contention for command of the Navy at the rank of vice admiral, the breadth of an officers' experience in other Branches was an equally important factor in assessing their suitability for the most senior roles for which they were eligible. Axiomatically, officers who were not members of the Seaman Branch were limited to reaching the rank of rear admiral.

Although DDGs always had Commanding Officers when in commission, during lengthy periods in refit or major modernisations they were not required to demonstrate their full range of

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42 Officers who were posted as Executive Officers could subsequently have become the Commanding Officer of a DDG or other ship, or may have taken a different career path. Not all officers who held the position of either Commanding or Executive Officer, or both, were promoted further.

43 Although highest priority was given to officers of the Seaman Branch to train for award of a Full Bridge Watchkeeping Certificate, it was possible for members of all Branches to so qualify if the opportunity presented itself. See: Royal Australian Navy, *Australian Navy Orders 181/67 Officers - Bridge Watchkeeping and Ocean Navigation Certificates and Certificates of Fitness for Seaman Duties. Dated 25 April 1967.* (Canberra: Sea Power Centre Australia). Employment duties for officers other than those of the Seaman Branch prevented them from gaining the same degree of practical consolidation as members of the Seaman Branch.

44 The eligibility of only Seaman Branch members being considered for Sea Command was a consequence of the specialist nature of each of the naval Branches in meeting the needs of the Navy. See: "Specialize Or Not? Former RAN CO's Reflections on Surface Warfare Development (Rear Admiral James Goldrick, RAN Rtd)," Centre for International Maritime Security, http://cimsec.org/specialize-former-ran-cos-reflections-surface-warfare-officer-development/13305. The RAN followed the RN practice whereby seaman officers were trained to navigate and fight a warship, while others were trained to maintain and support them. The outcome was intended to be a group of officers competent to meet all the needs of the service. The focus of the RAN for a considerable period was primarily on sea-going experience, which did not adequately equip its officers for responsibilities later held at the highest levels of the defence bureaucracy where additional skills for success were required. Authoritative statements of naval practice alone were insufficient in that environment. For a discussion of the bureaucratic environment see: Nick Jans, *Once were Warriors?: Leadership, Culture and Organisational Change in the Australian Defence Organisation*, ed. Jane Hart Weston Creek, A.C.T.: Australian Defence College, Centre for Defence Command, Leadership and Management Studies, 2003. Page 23

command abilities and have therefore not been included in the following analysis of subsequent promotions. For our purposes, the criterion for being recognised as a Commanding Officer is that an individual was posted in command when the ship was operationally ready for service, which includes officers posted in command for trials periods and who then remained in command for a period of operational service.[45] It also includes being nominally posted as the Executive Officer but also posted in command on a temporary basis due to an absence of the officer nominally in command, or for some other reason.[46] On this basis, Table E-2 shows that there were 68 DDG Commanding Officers of captain, commander or lieutenant commander rank,[47] and Table E-11 shows that 55 (80.8%) reached the rank of commodore, with 16 reaching rear admiral, nine reaching vice admiral, and one officer reaching the rank of Admiral.[48] Those posted in command of a DDG therefore had reason to feel confident about their prospects of future promotion to commodore, and from that same group the RAN selected a high proportion of its most senior officers.

With two exceptions, in the 53 years from 1955 to 2008, supreme leadership of the RAN was exercised by 17 officers who came from two distinct backgrounds of senior sea command experience, corresponding to successive periods of 27 and 26 years respectively.[49] The change from aircraft carrier to DDG leadership in 1982 can be regarded as an important part of the transition of the RAN away from its British heritage and culture, towards one which

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45 Those officers who had short periods of command and also had command for longer periods, as well as those who held command twice, are only counted once.

46 Details of DDG Commanding Officers were drawn from RAN sources. For the names and periods in command of *Perth* see: http://www.navy.gov.au/hmas-perth-ii. For *Hobart* see: http://www.navy.gov.au/hmas-hobart-ii. For *Brisbane* see: http://www.navy.gov.au/hmas-brisbane-ii. Periods these ships spent in refit were obtained from multiple articles in *Navy News* as supplemented by *Reports of Proceedings.*

47 Sea Power Centre Australia, *The Navy List: 1960 to 2000* Canberra: Department of Defence (Navy), 1960 to 2000

48 The figures are accurate for officers with seniorities to 2001, but it is acknowledged that there may be additional DDG qualified officers of star rank who will have been promoted after that date.

49 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, page 311-312, and the Sea Power Centre Web Site. See: "RAN Admirals," Sea Power Centre Australia, http://www.navy.gov.au/history/people/ran-admirals. Admiral Alan Beaumont (who commanded *Brisbane*) became the Chief of the Defence Force, but was not appointed as either CNS or CN.

progressively became more characteristic of Australian culture and society.[50] The transition was not stark, in that the RAN had been on this evolutionary path from about the mid-1950s when CNS Dowling corresponded with CNO Burke concerning acquisition of guided missile destroyers.

The aircraft carrier period of leadership commenced in 1955 with Vice Admiral Sir Roy Dowling, who had commissioned the new carrier *Sydney* as its Commanding Officer in 1948.[51] In 1982 Vice Admiral James Willis, who had commanded *Melbourne,*[52] transferred leadership of the Navy to Vice Admiral David Leach who had commanded *Perth*. Leach began the DDG period of naval leadership, which ended in 2008 with the retirement of Vice Admiral Russell Shalders.[53] The two exceptions to this pattern were Vice Admirals Sir Alan McNicoll (February 1965 – April 1968)[54] and Rodney Taylor (March 1994 – June 1997)[55] who had commanded respectively the heavy cruiser *Australia* and destroyer escort *Torrens* as the Squadron Leader. Vice Admiral Michael Hudson, who followed Leach and was CNS from April 1985 to March 1991, had the distinction of commanding the *Brisbane* and *Melbourne*,[56] and is in this sense a symbolically transitional figure between the two periods.

Three former Chiefs of the RAN have provided their perspectives on how important the DDGs were in the development of their careers. Vice Admiral David Leach (CNS April 1982 to April 1985) remarks that after *Melbourne* went out of service, the DDGs were the capital ships of the Navy and "…became the culminating point of sea-going service for their Commanding Officers."[57] Vice Admiral Donald Chalmers (CN from July 1997 to July 1999) remarks "…I think that one needed that DDG experience to get to the higher ranks…I think that their DDG

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50 Of 9 vice admirals who became CNS in the carrier period, 8 had commanded a carrier. Of 8 vice admirals who commanded the RAN in the DDG period, 7 had commanded a DDG. See: David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, page 311-312,

51 For a career summary of Dowling see: http://www.navy.gov.au/biography/vice-admiral-sir-roy-russell-dowling

52 "Captains of Melbourne," *Royal Australian Navy News,* 31 October 1980, Vol23 No19, Page 15

53 For a career summary of Shalders see: http://www.navy.gov.au/biography/vice-admiral-russ-shalders

54 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, page 311-312, and the Sea Power Centre Web Site See: "RAN Admirals," Sea Power Centre Australia, http://www.navy.gov.au/history/people/ran-admirals

55 ibid. Taylor's title changed from Chief of Naval Staff to Chief of Navy on 19 February 1997.

56 Table E-12 in Appendix E summarises those in command of the RAN over the period involved in this study.

57 Interview with Vice Admiral David Leach. Page 16

experience helped."[58] Vice Admiral Christopher Ritchie (CN from July 2002 to July 2005) commanded *Brisbane* in the first Gulf War in 1991. When asked how he was selected for DDG command, he said he didn't know and assumed that others had suggested it to CNS.[59] He goes on to say that "For me the second time around (in command), I think that…put me on the map in that sense I think a successful tour in *Brisbane* was the start of the pathway for me eventually becoming CN…"[60] Chalmers' and Ritchie's remarks echo those of Leach, and acknowledge that the path to further promotion for seaman officers such as these at that time was command of a DDG. That the DDGs formed a virtually exclusive source of Chiefs of Navy for such an extended period is unsurprising given the duration of the presence of the DDG cohort of senior leaders in the RAN, but such dominance also reinforces how important the DDGs became in the career development of its future senior officers.

In commenting on the number of officers who commanded DDGs and who later became CNS or CN, Vice Admiral Walls remarks that the scale of success in reaching the higher ranks extended beyond being the professional head of the Navy, with himself being an example in becoming the Vice Chief of the Defence Force (1995 to 1997) at the same rank of vice admiral. He notes that a number of three star and many of the two star officers of the RAN had a strong career linkage to the DDGs. This rate of success, he believes, was not replicated by those officers who had commanded FFGs. Overall he considers that "…in effect a tiered system operated in the RAN for decades…" and that it had a lot to do with the DDGs.[61]

Effect of DDGs on Star Rank Promotion in the RAN

The preceding investigation of promotions to star ranks provides an indication of how officers posted to DDGs at senior levels fared later in the selection of the senior leaders and commanders of the RAN. Table E-13 provides an overall summary of percentages by Branch broken into multiple time periods. In this assessment, the promotion of DDG Qualified officers of the Seaman Branch to commodore is shown to be about half of the group, but the non-DDG Qualified officers included a moderate representation of aircrew whose membership of the Seaman Branch technically required their consideration. Table E-13 also implies that service in a DDG was not as important for promotion to commodore in the Engineering Branch, although

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58 Interview with Vice Admiral Donald Chalmers, 8 February 2013. Page 1
59 Interview with Vice Admiral Christopher Ritchie, 30 January 2013. Page 47
60 ibid pages 1-2
61 Interview with Vice Admiral Robert Walls, 6 October 2011. Page 33

when examined separately, the DDG effect for WEEOs who were DDG Qualified was markedly greater than for non-DDG Qualified WEEOs as summarised in Table E-7. That Table also shows that DDG MEOs appeared to have been at a disadvantage in relation to their peers.[62] Supply officers were normally the most junior of the Heads of Departments, and at the commodore rank no discernible DDG effect appears to have been present, as is shown in Table E-9. This situation may have been due to the evolving nature of their Branch as it transitioned to its contemporary form.

When examining promotion to rear admiral, the ratios are in favour of DDG Qualified officers. For the Seaman Branch, 80% of officers promoted to this rank had DDG backgrounds as shown in Table E-5, and this is also true of the Supply Branch as summarised in Table E-10. For the Engineering Branch, Table E-8 shows that DDG service appears to have had minimal effect overall, but taken separately and as might be expected, MEO DDG Qualified officers fared less well than their WEEO counterparts who had a promotion ratio of 80% as compared to those who were not. With the exception of Marine Engineering officers, promotion to rear admiral was therefore the point at which being DDG Qualified apparently became an important discriminating feature of career experience for all Branches of the RAN.

Table E-14 summarises the total promotions to rear admiral (by seniority) for the combined Seaman, Engineering and Supply Branches of the RAN. From 1976 to 1998 the ratio of DDG Qualified officers to all others was 34 to 14, representing a proportion of 70.8%. As shown in the same Table, from 1999 to 2001 and reflecting the change in the posting arrangements for captains and the first departure of a DDG from service, officers selected with different career backgrounds were more numerous than those of the DDGs, hence causing a decline in the DDG effect.

Table E-6 shows that an 80% ratio for seaman officers with DDG experience was also present in those selected for promotion to vice admiral, being the most senior leadership level of the RAN.

This examination demonstrates that for a sustained period the DDGs were a common career point for the major cohort of the RAN's most senior leaders. We can infer that for the duration

[62] A number of DDG MEOs were promoted to star rank but the transition of that role into one frequently occupied by former senior sailors meant they probably did not have the opportunity to gain the breadth of experience necessary. This situation gave no comparative DDG benefit to that cohort. There may have been other career management considerations involved.

of that cohort's presence at senior levels its cumulative collective influence in guiding the Navy was significant. It is also logical to infer that the nature of that influence, at both the individual and general leadership levels of the Navy and the Department of Defence, embodied much which came from their DDG service. As will be shown, these officers had the responsibility and authority to set long term policies affecting the future and culture of the Navy, and through that influence their impact on the RAN would be enduring.

Higher Level Leadership of the RAN

RAN Higher Command Structure

Shortly after its formation in 1901, the RAN structured its most senior leadership arrangements in a manner similar to those of the RN when in January 1905 it formed an Australian Board of Naval Administration.[63] Eventually it became known as the Australian Naval Board and adopted RN practices of codifying its administrative arrangements to achieve clarity of organisational relationships and responsibilities. In conducting its business, the Naval Board, and the RAN more broadly, were guided by the RN's primary volume of regulations, known as the *Queens Regulations and Admiralty Instructions* (*QR & AI*).[64] Although for much of its existence the RAN was the beneficiary of a wealth of RN publications, an unintended consequence of that benefit was that it shielded the RAN from having to make investments in its own future,[65] which included its administration. In 1976, *QR & AI* was superseded in the RAN by *ABR 5016*,[66] known as *Regulations and Instructions for the RAN,*[67] or 'RI' in its abbreviated form.[68]

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63 David Stevens. "1901-1913: The Genesis of the Australian Navy." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. III Melbourne: Oxford University Press, 2001. 5-27. Page 15

64 "The Naval Regulations Collection," http://www.royalnavalmuseum.org/info_sheets_naval_regulations.htm

65 James Goldrick, "A Fleet Not a Navy; some Thoughts on the Themes," in *Southern Trident - Strategy, History and the Rise of Australian Naval Power*, eds. David Stevens and John Reeve (Crows Nest, N.S.W.: Allen & Unwin, 2001), 291-295, page 294

66 ABR is a contraction of the title: Australian Book of Reference. Such publications provide the authoritative guidance for policy and/or detailed matters for which they have been written. The RN used the term BR (Book of Reference) for the same purpose.

67 Royal Australian Navy, *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54)* Canberra: Royal Australian Navy, 1976

68 RI was also progressively replaced by regulations promulgated as 'Defence Instructions' known as *Defence Instructions (Navy)* or DI(N) for the RAN, but RI was still being used by the RAN in 1993. A combination of these authoritative publications was in place for much of the service lives of the DDGs. RI article 0417 showed that in some QR & AI articles were still in force with the RAN.

From 1905, Naval Board members were assigned a range of responsibilities until the Board was dissolved in 1976[69] with Government implementation of the Tange Review.[70] From that time the holder of the position of CNS was recognised as being unequivocally in command of the Navy. The Chief of Naval Staff[71] was also traditionally responsible for the full range of naval policies and their execution,[72] hence the role required a person with comprehensive professional development gained through education, training and experience.[73] As we have seen, only officers who had exercised Sea Command were ever considered to become CNS, which automatically reduced the eligible pool of officers from which a choice could be made.

In conjunction with implementation of the Tange Review, new support arrangements for CNS were also put in place. The Canberra headquarters of the RAN was known as Navy Office, and comprised five major policy development and functional Divisions, each of which was headed by a rear admiral with substantial responsibility for relevant whole-of-navy matters. The arrangement is summarised in Figure 4 (derived from RI Article 0133.)[74]

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69 "Naval Board Flag Lowered for the Last Time," *Royal Australian Navy News,* 13 February 1976, Vol19 No3, Page 1

70 Department of Defence (Australia), *Australian Defence: Report on the Reorganisation of the Defence Group of Departments. Presented to the Minister for Defence, November 1973 (Tange Review)* Canberra: Dept. of Defence, 1973

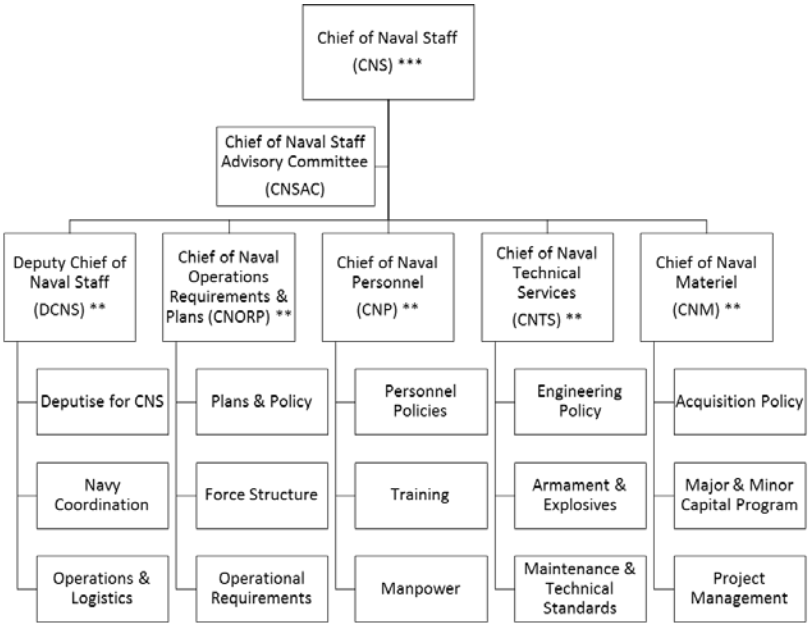
71 The title of Chief of Naval Staff (CNS) was changed to Chief of Navy (CN) in 1997. The terms are used here as they existed at the time under examination. See: David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, pages 311-312

72 Throughout this period of examination, CNS/CN held a statutory appointment which made them responsible to Australia's parliament through the most senior Defence chain of command. "Defence Act 1903 (Amended to 2006)," http://www.comlaw.gov.au/Details/C2006C00076

73 Nick Jans et al., *The Chiefs - A Study of Strategic Leadership* Canberra: Centre for Defence Leadership and Ethics, Australian Defence College, 2013. Page 106

74 Royal Australian Navy, *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54).* Chapter 1 page 5.

Figure 4: Navy Office – 1976



With adoption of the new organisation, the titles of its senior officers were changed to reflect their new responsibilities, although such titles were broadly similar to those of the preceding Naval Board.[75] After initial experience of the new arrangement, the Deputy Chief of Naval Staff (DCNS) Division, normally led by a seaman rear admiral, was seen to embrace too many functions[76] and some elements were then transferred to a new Division, known as Chief of Naval Operations Requirements and Plans (CNORP).[77] Although ultimate accountability rested with the CNS, with the RAN being a small Navy, its senior leaders' roles were less diluted in terms of influence than can be the case in much larger organisations, giving them considerable organisational power.[78] Each of these officers also had important roles via their membership of senior Defence committees which had responsibilities for the coordination and direction of the ADF more broadly.

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75 ibid page 215

76 Royal Australian Navy, *Australian Navy Orders 130-131/75 - Department of Defence Reorganisation and Organisation of the Naval Staff - Interim Stage. Dated 5 May 1975.* (Canberra: Sea Power Centre Australia)

77 Royal Australian Navy, *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54).* Chapter 1 page 5.

78 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*. See pages 60 & 215 for an organisational overview of the RAN *circa* 1932 and 1972 respectively.

In February 1976, Vice Admiral Stevenson was the first CNS under these new arrangements, and of the five rear admirals who comprised his most senior advisors, none were DDG Qualified. By December 1977 three such officers were DDG Qualified,[79] and by June 1979 four,[80] which remained the case when Vice Admiral Leach became CNS in April 1982.[81] Thus, while it is difficult to be conclusive, it is possible to suggest credibly that in 1977, when there was a significant shift in the background of the RAN's most senior leadership cohort towards those who had integrated their DDG knowledge and experience into their professional outlook, the DDG cultural influence on the Navy began to be significant. This involved perforce an understanding of USN methods and practices, gained by some in combat operations, which hitherto had not existed to that degree at that level of leadership.

As will be shown, the responsibilities of CNS's most senior advisors gave them significant whole-of-navy authority and necessarily drew upon their entire career experience. Officers with DDG experience progressively occupied those roles, with the initial incumbents being former commanding officers of DDGs on Vietnam operations. Their own successors included officers who had subsequently undertaken their DDG service at a more junior level, some of whom had commissioned the ships and also had operational experience. Three case studies of such officers will give insights in terms of how their professional careers were positively affected by those experiences. Collectively, this continuum of DDG experience at its highest levels of leadership helped change the Navy.

Senior Star Ranked Responsibilities and Stewardship of the Navy

As we have seen, from the late 1970s onwards the force structure of the RAN changed markedly from being of RN-origin to modern USN-origin; there were multiple important reviews of the entire Defence organisation having far reaching consequences; and the RAN assumed primary responsibility for the education and training of all its officers. These were critical developments in the evolution of the RAN, for the carriage of which it relied entirely upon itself, and which were overseen by its most senior officers who by then were typically drawn from those who had served in DDGs at a senior level. While the evidence is partial and

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79 Rear Admirals: Willis (A.A), Doyle and Griffiths. See: Sea Power Centre Australia, *The Navy List December 1977* Canberra: Department of Defence (Navy), 1999

80 Rear Admirals: Stevens (J.D), Loosli, Rourke and Willis (A.A). See: Sea Power Centre Australia, *The Navy List June 1979* Canberra: Department of Defence (Navy), 1999

81 Rear Admirals: Doyle, Knox, Rourke, and Lyneham. See: Sea Power Centre Australia, *The Navy List June 1982* Canberra: Department of Defence (Navy), 1999

suggestive, it can be credibly inferred that their integrated DDG knowledge and experience informed their making of important decisions as to how the RAN would evolve during their stewardship. Certainly in that process they contributed to the RAN's shift toward increasing independence and associated professional abilities in meeting its own national requirements. An overview of their responsibilities during a major proportion of the DDG period places their whole-of-navy authority into context and illustrates their avenues of influence, and hence the potential implications of their DDG service. Policy decisions taken by senior officers in Navy Office[82] were binding on all lower level organisations, including for the Commanding Officers of ships.

The position of DCNS was typically occupied by a seaman rear admiral. In June 1979, Rear Admiral J.D. Stevens,[83] who had commanded *Brisbane*,[84] became the first DDG Qualified officer to assume that role. In that position he deputised for the CNS during his absences, which with his other responsibilities gave the role of DCNS considerable influence across the entire Navy, including oversight of the preparation and management of the Navy's budget. In Navy Office, his role included responsibility for the higher level coordination of Navy Office's functional divisions, and also of the work of Navy Office and the various RAN commands. Strategic matters affecting the operational employment of the Navy came under the supervision of DCNS and set the geographic parameters for deployment of ships to support diplomatic and other initiatives. Until a subsequent change to these arrangements gave greater RAN senior level focus to logistical matters, for several years DCNS also held responsibility for strategic logistical policy. In essence, DCNS was responsible for everything that did not fit neatly within other functional areas of Navy Office, and for ensuring the cohesion of the combined efforts of the entire Navy Office organisation.

The position of CNORP was held by a seaman rear admiral responsible for the RAN's strategic plans and policy, and current and future capabilities. He also acted as head of the Seaman Branch, the largest in the RAN. In December 1977, Rear Admiral Alan Willis, the first

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82 The responsibilities of these senior officers are contained in Royal Australian Navy, *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54).* Chapter 1 pages 5-6.

83 Sea Power Centre Australia, *The Navy List June 1979* Canberra: Department of Defence (Navy), page 94

84 Sea Power Centre Australia, *The Navy List March 1970* Canberra: Department of Defence (Navy), page 157

Commanding Officer of *Brisbane*[85] and in command on its first Vietnam deployment, became the first incumbent.[86] The Division incorporated Directorates led by the heads of each Seaman Branch sub-specialisation who were either of captain or commander rank. Seaman Branch sub-specialist officers were the professional experts in their naval operational fields through completing the associated 10 to 12 months duration RN Long Course and gaining seagoing experience. Officers who qualified as a PWO undertook similar sub-specialist functional roles as their Long Course predecessors[87] and filled the same positions. Those regarded as suitable were posted to staff positions in Navy Office. In addition to advising CNORP on the future operational requirements of the RAN, their task was to develop and oversight warfare and other policies associated with the Branch.

The position of Chief of Naval Personnel (CNP) could be occupied by an officer of any Branch. In June 1976, Rear Admiral Guy Griffiths, the commissioning Commanding Officer of *Hobart* and in command during its first Vietnam deployment[88] assumed this responsibility.[89] The incumbent had responsibility for all naval manpower policy and personnel administrative matters such as conditions of service, as well the RAN training organisation. This was a key senior responsibility for an organisation which had to attract and retain officers and sailors in an environment where it had to compete with other occupations. As we have seen, while in this role Griffiths established staff training in Australia for officers of the RAN, which began in 1979, and introduced greater opportunity for them to become educated in maritime strategy and the higher order principles of their Service.[90]

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85 John Perryman and Brett Mitchell, *Australia's Navy in Vietnam - Royal Australian Navy Operations 1965-72* Silverwater, NSW, Australia: Topmill Pty Ltd, 2007 page 21

86 Sea Power Centre Australia, *The Navy List December 1977* Canberra: Department of Defence (Navy), page 39

87 Royal Australian Navy, *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54)*. Article 3161

88 John Perryman and Brett Mitchell, *Australia's Navy in Vietnam - Royal Australian Navy Operations 1965-72* Silverwater, NSW, Australia: Topmill Pty Ltd, 2007 page 8

89 Sea Power Centre Australia, *The Navy List December 1977* Canberra: Department of Defence (Navy), page 14

90 For an assessment of ADF future officer professional education requirements and a summary of that in place from opening of the RAN Staff College see: Commonwealth of Australia, *Officer Education: The Military After Next*, ed. Joint Standing Committee on Foreign Affairs, Defence and Trade Canberra: Commonwealth of Australia, October 1995. Terms of reference for the RAN Staff College are shown in the report at Chapter 7.

The role of Chief of Naval Technical Services (CNTS) was focussed on whole-of-navy engineering matters and performed by an engineering qualified rear admiral, who also became the head of the RAN Engineering Branch. In March 1976 the incumbent was Rear Admiral Maxwell Reed[91] who had been the RAN representative at Great Lakes, Michigan, while *Perth* was building.[92] Although he had not served in a DDG, his experiences in that period would have ensured his comprehensive knowledge of the ships' physical attributes as well as his understanding of USN technical methods. The first DDG Qualified rear admiral to become CNTS was Rear Admiral Daryall Lynham, who assumed the role in December 1980.[93] As a Commander, Lynam had been the commissioning Weapons Electrical Engineering Officer of *Perth*[94] and brought a considerable understanding of DDG technical capabilities to his role as CNTS. In that role his technical responsibilities and authority included involvement in assessing the viability of modernising the ships with NCDS. As we have seen, the Engineering Branch provided the full range of technical skills required across the RAN and its officers comprised those qualified in Weapons Electrical Engineering, Marine Engineering and Aeronautical Engineering. Some officers also qualified as submariners and specialised in submarine-related engineering fields. Although they were members of the same Branch, the Weapons Electrical and Marine Engineering specialists in warships were led and managed as individual departments with separate responsibilities.[95]

The responsibilities of the Chief of Naval Materiel (CNM) included acquisition and provision of future support arrangements for all new and modified RAN capabilities. This required both an engineering and logistical focus as well as an ability to succeed in the new Defence capital acquisition and resource management environment created through implementation of the Tange Review. In February 1977, Rear Admiral Peter Doyle, who had commanded *Perth* on its first Vietnam deployment, took on those responsibilities,[96] which included the purchase of

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91 Sea Power Centre Australia, *The Navy List December 1977* Canberra: Department of Defence (Navy), page 30

92 Interview with Rear Admiral Maxwell Reed, 8 February 2012. Page 18

93 Sea Power Centre Australia, *The Navy List June 1981* Canberra: Department of Defence (Navy), page 126

94 Sea Power Centre Australia, *The Navy List March 1965* Canberra: Department of Defence (Navy), page 150

95 Royal Australian Navy, *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54).* Article 4111.

96 Sea Power Centre Australia, *The Navy List December 1977* Canberra: Department of Defence (Navy), page 139

FFGs and their Seahawk helicopters, and considering the future of *Melbourne*. From 1979 until 1984,[97] the position was filled by Rear Admiral William Rourke, who had acted as the DDG project officer in the Australian Embassy in Washington, and had then commissioned *Brisbane* as its MEO. Rourke did much to introduce USN project management and logistical techniques into RAN project management arrangements and overcome the shortcomings in these areas we have already observed.[98]

The Fleet Commander was a seaman rear admiral, and in 1979 Rear Admiral David Leach became the first DDG Qualified officer to assume that responsibility.[99] The Fleet Commander was responsible to CNS for the full command, training and efficiency of all operational assets assigned to him, as well as for all associated administration. He was essentially the warfighting Admiral of the RAN who set the required standards for all the operational organisations and units of the Navy and measured their performance on a continuing basis. His role encompassed relations with his international counterparts and, with his staff, he would either command his forces from *Melbourne* while it was in service, or from the dedicated shore based Headquarters in Sydney.

The Naval Support Commander could be a rear admiral selected from any Branch, and in 1978 Rear Admiral Guy Griffiths became the first DDG Qualified officer to assume that responsibility after relinquishing his role as Chief of Naval Personnel.[100] The Support Commander was responsible to CNS for the provision of materiel support for all ships, aircraft, support craft and shore establishments in the RAN. This meant that operational units under the command of the Fleet Commander were directly supported by the Support Commander, thereby ensuring that the logistical element of operations was given the priority the Navy had assigned to it.

Each of these officers was responsible for the daily activities of the two largest commands in the RAN, which between them comprised the majority of the officers and sailors in the Navy, as well as of its civilian staff. The authority of these commanders gave them great influence

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97 Sea Power Centre Australia, *The Navy List December 1979 to June 1984* Canberra: Department of Defence (Navy), 1999

98 For example see: Royal Australian Navy, *ABR 5245 - Royal Australian Navy Integrated Logistic Support Manual (SPC.DS.55)* Canberra: Sea Power Centre Australia, 1979

99 Sea Power Centre Australia, *The Navy List June 1979* Canberra: Department of Defence (Navy), page 22

100 Sea Power Centre Australia, *The Navy List January 1979* Canberra: Department of Defence (Navy), page 15

over the culture of their commands, as well as important status when advising CNS and his other admirals on the overall state of the RAN in terms of matters associated with their responsibilities.

The Canberra based rear admirals, supplemented by the then civilian Director General of Supply – Navy, were CNS's closest advisors and permanent members of the RAN's most senior committee, known as the CNS Advisory Committee (CNSAC).[101] CNSAC canvassed the most important policy matters confronting the Navy as well as issues concerning resourcing and long term RAN planning. CNS was thus advised by these senior and experienced officers and able to make decisions and give direction as needed. As has been shown, the individual authority of members was considerable, as was the power of the committee in shaping how the RAN was to evolve. As members of CNSAC and as heads of their Divisions, after CNS these rear admirals were the most powerful policy making officers in the RAN. The Fleet and Support Commanders were no less important in terms of their ability to affect the day to day operations of the Navy, and although not initially permanent members of CNSAC[102] their operational responsibilities meant that they were also those to whom CNS turned for advice.

DDG Commissioning Experiences and Later Careers: Three Case Studies

For a considerable period of its existence, the RAN's officers were grounded in professional matters through its intimate affiliation with the RN. Following from the decision in 1909 to form an Australian Fleet Unit, its officers were trained to be interchangeable with their RN counterparts. Hence, when the first entry of RAN cadet-midshipman arrived at Osborne House in Geelong on 13 February 1913 to commence training,[103] their syllabus was based on the RN model.[104] The training of RAN officers was conducted in both Australia and the UK for most of the 20th century,[105] with mutual benefit to each Navy, but particularly for the RAN, whose officers quickly acquired the culture and professional standards required through their

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101 "Naval Board Flag Lowered for the Last Time," *Royal Australian Navy News,* 13 February 1976, Vol19 No3, Page 1.

102 Ibid. The Fleet and Support Commanders later became members of CNSAC. The precise date cannot be determined.

103 David Stevens. "1901-1913: The Genesis of the Australian Navy." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. III Melbourne: Oxford University Press, 2001. 5-27. Page 24

104 P. D. Jones, "The Royal Australian Naval College: Creswell's Last Great Legacy (Creswell Oration 2013)," *Headmark (Journal of the Australian Naval Institute),* 148, 2013, 44-50, page 45

105 I. J. Cunningham, *Work Hard Play Hard, the Royal Australian Naval College 1913-1988* Canberra: AGPS Press, 1988, pages 1-40

intensive exposure to the RN. The RAN also created its own operational heritage through being an intrinsic part of the RN in two world wars.[106] Thus, from the early 1960s the officers being posted to the DDGs being constructed in America had all been trained by the RN and had served in ships of RN-origin.[107]

Officers selected to commission a DDG were expected to have sufficient skills and knowledge to assimilate into their new ship, and had to be selected in time to undergo the additional training needed to operate it safely. The complete difference between the DDGs and other RAN ships then in service meant there were no suitable training facilities in Australia. Accordingly, when the RAN sought its advice, the USN recommended training that should be undertaken by Australian officers and sailors joining the DDGs, and this was organised directly via the USN Bureau of Personnel and the Bureau of Ships by the Australian Naval Attaché in Washington.[108] After completion of building, the ships and crews had to complete further trials and training at sea, after which the ship could be formally transferred from the USN to the RAN.

It is against this backdrop of the RAN's RN heritage and the commissioning of its first American warships that the experiences of three individual officers are highlighted here as case studies. They became immediate participants in the transitional era for the RAN and their observations shed light on that era. They joined the RAN between 1950 and 1958 when, as we have seen, the training of its junior officers was conducted under an academic and training regime still tightly linked to that of the RN, and when the RAN in general followed RN methods and practices. They all left after the RAN had conducted operations in Vietnam, had lost its aircraft carrier and fixed wing aviation capability but introduced helicopter operations from its frigates, had reintroduced a submarine service, had acquired NCDS, and had become a Navy with its major operational force elements based largely upon USN-origin capabilities. Just as

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106 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, Chapter 2 and Chapters 5 & 6

107 As an indication of the initial importance but changing utility of RN training to the RAN, the number of RAN officers of all Branches under training with the RN was reduced from 91 in 1970, to 29 in 1975. See: Alastair Cooper, "At the Crossroads: Anglo-Australian Naval Relations, 1945-1971," *The Journal of Military History,* Vol 58, 4, 1994, 699-718, page 716

108 Interview with Rear Admiral Maxwell Reed, 8 February 2012. Page 17. See also: Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder BU (Vice Admiral Henry Burrell RAN) Washington DC: United States Navy. Letter Burke to Burrell 23 December 1960.

importantly, its relationship with the RN had been replaced by one with the USN, but on a very different basis.

Each of these officers is from one of the three major Branches of the RAN: Seaman, Engineering and Supply and Secretariat. They have been selected because they had experiences broadly representative of others of the same era, albeit with individual careers. They were all members of a DDG commissioning crew, gained operational experience in Vietnam, reached star rank, and became members of the RAN's senior leadership before their careers ended. Their service therefore coincided with an extended period of considerable change to the RAN, during which time they and their DDG Qualified contemporaries contributed to that change. Their testimony has been utilised elsewhere in this thesis, but the following analysis explores further the formative stages of their careers, their experiences of DDG service, and their subsequent roles. Jason Sears has noted of the previous RAN officer generation that "The typical RANC officer was most likely to have been born into an [sic] well-to-do, upper-middle class family living in one of Australia's capital cities." [109] These three officers did not come from wealthy or otherwise influential family backgrounds, and while it is beyond the scope of this thesis, this research suggest that from the early 1950s, or possibly before, the numbers joining the RANC who were more representative of wider Australian society had started to increase. The cases of these three officers reflect the nature of their service in the RAN and its evolving culture from the early 1950s onwards, and therefore give insights into the circumstances of the time and the role of the 'DDG cohort'.

When chosen to commission a DDG, these officers had no sense of being regarded as 'special' within the officer ranks of the RAN. Notwithstanding their false or real modesty, we can infer that those responsible for selecting them as crew members of the RAN's first two DDGs would not have been unaware of the professional challenges they would face in a new and unique operational environment. Nor would they have been unaware of the implications for the reputation of the RAN if its officers had not been up to the task. The Navy in the mid-1960s

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[109] Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, page 58. Sears also observes the RN drew officers from elite social groups as one of three traditions it practiced in their recruitment and suggests there was a semblance by the RAN of similar practice. The two other traditions used by the RN were: recruitment of officers at an early age and insistence on sea service. See: Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, page i.

was also busy, particularly with its duties with the Strategic Reserve.[110] Secretary of the Navy, Mr Sam Landau, reported to the Minister for the Navy, Mr Frederick Chaney, in March 1965 that "…skilled manpower, including officers, in the Navy is over extended…" [111] Notwithstanding, we can also infer that the importance of the DDGs as powerful new ships intended to become central to the RAN's order of battle, would have meant that those who commissioned them would almost certainly have been chosen with considerable care. The subsequently distinguished careers of these three officers, who later held very influential senior naval and defence roles, are also consistent with their professional potential perhaps already being perceived to a degree that justified their selection in commissioning a DDG. It could also have been the case that an element of luck was involved, because it is likely that there were other officers with similar credentials. Their good fortune was to have been qualified as Lieutenants to hold positions of responsibility in a new DDG and, critically, to have been available when posting decisions had to be made. Given what might be termed the 'luck of the draw', had other officers been similarly placed, their own careers might have taken similar paths and the officers considered here might have had entirely different careers. Such circumstances had enduring consequences for these latter officers and through them the RAN, brought about through promotion of the culture which their DDG service nurtured.

Robert Walls was born in March 1941 and joined the RAN in 1955 as a seaman officer in the last 13 year old officer entry to the RAN.[112] He grew up in the farming district of Colac, Victoria, and had been encouraged by his teachers to choose a different vocation. With his father having been in the RAN during WWII, the RAN became his choice.[113] Walls was one of those few who, as Sears notes, had joined the RANC from working class backgrounds.[114] Walls

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110 Alastair Cooper. "1955-1972: The Era of Forward Defence." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001. 181-209.

111 Commonwealth of Australia, *Personal Papers of Prime Minister Menzies: Haul Down Report by Vice Admiral Sir Hastings Harrington [Includes Comments by Alan McNicoll and Secretary, Department of the Navy, and Correspondence from Hon F C Chaney Re Skyhawk Aircraft]*, Vol. NAA: M2576, 51 (Canberra: National Archives of Australia) Some Brief Comments on Admiral Harrington's "Haul Down" Report of February 1965. Dated 23 March 1965, page 6

112 Interview with Vice Admiral Robert Walls, 30 August 2011. Page 1

113 ibid

114 Sears is not definitive in terms of what he regards as a 'few' or when the profile he portrays started to change. See: Jason Sears, *"Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50"* (PhD Thesis), UNSW Canberra, page 58

regarded his experience at RANC[115] as completely the opposite of that he later had at the RN's Britannia Royal Naval College in Dartmouth, which he describes as 'enlightened'.[116] While at Dartmouth, Walls recalls that CNS Burrell visited as part of his travel to the UK and US to seek options for guided missile destroyers.[117] Following his initial training, Walls joined *Derwent* as it was building and then commissioned, and served in it when it subsequently deployed with Commonwealth forces engaged in Indonesian Konfrontasi operations.[118]

When selected for *Hobart* as it was building in the US, Lieutenant Walls had recently completed an air controller's course at HMAS *Watson* in Sydney. He remarks that his career was being managed in what appeared an arbitrary manner, and notes his dissatisfaction with the rules associated with his being unable to take his wife to America. When asked how he was selected for his posting he remarks "Buggered if I know … I've got no idea …what career managements were in place no idea at all…I was going to be away for 11 months 3 weeks and I think it was 2 days altogether and if I had been away for 12 months or 365 days I could have taken my newly married wife with me."[119] Walls underwent further air interceptor controller (AIC) training in the United States as part of his pre-commissioning training for *Hobart*.[120] He comments on the intensity of the USN training regime "…I had to go to night school. So I had to learn how to be an AIC under the USN start from scratch rules and had to learn how to use NTDS because they were training people to do that there."[121] Walls has fond memories of his first exposure to working with the USN.[122]

After *Hobart*'s first deployment to Vietnam, Walls was posted to *Watson* and tasked with assisting in the work up of *Hobart* for its second deployment to relieve *Perth*, then on its first

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115 In 1937, the 13 year old RANC entry scheme was considered by David Hamer (a cadet midshipman at RANC) to have been based on English public school methods of 1860 and constructed from the memories of RANC staff who attended the Britannia RN College at Dartmouth many years earlier. See: Jason Sears, "*Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50*" (PhD Thesis), UNSW Canberra, page 64

116 Interview with Vice Admiral Robert Walls, 30 August 2011. Page 2

117 ibid page 10

118 ibid pages 10-11

119 ibid page 12

120 ibid page 15. Walls was required to control USN aircraft as part of *Hobart's* trials and workup. He had to requalify as an air controller through the USN training system to satisfy its requirements.

121 ibid page 14

122 ibid page 15

deployment.[123] He regards the RAN process of working up a new ship, such as he had experienced in *Derwent*, to be much inferior to that he experienced with the USN.[124] From that same experience, Captain Guy Griffiths (had) later successfully recommended the RAN adopt the USN method.[125] Before that took effect, Walls notes that the RAN practice was one largely of self-help "…so the documentation to support learning, training, operational performance was not good. The Americans' on the other hand was superb."[126] Walls later had multiple postings to DDGs, including the command of *Brisbane* during and after it completed its final modernisation program.[127]

As we have seen in Chapter 3, as preparations for the first Gulf War of 1990/91 progressed, Commodore Walls assessed and advised on RAN capabilities needed, and in that role he worked with the Commander of the USN 5th Fleet, with whom he had a personal relationship from his earlier USN experiences.[128] Later, when he was a rear admiral and the RAN Maritime Commander, he was designated as a battle force commander for Exercise RIMPAC-92,[129] where he again built upon his established personal relationships with senior USN colleagues so as to work effectively with his USN subordinate commanders.[130] His role at RIMPAC represented a stage of Australian professional maturity in that it reflected the growth of USN confidence in the RAN and its senior leaders, which stemmed from the connections forged in the early days of its acquisition of the DDGs. In Walls' role as Vice Chief of the Defence Force from 1995 to 1997, he became one of the most powerful and influential officers in the ADF. He had responsibility for the majority of Australia's tri-service capabilities and policies, including intensification of the ADF's relationship with senior echelons of the United States military through the high level meetings he attended in representing Australia.[131] His career was marked by constant change in the RAN and its relationship with government, and by

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123 ibid page 22
124 ibid page 17
125 Griffiths called upon a USN colleague who headed the USN Fleet Training Group in San Diego to treat *Hobart* as if it were a USN DDG working up. See: Interview with Rear Admiral Guy Griffiths, page 15. The RAN Fleet Commander acknowledged its value for *Perth's* Vietnam workup. See: Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1968 to December 1969,* AWM78-292-6 Canberra: Australian War Memorial. Page 87
126 Interview with Vice Admiral Robert Walls, 30 August 2011, page 17
127 Interview with Vice Admiral Robert Walls, 6 October 2011. Page 28
128 ibid page 31
129 See Appendix K
130 Interview with Vice Admiral Robert Walls, page 35
131 ibid pages 34-35

changing organisational dynamics as the ADF adapted to being a more tri-service organisation with greater centralisation in decision making. By 1997 when he retired from the RAN, the DDGs had almost reached the end of their service lives, for most of which there had been a strong bond between individuals and the ships. Walls was one of those DDG officers who influenced the RAN in its becoming more self-assured and self-reliant to a degree unimagined in 1955 when he joined.

Ormsby Cooper was born in July 1936 in Kyabram,[132] northern central Victoria, and became a Weapons Electrical Engineer Officer. He recalls that after attending a two room country primary school he went to the local higher elementary school, but then had few educational options because they would have been unaffordable for his parents.[133] He joined the RAN as a 13 year old in 1950 and, like Walls, found the discipline and conditions at times 'pretty grim'.[134] Also like Walls, his background could be regarded as more working class than wealthy or elite. After completion of his training at the RANC in 1953 (at *Cerberus*) and then with the RN, he decided to become an Electrical Officer. With (later Rear Admiral) Oscar Hughes, he attended Melbourne University, graduating with a degree in electrical engineering[135] and becoming one of the RAN's first engineer officers to do so. Following more training with the RN, he returned to Australia and joined *Parramatta*, then under the command of Commander Guy Griffiths.[136] Cooper was at the forefront of a formative chapter for the RAN as it began moving towards electronic systems being central to its fighting capabilities, and as it diverged from acquiring equipment and ships from the RN.

Lieutenant Ormsby Cooper was a commissioning crew member of *Perth,* but prior to joining he had been the Electrical Officer of *Queenborough* and assisted other members of the ship's company in placing the ship into Reserve.[137] His experience with Navy's career management arrangements was similar to that of Walls and he remarks that "Here I was at the end of a posting, the ship had gone into mothballs and I went off on leave and the next thing I get a

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132 Interview with Commodore Ormsby Cooper, 15 September 2011, page 2
133 ibid
134 ibid page 3
135 ibid page 8
136 ibid page 10
137 A ship in Reserve is one that has been decommissioned and preserved for possible future use. It is unmanned and maintained at the lowest possible level.

phone call saying 'how'd you like to go to America?' Simple as that."[138] Cooper undertook training for approximately 12 months in the United States before joining *Perth* as a technical officer.[139]

An early comprehensive guide for those embarking on that American journey was included in the December 1963 edition of *Navy News*, intended to help prepare those concerned for their first experience of living in the United States. As an indication of the degree of self-help expected from those taking their families with them, the advice was:

> "…you are coming to America for duty in connection with the DDGs…to work hard… you must be prepared not to be able to assist your wife and family in the search for accommodation… the prime purpose of your coming to America is to receive necessary instruction to enable you to commission the DDGs and nothing will be allowed to interfere with this main aim."[140]

Like Walls, Cooper considers that personnel and family matters were not given enough consideration and (he felt) that the sense of the *Navy News* article in giving priority to commissioning the ships was taken literally to an unreasonable degree by naval administrators.[141] Cooper found time to provide insights into life in the United States, providing an article for *Navy News* in May 1964,[142] giving a largely positive impression of conditions as he found them.

Cooper's experience in *Perth* was the first of multiple postings to DDGs and the beginning of his career-long involvement with their technical support and improvement. As we have seen in Chapter 5, Cooper's first experience in America contributed to his developing a keen awareness of the importance of logistical support.[143] As seen in Chapter 4, he came to the

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138 Interview with Commodore Ormsby Cooper, 15 September 2011. Page 12

139 ibid page 13

140 "So You are Going to America," *Royal Australian Navy News,* 13 December 1963, Vol6 No25, Page 2-3

141 Cooper comments that *Perth's* Coxswain, who had a large family, was supported by USN Chief Petty Officers until the administrative arrangements for him being paid were resolved. Interview with Commodore Ormsby Cooper, 15 September, page 17

142 "Life in America - A Message from Mare Island," *Royal Australian Navy News,* 1 May 1964, Vol7 No9, Page 10. The same edition reported the Minister for the Navy, Mr Chaney, as saying that the RAN was changing its training of artificers to meet the needs of the missile age, a circumstance substantially contributed to by the advanced technical capabilities of the DDGs.

143 Interview with Commodore Ormsby Cooper, 15 September 2011, page 24

conclusion that USN combat systems capabilities were more advanced than those of the RN,[144] and his critical role in the formative days of establishing CDSC had long lasting positive effects on how the RAN introduced NCDS and subsequently gained from that exercise. Cooper considers himself to have "…gone American"[145] which attitude stemmed from his DDG experiences and was progressively integrated into his thinking during his career. Cooper reached the rank of commodore and became the Deputy Chief of Naval Material, responsible for advising the Chief of Naval Materiel on all major capital acquisition programs for the RAN. These included aspects of the Seahawk helicopter, the RAN's first multi-role helicopter of USN origin and designed for operations from FFGs,[146] and of the combat systems of the RAN's ill-fated Aircraft Carrier Replacement program.[147] From the early 1960s until he retired in 1985, Cooper was closely associated with and prominent in the operation, support and acquisition of new technologies introduced to the RAN, many of which were sourced from the USN. He was influential in terms of how the DDGs were operated, maintained and modernised, and he used that experience in shaping how other major technical matters in the RAN evolved. We have seen that the close linkage of technical capabilities to operational performance became more profoundly understood by the RAN during the period of his career, which process was aided by Cooper's efforts and those of his colleagues such as Rear Admiral Peter Purcell and Commodore Ian Holmes. In turn, that understanding became cause for broader change, with the RAN necessarily having to become more professionally competent and independent. Cooper and his colleagues were influential members of a wider naval organisation that progressively changed its character.

Murray Forrest was born in Kogarah, a suburb of Sydney, in February 1942 and joined the RAN in 1958 after attending Canberra High School.[148] His father was an insurance agent in Canberra[149] but, like Walls and Cooper, Forrest didn't have any sense that his family belonged to a special group. Forrest's recollections of RANC are not as severe as those of Walls and Cooper, but he nonetheless recalls that it required hard work and dedicated effort to

144 Interview with Commodore Ormsby Cooper, 18 October 2011, page 14
145 Interview with Commodore Ormsby Cooper, 15 September 2011, page 35
146 Interview with Commodore Ormsby Cooper, 18 October 2011, page 17
147 ibid page 14
148 http://www.navy.gov.au/biography/rear-admiral-murray-bruce-forrest
149 Interview with Rear Admiral Murray Forrest, 9 December 2011. Page 5

succeed.[150] Forrest won the Queen's Medal in 1960[151] for his achievements and became Chief Cadet Captain in his third year at RANC.[152]

After completion of initial training, including with the RN, he decided to become a Supply Officer. He notes that when he was posted to join *Hobart* in the United States as its Deputy Supply Officer, he had only six month's seniority as a Lieutenant.[153] Forrest remarks that he was then working for Lieutenant Commander Richard (Dick) Brown, the Admiral's Secretary in the office of Flag Officer in Command Eastern Australian Area (FOCEA). Brown had been selected as the Supply Officer of *Hobart*, and then convinced the posting officer in Canberra that Forrest should be his deputy.[154] Forrest had expected to follow the conventional career path of his contemporaries and gain experience in a variety of sea and shore postings, hence the posting to *Hobart* came as a surprise. Forrest was single at the time although he had recently become engaged and, like Walls, mistakenly expected that he would not be away from Australia for more than 12 months.[155]

On arrival in the United States, Forrest went to Rhode Island and arranged administrative support for the crews of *Perth* and *Hobart* so they could be paid and otherwise assisted. Subsequently he spent four weeks at the USN Supply School in Athens, Georgia, where he learned about the USN method of managing stores and had his first exposure to the USN's methods of supporting its ships.[156] Forrest also notes that his Supply training in the RAN and RN had consisted primarily of learning on-the-job, which he found inadequate.[157] He contrasts his USN training with that of *Hobart's* technical officers, who typically had in the order of 12 months training before they joined, and felt that his own was not nearly as comprehensive.[158] Forrest believes the operational logistical support in Vietnam provided by the USN Supply organisation was impressive, being highly customer focussed and working very hard to ensure

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150 Interview with Rear Admiral Murray Forrest, 9 December 2011. Page 7

151 The medal was initially presented annually to the cadet midshipman who was the most deserving and 'displayed gentlemanly bearing, character, good influence among his fellows and officer-like qualities.' It is now presented to the officer who has exhibited exemplary conduct, performance of duty and a high level of achievement whilst undergoing initial training and application courses.' See: http://www.navy.gov.au/history/tradition/king-and-queens-gold-medals

152 Interview with Rear Admiral Murray Forrest, 9 December 2011. Page 6

153 ibid page 3

154 ibid

155 ibid pages 18-19

156 ibid

157 ibid page 16

158 ibid

that ships were provided with the materiel they needed.[159] Like Campbell and Cooper, Forrest found that RAN logistic planning for the DDGs needed improvement.

As we have seen in Chapter 5, from his experience in *Hobart* Forrest formed the view that the supply aspects of supporting ships, particularly the value of storing ships properly with spare parts, was not well understood by his RAN Supply superiors. When he departed *Hobart* he was posted to the Supply School at *Cerberus*.[160] In that influential post Forrest had the opportunity to pass on the fruits of his experience to officers and sailors of the Supply Branch, which hitherto had had no detailed comprehension of what Forrest knew was necessary to meet its new challenges. Forrest thus contributed to the process of change which the Branch had to undergo to become more appropriately skilled to meet the needs of the Navy,[161] a process which reflected his recognition that relying solely on 'learning on-the-job', as had been his experience, was a flawed basis for building and retaining expertise. As a Commodore, Forrest held several key positions dealing with RAN logistical support in which he, like Walls and Cooper, progressively applied his USN and DDG experience to adapt the way in which the Navy managed its logistical requirements. Forrest was promoted to Rear Admiral in 1995 and became the Assistant Chief of Naval Personnel. In addition to fulfilling these responsibilities he assisted CNS Vice Admiral Rodney Taylor in the difficult task of implementing the Defence Efficiency Review then being conducted, under which many personnel changes included reducing the number of officers in the RAN.[162] One position of Rear Admiral to be made redundant was that occupied by Forrest, a consequence of transferring service personnel management functions to the growing central organisation of Defence. Forrest retired in 1997 following 39 years' service.[163]

Forrest's experiences and roles were akin to those of his colleagues Rear Admirals Ian Crawford and David Campbell. His first introduction to non-RN Supply and other methods and practices was through his service in a DDG and, like his colleagues, he found those approaches to be professionally in accord with the needs of the RAN and its new ships.

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159 ibid page 27
160 ibid page 16
161 ibid
162 Interview with Rear Admiral Murray Forrest, 19 December 2011. Pages 26-27
163 ibid. For a summary of Forrest's career: See: http://www.navy.gov.au/biography/rear-admiral-murray-bruce-forrest

These three officers were each exposed to what they regarded as the impressive level of complexity and professionalism of the USN. They were able to contrast it clearly with their experience of the RN, and found the USN to be decidedly superior in many respects. Their experiences came at a time when Australia's culture was shifting away from its British heritage and the USN was clearly the successor to the RN as the world's most powerful Navy. Interaction by these members of the RAN with their USN counterparts in America exposed them to a very different culture to that of the RN and RAN.

Their experience of commissioning a DDG, intensified by operational service and the perceived value of combat experience in Vietnam, was at a formative stage in their careers which shaped career-long attitudes and behaviours different from those they had previously acquired. For an extended period following their first DDG experiences, the increasing influence exercised by these officers progressively impacted on each of the areas in which the RAN required professional mastery: operations, technical and supply, as well as on broader naval and defence contexts. In this way they all contributed to shaping the RAN, directing it towards greater self-reliance and towards being a more professionally independent and unambiguously Australian Service.

Conclusions - Impact of the DDGs on the Senior Leadership of the RAN

This chapter has examined the influence of the DDGs on formation of the RAN's senior leadership through its star ranked officers. These officers emerged through their consistently superior performance and potential as compared with their peers. Service in a DDG was not of itself sufficient reason to promote these officers, but for a period of time it was a common career experience, and this suggests strongly that the Navy's senior leadership regarded DDG service as an important test of high levels of sea-going professional excellence. The modesty expressed by three particular officers posted to commission the ships while in the rank of Lieutenant, and who also reached star rank, may well understate the degree to which their professional competence and potential had already been noted. Through understanding the importance of the DDGs in the RAN's order of battle during a time when heavy demands were being made on its manpower, it can be similarly speculated that other officers posted to commission the ships would also have been in good repute. The high reputation of the DDGs can be seen to have come from the interplay of their modernity with the strong performance of the individuals who manned them. The ships became catalysts in terms of high professional

standards, underlining the strong interactive relationship between the psychology of individuals and the physical ships.

For approximately the first 80 years of its history, the training and experience of officers in the RAN closely matched those of their RN counterparts. The grounding gained by RAN officers while under training and on service with the RN was an extraordinary opportunity in terms of the RAN gaining unfettered access to the benefit of hundreds of years of accumulated professional development by one of the world's greatest navies. The RAN also acquired operational experience through working intimately with the RN in each World War, Korea and the Malaysian confrontation. All of this was to the advantage of the relatively young and evolving RAN, and provided a strong underpinning of professional expertise in those who then served in DDGs.

The Government's decision in 1961 to acquire two Adams class DDGs from the USN, and subsequently a third, introduced the RAN to two important challenges. The first was that it had to operate a destroyer that was much more technically advanced and operationally capable than any other it then had in the Fleet, or had in prospect. The second was that the RAN had to learn new ways of operating, supporting and maintaining advanced warships without the assistance of the RN. Those challenges were not of central or at least conscious concern to officers chosen to commission the ships. Their prior education, training and experience were found to be at least adequate in enabling them to adapt to the differences they found.

The extended Vietnam deployment cycles for the DDGs began soon after *Hobart* arrived in Australia and provided the RAN with its first combat experience without an RN presence, which gave some members of the RAN new operational insights as to how a different Navy worked. Involvement in the Vietnam War, however, prevented deeper integration of the DDGs into the rest of the RAN and served to amplify their detachment from a Navy that was otherwise still predominantly of an RN culture. Whilst on deployment to Vietnam, the DDGs became part of the USN 7th Fleet, which gave all Branches of the RAN exposure to modern USN concepts, but the Supply Branch particularly regarded the USN's customer-oriented methods of operational logistical support as superior to those in use by the RAN. USN logistical methods were eventually introduced to the broader RAN by senior officers of the Supply Branch because of their DDG experience. During the period under examination, 80% of all

Supply Officers selected for promotion to rear admiral had served as the Supply Officer of a DDG.

Vietnam deployments also gave DDG crews modern combat experience, an asset highly valued in any Navy because it requires the highest standards to win. Other personnel had to await the next opportunity, which if it did not arise might result in their careers taking second place to those of people who went. In that sense, the DDGs constituted the premier fighting element of the RAN's surface combatants and it raised them, with their crews, above others. The value of its Vietnam experience in an American theatre of combat operations was long lasting for the RAN in terms of its warfighting skills, its deeper relationship with the USN, and in boosting its confidence because of having achieved such results without the aid of the RN.

For most of their service lives the rank and seniority of their Commanding Officers meant that DDGs were the senior destroyers in the RAN. The ships were usually, for individuals, a second major surface combatant command, and therefore a sign of expected continuing high performance. Warship command requires the application of various facets of the naval profession, effective leadership under stress and danger being the most important. Commanding Officers of DDGs were therefore typically able to mentor other officers and sailors. Approximately 80% of those who commanded a DDG were promoted to the rank of commodore, and approximately 72% of all Seaman Branch promotions to rear admiral were officers who had commanded a DDG. The relative advantage for promotion to star rank gained by DDG Qualified Commanding Officers was significant.

The Heads of the Weapons Electrical Department of a DDG were typically officers who had been previously posted to DDGs as systems engineers. This was not surprising given the extensive education and training necessary to fulfil their responsibilities. Reapplication and development of that expertise was a logical approach to the RAN's investment in human capital. It also gave WEEOs the capacity to mentor other technical officers still gaining experience. WEEOs found that their senior service in DDGs had a positive effect on their future prospects, with 80% of all WEEOs selected for the rank of rear admiral having had it. Conversely, and while their selection for serving in a DDG was probably on a comparable basis to that of other senior officers, the MEOs of DDGs as a group did not benefit as positively in terms of promotion as their WEEO counterparts. This appears to have been a consequence of the number of DDG MEOs being officers who were former senior sailors, an important group

needed to keep the ships operational, but whose careers did not permit them to gain the breadth of experience necessary for higher things.

For 53 years, the RAN was commanded by 17 officers produced during two successive periods in the existence of the RAN. From 1955 to 1982, eight of the 9 vice admirals who became CNS had commanded an aircraft carrier, and from 1982 to 2008, seven of the eight vice admirals who became CNS/CN had commanded a DDG. From 1974 when the first DDG Qualified officer was promoted to commodore, and from mid-1976 onwards when the first DDG Qualified officer was promoted to rear admiral, the DDG cohort became the predominant source of senior advice to its Chief in guiding the RAN towards its future. After the Chief, the rear admirals of the RAN were its most powerful officers because they had the authority to implement enduring policies affecting the Navy. Their DDG experience was integrated into their overall approach to their responsibilities, becoming an intrinsic factor in the continuing development of the RAN.

Not only were the naval Chiefs and their most senior advisors drawn from the DDGs. So too were senior officers associated with the development of defence and naval strategic policy, capability development, major capital acquisition and logistical support. As we have seen in this and earlier chapters, examples of their collective influence included acquisition of Seahawk helicopters and additional FFGs, choice of American combat systems and weapons for the DDGs and FFGs, closer intelligence arrangements with the USN, and redevelopment of RAN and ADF logistical management methods to include detailed planning and management of the through life support arrangements for platforms and systems.

There were only three DDGs in their class, as against six River class and eventually six FFGs. At their zenith, DDGs comprised one third of the RAN's surface combatants. The pool from which many of the RAN's senior leaders of all Branches were drawn was therefore relatively small, reinforcing the sense that successful service at a senior level in a DDG bestowed better promotion prospects up to rear admiral than service elsewhere. The Marine Engineering Branch was the notable exception to that outcome.

The exposure of the RAN's senior leadership to USN practices and methods, initially gained through their DDG service, became integrated with the RN legacy. In their whole-of-navy responsibilities these officers guided the RAN at a time when its deepening relationship with the USN resulted in it having to be less dependent upon the RN, and more upon itself. The

enduring legacy of these senior leaders, and that of the DDGs through them, was the way the RAN changed during and after their years of senior service, whereby it became more self-reliant, and more distinctively Australia's Navy.

Chapter 7 – Conclusion

> "The purchase of the DDGs…marked a milestone in the RAN's history. It was a wholesale change that introduced new technologies throughout the navy and affected all personnel…The cost of acquiring and operating the ships was enormous, but farther and faster than any previous development, the changes wrought by the DDGs pushed the navy down the path towards becoming a uniquely Australian service."
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> The Australian Centenary History of Defence: The Royal Australian Navy[1]

Introduction

This study has explored the assertion made in the epigraph to this chapter that the RAN changed because of the introduction of the DDGs. It has examined the impact of the Adams class DDGs on the RAN over the course of almost half a century and demonstrated their enduring legacy. The subject's historical importance derives from this being the first instance of the RAN acquiring a class of ships not built in either Britain or Australia using RN designs, modified or otherwise. The term 'impact' has been used broadly to permit a wide ranging investigation of changes of significance which took place in the RAN and can be attributed to the influence of the DDGs. The timeframe is appropriate because 1956 was the first occasion on which the professional head of the RAN took specific steps to canvas the option of acquiring USN warships and missile systems as a viable alternative to those of the RN, and because 2001 was when the last of the Adams class retired from RAN service.

As the DDGs entered service in 1965, the RAN was operating with British Commonwealth forces in South East Asia in resisting the spread of communism. They also arrived as the RAN was working through the political and public aftermath of losing *Voyager* in a collision with *Melbourne*, reintroducing a submarine service, modernising its Fleet Air Arm, and preparing for an increased involvement in Vietnam combat operations. These circumstances, amongst others, collectively left little time for the RAN's leadership to consider what broader changes the DDGs might imply for the RAN. The ships, their commanders and crews, had simply to fit

[1] Alastair Cooper. "1955-1972: The Era of Forward Defence." *The Australian Centenary History of Defence Volume III. The Royal Australian Navy.* Ed. David Stevens. Melbourne: Oxford University Press, 2001. 181-209. Page 192.

into an existing Navy that knew very little about them and was busy meeting its demanding commitments.

In overall terms, this has been a case study addressing the consequences of a major procurement decision, made at a political level, for an established medium power Navy with its professional standards, methods, traditions and culture firmly entrenched in the heritage of a different Navy.

In terms of Paul Kennedy's approach to viewing 'History from the Middle', the DDGs precipitated issues located between the most senior and junior echelons of the Navy. Those who operated the ships were largely left to their own initiatives and resources to find ways of getting the best from them, which the evidence shows they did.

This study has identified several major themes in terms of how the DDGs impacted on the RAN. It is the first study to conduct such a thematic analysis in examining the effect of a class of ships on the RAN, and it shows that the DDGs were catalysts for profound and enduring changes.

Choosing the DDGs – Australian Strategic Self-Interest

In January 1960, as CNS Burrell was preparing to conduct his overseas mission in search of options to regenerate the operational capability of the RAN, there were a number of serious issues to be confronted. In January 1959, the COSC had raised concerns about the threat posed by Indonesia and its acquisition of advanced Soviet naval and air force capabilities, and in February his predecessor, CNS Dowling, had lamented the RAN's lack of capability due to constrained government funding. In April that year, the Minister for the Navy, Senator Gorton, had informed the Minister for Defence, Mr Townley, that the Navy could not meet the Australian Government's expectations of it.

Notwithstanding the operational consequences, the cost of onward technological change in naval aviation, of which CNS Collins became aware in 1949, eventually led to the Government deciding in November 1959 that recapitalisation of the RAN's fixed wing Fleet Air Arm was unaffordable. *Melbourne* and its fighter aircraft would accordingly go out of service in 1963. Acquisition of a surface to air guided missile capable ship for the RAN then became a very high priority for fleet air defence, but this was in itself problematic because the RAN's logical choice, the Seaslug system of the RN, was known to have significant technical problems affecting its performance.

Overshadowing and constraining Burrell's options was Australia's 1957 policy of increasing its military standardisation with America, which also recognised that Britain could no longer be its guarantor of security. Australia's defence policy was being formulated more consciously in its own national strategic self-interest, and it was changing the direction in which the nation looked for assistance. Australia's enduring strategic relationship with America began with the highly favourable impression made by the USN's 'Great White Fleet' visit to Australia in 1908. That episode, Australia's subsequent experience of changed British strategic priorities, and the conduct of combined US-Australian campaigns in the Pacific War, all contributed to Australia having a greater sense of alignment with the US as its future guarantor of security. Implementation of policy could be expected to follow, from which the RAN was not exempt. In 1960 however, in a Navy that was then firmly built on RN traditions, concepts and capabilities, it was most unlikely that Burrell could have conceived of just how profoundly the RAN would eventually be redefined over the following four decades because of that policy shift: a shift first given prominent visibility by Australia's acquisition of the DDGs.

The Tartar missile system of the USN's new Adams class of guided missile destroyers was deemed by the RAN to be superior to Seaslug, but the RAN Staff Requirement for its guided missile ship also specified having a variable depth sonar, three helicopters and the Australian Ikara ASW system. The RAN was seeking a highly capable multi-purpose escort, no type of which existed in either the RN or USN in the form desired. The USN was asked for advice on modifying the Adams class, and the RN similarly concerning the County class, including its replacement of Seaslug with Tartar. The RN was unable to assist, but the USN went some way towards doing so. Regardless, the RAN's operational requirement could not be met by either of the world's two foremost navies, and a compromise had to be accepted.

The RAN was uninitiated in developing requirements for warships as advanced and complex as the DDGs. It had previously relied upon the RN for detailed advice in such matters, but this was not possible with the Adams class. At its most senior levels, the RAN did not appear to comprehend the technical challenges it was presenting to both the RN and USN in seeking to satisfy its preferences. Nor did it seem to appreciate the cost and other risks the RAN would incur through operating such advanced warships unique to Australia.

Although the RAN was aware of Seaslug's problems, when entering into contract for acquisition of the first two Adams class ships in October 1961 it was not aware that Tartar's

performance was also deemed to be unsatisfactory, which problem was not remedied by the USN until approximately the time that *Perth* was building in 1964/65. The RAN had in fact acquired a guided missile system without knowing about its operational and technical performance in detail. Although ultimately this would not be a deleterious gap, this demonstrates the RAN's limited expertise in such matters at this time. Improving the definition of operational requirements and project management methods became recognised as necessary by the RAN, but solutions took a protracted time to materialise.

The Australian Naval Board's attraction to Tartar included its potential for retro-fitting to the RAN's Darings, and for Tartar thus becoming the RAN's standard surface to air missile. In contrast, the Government's intention was to acquire American warships so that the RAN would be standardised with the USN, thereby demonstrably enhancing Australia's security relationship with the United States. Navy and government therefore had differing expectations, and earlier investigation by the Government of low cost and obsolete American naval ships and submarines having little operational value indicates that it may have been satisfied with less expensive and less capable ships had any existed. That Burrell had to argue to acquire two ships when just one was considered sufficient by Australia's Cabinet indicates its focus on cost and not capability.

With the Naval Board's familial leaning towards the RN, it proposed acquisition of the modified County class, but Minister Gorton had no such inclination and government policy direction was towards the US nevertheless. Australia's Government had no appetite to fund the changes to the Adams class contemplated by Burrell and were largely insensitive to his concerns. Such being its fiscal policies, Australia might have been prepared to forgo the acquisition entirely had not the US offered attractive financing arrangements, a factor due to America's self-interest being served. Burrell's political situation with the DDGs became one of 'take it or leave it', and in agreeing he accepted that the Adams class be acquired with only minor changes, with the Ikara system to be fitted in Australia. His memoirs, perhaps unsurprisingly, show that Burrell was happy with the outcome, but Gorton had the final say.

The most significant early impact of acquiring the DDGs was to give effect to Australia's political objective of using the RAN as an instrument of its foreign and defence policies in building a closer relationship with the United States. There was mutual self-interest involved for both countries in making the acquisition. The purchase of American DDGs represented a

watershed for the RAN and marked the end of Australia's buying British surface combatants. Correspondingly, it was a visible sign of the decline of its long standing and intimate - but occasionally subservient - relationship with its RN counterpart. Acquisition of the DDGs also presented the RAN with an unanticipated imperative to become more independent in their operation and support, the scale and complexity of which were also unappreciated at the time. Notwithstanding, the RAN's early steps with the DDGs promoted confidence in its own capabilities as its declining RN dependence transitioned to a different kind of relationship, nonetheless close and professional, with the USN.

Defence Policy and the RAN Adams Class

Acquisition of the Adams class marked the beginning of a progressive but substantial shift by the RAN towards the USN for acquisition of much of its force structure. In addition to FFGs, the RAN acquired USN fixed wing aircraft and helicopters, submarine combat systems and torpedoes, communications and electronic warfare systems, intelligence systems and guided weapons. Integration of these assets into the RAN initiated further changes to its administrative, operational, technical, logistical and training functions to make use of its new capabilities. Whilst some assistance was available from the USN, the fact that none of these things were of RN-origin meant that nothing of substance was available from that source, hence this transformation of the RAN was undertaken primarily through its own efforts. The 1957 government policy of achieving RAN standardisation, and thus interoperability, with the USN was writ large in this transformation, beginning with the DDGs. This process, however, unmasked the extent to which the RAN had benefited automatically via its RN heritage.

Purchase of the first two Perry class FFGs from the USN was approved in 1974 by a new Australian Government which cancelled the previously approved project for construction of an Australian designed light destroyer, known as the DDL. The Perry class had originally been rejected by the RAN as not meeting its requirements for a larger calibre gun or twin propellers, but these shortcomings were later deemed acceptable. The advantage of these ships lay in having a common surface to air missile and combat data system with the DDGs, and in carrying two large helicopters. Acquisition of a third FFG became part of election policy in 1977, and a fourth ship was chosen in 1980 to meet the political objective of supporting the United States as global security circumstances deteriorated. Announcement was made in 1983 of the building of the final two FFGs to maintain an adequate number of surface combatants for the RAN and achieve commonality with the existing four ships of the class.

Deciding which surface combatant to acquire for the RAN and how many was not a smooth process, and included reaction to emergent and deteriorating security circumstances in a largely unplanned manner. At the same time the choice aided the continuation of Australia's policy of working closely with its most important naval ally, first implemented through acquisition of the DDGs. Integration of the FFGs successfully into the RAN was significantly aided by knowledge of the USN's procedures and methods gained through its ownership of the DDGs, which gave insights as to what the RAN needed to do for itself with the newer ships.

Construction of eight Anzac frigates for the RAN was announced in the 1987 Defence White Paper. These would be acquired to replace the six RN-origin River class frigates with the (unfulfilled) intention of increasing the overall number of RAN surface combatants in service. The decision to construct the Anzacs indicated the RAN's sense of confidence that it could operate and maintain new ships while incorporating its own modifications into a German design. By then the remainder of its surface combatant force was predominantly of USN-origin, but it also operated RN-origin frigates and submarines. To become so independent in terms of selecting non-RN or USN-origin surface combatants can be seen as a sign of increased RAN self-awareness and appreciation of the risks and opportunities involved in the choices it was making.

From the 1976 Defence White Paper onwards there was an inconsistent approach to the evolution of the RAN surface combatant force, but arguably the RAN also exploited political opportunities as they arose. It took until the year 2000 for the RAN to produce its own formal body of maritime doctrine which comprehensively explained naval concepts and principles in Australian terms. In 1986 however, it had introduced Capability Tiers as a means of aiding understanding by others of how the RAN contributed to the Defence of Australia. Placing the DDGs and FFGs in the same Tier implied an equivalence of capability, although knowledgeable members of the RAN disagreed. To imply equivalence may not have been intended by the RAN, but such a framework contributed to a lack of urgency in replacing what the DDGs represented as they approached their end of life. Discontinuation of expensive and low benefit mid-life upgrades was decided upon by Defence in 1991, but a major modernisation program of the FFGs was initiated by the Government in 1994. The 1991 intention to replace the DDGs, and potentially the FFGs, with a derivative of the Anzac class was abandoned in 1999 because of technical risk and cost. The prolonged nature of that decision contributed to

creation of an extended gap in the RAN's surface combatant capability, which opened on departure of the last DDG in 2001.

Demise of the DDGs in the late 1990s had been forecast with accuracy in the 1986 Dibb Review and was cogently reinvoked in multiple policy statements afterwards. Dibb had also raised valid doubts as to their ongoing operational effectiveness in an era in which air threats were emerging that the DDGs were not capable of meeting, but those doubts were not properly addressed. In the absence of operational assistance from the USN, such as that received during the first Gulf War in 1991, any subsequent RAN operations which depended on the DDGs to counter a sophisticated air threat would have been at risk. Collectively, the evidence shows that the DDGs remained in service for about a decade too long.

Australia utilised the DDGs to help meet its foreign and defence policy objectives of supporting America in the Vietnam War during the late 1960s and early 1970s and in conducting operations in the North West Indian Ocean in the 1970s and 1980s and later in the first Gulf War. The ships were typically an integral element of the USN fighting force and not token gestures. In 1999 however, when Australia was leading a UN sanctioned multi-national force in overseeing the transition of East Timor from Indonesian rule to independence, only unmodified FFGs and Anzac frigates were assigned to the operation, and more capable air defence of the force was provided by the USN and RN. The ADF's force structure had been primarily developed for the Defence of Australia, which was shown to have been narrowly interpreted, and it lacked the capabilities it needed to meet government expectations when Australia's broader security interests were threatened in its immediate region.

Reflecting the lessons of East Timor, in the White Paper of 2000 Australia's Government acknowledged the need for the RAN to possess advanced organic air defence capabilities independent of land based aircraft. An intention was announced of replacing the six yet to be modernised FFGs after the year 2016 with three larger and more capable ships, known colloquially as Air Warfare Destroyers. Taking 15 years overall and four years longer than planned, the FFG modernisation was reduced from six to four ships to control costs. The forecasts by Defence in 1991 of mid-life modernisations of surface combatants not being cost effective and causing delays in operational availability were proven correct. Post-2017, three new DDGs of the Hobart class with its USN Aegis advanced combat system will become the

eventual successors to the RAN's nine USN-origin ships, continuing a lineage of advanced surface combatant capability first acquired through the Adams class DDGs.

Evolution of the RAN surface combatant force structure during the period examined here lacked a cohesive plan supported at the departmental and political levels. The time taken to acquire a class of modern surface combatants is typically much longer than several Australian Federal election cycles, which bring with them the potential for a change of government and direction, and the RAN was affected by this context. At government level, the three DDGs were acquired to meet key objectives of defence and foreign policies in support of the major ally. The subsequent acquisition of six FFGs in multiple stages over an extended period could be seen as politically opportunistic and ad-hoc. The reality of the situation was that the RAN had to grapple with ever present political constraints on Defence expenditure and, as the Navy saw it, an incomplete understanding of the resources and capabilities it needed to meet the contingencies that could arise. Achieving Australian Government understanding of the need for a long term perspective on the RAN proved elusive for most of the period under examination.

Although government comprehension of the contribution of surface combatants to Australia's national security was variable in depth of both interest and understanding, by the year 2000 a watershed had been reached. It can be discerned from the Government's adoption of a broader maritime strategy for the ADF that it was no longer content with the more narrowly defined path of the Defence of Australia policy with its demonstrated shortcomings. The capabilities of the DDGs were shown to be still essential. Through modernisation of the FFGs and acquisition of the Hobart class DDGs, the impact of the operational capability of the DDGs on the RAN and Australia's defence policy more broadly can be regarded as both significant and enduring.

DDGs and RAN Digital Combat Systems

Naval combat systems technology was changing rapidly even before the first RAN DDG was delivered. In 1960 the USN had already decided to fit NTDS widely across its fleet and had contemplated installation of a scaled down version during construction of the last of its own Adams class. Had this occurred, the RAN would potentially also have acquired NTDS because its DDGs were in that batch. USN policy however gave lower priority to the DDGs in the much larger USN order of battle and funding constraints prevented NTDS being fitted. The USN's

program was later revived with the intention of upgrading all of its Adams class with JPTDS, but only four were modified after funding cuts were again applied. When it acquired JPTDS, the RAN believed it was joining a much larger program than subsequently emerged, requiring it to become more self-reliant in supporting its ships than it had initially envisaged.

In 1975, 10 years after commissioning, *Perth* was in the US being fitted with JPTDS, which the RAN called NCDS. The USN regarded JPTDS as an inexpensive moderate operational upgrade of its Adams class, but to the RAN it was a major capability upgrade to ships that constituted its highest level of surface combatant capability. JPTDS was chosen by the RAN primarily to retain technical alignment with the USN's DDGs, but the operational limitations of the system did not become apparent to the Fleet staff of the RAN until *Perth*'s return to Australia. There was a mismatch of expectations and knowledge on the part of the RAN's operational and technical experts, and it emerged that the USN's performance requirement for JPTDS in terms of its operational characteristics was not known by the RAN in other than a general manner. The RAN had again acquired a USN capability on the basis of its confidence that the USN system would meet its operational requirements, and again, those requirements had only been expressed generally and in insufficient detail to define the full performance being sought. The RAN was once more fortunate that the performance required by the USN appeared to be largely satisfactory, but this demonstrates how in the mid-1970s the RAN was still building the knowledge and expertise it needed to become fully-rounded as a self-reliant Navy.

By the early 1970s, the potential for surprise attack from very high speed anti-ship missiles had caused the RN to change how it manned and organised the operations rooms from which its ships were fought. The RN PWO doctrine emerged in 1972 after operational tests to validate the concept. Such was its dependence upon the RN's Long Course training system for the advanced professional training of its seaman officers, the RAN then adopted the same doctrine. Digital combat systems subsequently installed in RN surface combatants were designed to support its revised PWO doctrine. Similarly, JPTDS had been designed to match USN fleet doctrine of the mid-to-late-1960s, which envisaged its DDGs in a carrier battle group and working with more powerfully armed ships. Consequently, the RAN had to superimpose its new RN fighting doctrine for PWOs on a USN designed combat system that did not embody such a philosophy. The situation led to the RAN's development of software and procedural changes to best meet its needs in fighting the DDGs, a process that required improvisation and

compromise to achieve adequate results, which results were of themselves an indication of the RAN's growing ability to meet its own requirements.

The original RAN aspiration of evolving NCDS into a fully-fledged combat data system for the DDGs which included ASW capabilities was never achieved. Integration of the increasingly important electronic warfare capabilities of the ships remained inefficient through to the end of their service lives, constraining the RAN in improving its expertise in that field. Comprehensive integration of its 1972 initiated PWO doctrine with the combat systems and operations room design of its surface combatants was not achieved by the RAN until modernisation of its Anzac frigates *circa* 2013.

The independence achieved by the RAN's submarine arm in managing the digital combat system for its modernised Oberon class could not be replicated by its surface warfare counterparts, but that self-sufficiency did not extend onward to the later Collins class submarines. The relatively small collection of combat systems in the RAN's surface combatants and submarines, combined with their lack of commonality and uniqueness to the RAN, may have deterred further investment at that time by either the RAN or commercial interests in creating an indigenous Australian capability. Without such industrial capability or a more stringent acquisition policy framework, the RAN was inevitably in the position of acquiring systems designed, developed and supported by others.

DDG training equipment was introduced into the RAN as part of the NCDS project, but as an efficiency measure it was a shared resource for technical and operational personnel and located in Canberra, well away from the primary RAN operational training centre at HMAS *Watson* in Sydney. Shore based operational training equipment had not been adequately provided when the DDGs were originally acquired, and officers and sailors largely did their training in the ships themselves. It took until almost the end of the ships' service lives for NCDS training equipment that matched the configuration of the DDGs to be provided at *Watson*. Thus, for its most important surface combatants, the RAN took a long time to align its shore based training for operational personnel with its seagoing capabilities and requirements, thereby incurring risks to its operational proficiency. The paucity of equipment and its lack of collocation with other operational training also inhibited the testing of tactical innovation by the RAN in improving its use of the DDGs.

In September 1985, *Brisbane* became the first DDG to commence the second significant modification program. Its purpose was to ensure the ships could retain their operational capability and be technically supported until their end of service. *Brisbane*'s post-modernisation acceptance committee appointed by CNS Hudson found that the statement of requirements lacked the detail needed for preparation of a satisfactory test and evaluation plan. Consequently, the technical performance delivered by the ship could not be evaluated against an operational requirement, opening up the possibility for a capability gap to go undetected.

The changing nature of the air threat required in turn more capable surface to air missiles, and in the mid-1970s the USN commenced replacing its obsolescent SM-1 missiles with SM-2. Although SM-2 could be adapted to the SM-1 missile magazine and launcher of the DDGs, as was subsequently done for the RAN's FFGs, the second modernisation of the DDGs did not implement that change. The DDGs remained equipped with an inferior missile system from 1985 until leaving service about 15 years later. Further unplanned modifications to *Brisbane* were required to equip it for defence against anti-ship missiles before it was able to deploy in 1990 for the first Gulf War, only two years after its modernisation was completed.

The USN made frequent and significant changes to its original NTDS capabilities but the RAN was unable to benefit materially from them in an extensive way, although new data links and USN operating concepts were adopted. The ships of the Adams class were physically too small to accommodate the evolving USN combat systems and their associated technical infrastructure. For the USN, the rapid transformation of multiple naval technologies meant that the service life of their Adams class was curtailed through premature obsolescence, and they were all removed by 1993. It is possible that the RAN understood these issues because questions of DDG capability limitations were highlighted in the 1986 Dibb Review of Defence Capabilities. Regardless, they demonstrate that by the mid-1980s, the RAN and the Department of Defence more broadly had not yet introduced effective long range planning to manage the inevitable withdrawal from service of a major naval capability, or to match RAN capabilities to the threat environment.

The different degree of importance allotted to JPTDS by the USN meant that the RAN had to develop its own capabilities to support its DDGs, but a medium term benefit for the RAN was that a modified JPTDS was fitted to its Perry class FFGs. This circumstance enabled the RAN to

derive commonality efficiencies from NCDS software and hardware in both its DDGs and FFGs for a considerable period of time and, importantly, achieve a high degree of interoperability between those units of the RAN as well as with the USN. Full realisation of digital interoperability between all surface combatants of the RAN was prevented by not including such a requirement in the expensive life-extension program for four of its six RN-origin River class frigates, a program which had been authorised at the same time as RAN acquisition of NCDS. The original RAN intention of achieving some cohesion across its submarine and surface combatant forces through the mutual adoption of NCDS was attractive in theory, but proved to be technically unachievable.

With the RAN lacking a clear strategy to build incrementally upon its core combat data system, NCDS ultimately had no long term future. Through introduction of the Anzac frigate in the mid-1990s, the RAN acquired a Swedish combat data system, and in modernising its FFGs the RAN adapted NCDS into ADACS, a different system. The RAN's financial investment in NCDS equipment and software became a largely fruitless endeavour, but the organisational expertise generated through its development and support was highly valuable in its own right. Overall, introduction of NCDS through the DDGs made a highly significant contribution to building the RAN's knowledge and understanding of the capabilities needed in its surface combatants in the future. In that sense, the DDGs were important catalysts in the RAN's progress towards self-reliance in operating and managing advanced combat systems.

Operating the DDGs – People Factors

This study has considered 'people' factors associated with operating the DDGs in two stages. Firstly, an examination was made of the impact of the DDGs through the testimonies, experiences and beliefs of those who had to operate, maintain, and support the ships - and make them work. These people had to devise practical solutions to realise the intention of the government and leadership of the RAN and introduce the DDGs into service. This was an example of Kennedy's contention that individuals in the middle of an organisation have to turn strategic decisions into practical success. An examination then followed of the importance of the DDGs in the development of the senior leadership of the RAN, and of the influence these senior officers had upon the future of the whole Navy through their responsibilities and authority. These latter findings incorporated experiences of several officers who commissioned the DDGs, all of whom had been trained in the standard RN methods and practices adopted by the RAN, and who reached star rank during an era in which great change

took place in the Navy. This study thus provides a new perspective on the RAN officer corps during the period concerned.

From their first arrival, the DDGs were regarded as the RAN's major surface combatants. The DDGs were not unimportant to the USN, but were far less so in its much broader spectrum of warships. The experience and seniority of officers serving in RAN DDGs was typically higher than those of their USN counterparts, and their expertise was highly regarded by their US allies. Between 1967 and 1972, eight rotational deployments to Vietnam of approximately six months' duration were conducted by the three DDGs, with a single deployment undertaken by a Daring class destroyer. Conducting operations with the US 7th Fleet served to develop skills and experience and, importantly, to learn lessons at both the individual and organisational levels only possible in warlike circumstances. It also helped create a reservoir of RAN knowledge needed nearly 20 years later in the first Gulf War. Conversely, the Vietnam commitment delayed integration of the DDGs into the broader RAN. The DDGs were highly regarded as fighting ships by their crews, even though their accommodation was cramped and they were uncomfortable in heavy weather.

When they were acquired, the RAN applied its RN concepts in terms of how it would logistically support the ships. The USN method was substantially different and inadequate provision for logistical support of the RAN DDGs was the case from the outset. The problem was compounded through being masked by operations in Vietnam where the ships were integrated into the USN support system, but officers who underwent that experience realised how much more effective the USN logistical support systems were than those of the RN, and they later contributed to their introduction and adaptation by the RAN. Through not making adequate logistical support arrangements, within only a few years of their delivery the Navy lost control of the configuration of its newest and most modern ships. The remedy involved a new funding agreement with the USN, but it facilitated adoption of new and modern support concepts by the RAN.

Officers posted to commission the DDGs were selected from the pool of RAN officers available, and the subsequent success of many as their careers advanced implies that they were chosen carefully. Notwithstanding, their selection for commissioning the ships was aided by the good fortune of being available and qualified to serve in a DDG, and their careers were further

assisted by their personal participation in the rise of the DDGs as the professional benchmark for the Navy.

Officers who became experienced in DDGs tended to serve in them on multiple occasions, constituting further utilisation of their training and experience and providing opportunity to improve their professional skills. Consistent exposure of officers of all Branches to the highest professional standards of the seagoing RAN contributed to those officers developing their own expertise in an environment in which such standards were regarded as the norm. Service at high rank in a DDG was not a guarantee of promotion to star rank, but over time 80% of Commanding Officers (as characterised in this study) reached the rank of commodore. WEEO(s) and Supply Officer DDG Heads of Department were also more likely than non-DDG Qualified officers to reach the star ranks of the RAN, with 80% of officers from those Branches promoted to rear admiral having had DDG service. The MEO cohort was underrepresented at star rank, which can be assumed to be the consequence of a number them being former senior sailors, chosen to offset a shortage of qualified officers. Their expertise helped keep the DDGs operational, but they were unable to gain the breadth of experience necessary to achieve high rank.

From 1976 to 1998, 71% of all seaman, engineering and supply officers reaching the rank of rear admiral had the notable common career characteristic of service in a DDG, giving the ships a place of prominence in shaping the future leaders of the Navy. From that time, and indicating that the DDG effect was waning, the cohort of non-DDG Qualified officers to reach that rank became ascendant.

The success of officers serving in DDGs in meeting their responsibilities was achieved not only through their own efforts but to a large extent by the sailors whom they led. Collectively they formed the crews of the ships. The ships were new and foreign to both of the Navy's essential human constituencies. They introduced a uniquely all-Australian naval working environment in which it was essential for all to respect and trust each other to succeed. A sense can be gained that the DDG environment, being so different from that of ships of RN-origin in which RN methods and attitudes were likely to be manifested, gave opportunities for officers and sailors of the RAN to build a cultural bridge which spanned the gap which Sears and Spurling consider existed in the previous generation. In this way, the psychological interaction between

the officers and sailors, and between them and their DDGs, fostered further Australianisation of the culture of the RAN.

From 1955 to 1982, with one exception, leadership of the RAN was provided by an officer who had commanded an aircraft carrier, and from 1982 to 2008, with one exception, the RAN was commanded by an officer who had commanded a DDG. From 1982 to 1999, 8 of 10 officers who reached the rank of vice admiral were DDG Qualified, with two more post-1999. That the individual leadership of the RAN for just over 25 years was provided by officers who had commanded a ship with USN methods and practices, and who then overlayed those experiences upon those originating in the RN, meant that the culture of the RAN would inevitably change over time. That cultural evolution was towards becoming less British, but it had no potential to become American to the same degree. From about the mid-1950s, the gradual cultural evolution of its junior and mid-ranking officers moved the RAN towards alignment with Australia's wider societal character and helped move it closer to the Australian Army and the RAAF as being authentically Australian in both character and name.

Those who operated, maintained and supported, or were closely associated with the DDGs perceived change taking place in the RAN. They sensed the RAN departing from its past because the DDGs required them to use their own intellects and energies to get the best out of the ships; there was no RN fall-back or safety net. The evolving RAN relationships with both the RN and USN required RAN officers and others in support to have the clarity of purpose and acceptance of accountability associated with ultimate ownership of outcomes. Changes brought about in the RAN because of the presence of the DDGs were seen by some as likely to have occurred regardless, but most saw the ships as major catalysts for change that the RAN needed to make for its own sake to become more self-reliant.

For a considerable period of time, the RAN operated surface combatants in what could be regarded as two separate sub-navies. They comprised the declining numbers of RN-origin ships of the Daring and River classes, and the increasing numbers of USN-origin ships of the Adams and then Perry classes. The logistical support and maintenance requirements of each group were different, but eventually the methods used by both the RN and USN became integrated into how the RAN maintained and supported itself. Such was its learning gained through operating the DDGs and exposure to the USN, that the Supply Branch of the RAN

progressively re-invented itself to adopt or adapt various modern methods based on those of the USN: a consequence of great importance to the future of the RAN.

Operating the DDGs provided the RAN with its first experience of how the USN, as successor to the RN as the most powerful navy in the world, was operated, maintained and supported. The DDGs encouraged a reorientation of the RAN away from its former RN patriarch towards the USN, but on a more equal footing. On that journey, the RAN learned much about what it meant to be a Navy, as opposed to a Fleet, but fully capitalising on that knowledge proved to be difficult, particularly in regard to engineering matters. The profound depth of organisational and other substantial change across the Department of Defence that took place throughout the service lives of the DDGs inevitably impacted on the RAN. Australia's industrial infrastructure and the deeper technical expertise needed by the Navy had previously been largely provided by government-owned dockyards managed by the RAN. When subsequently privatised however, they took on a commercial character and were no longer within Navy's direct influence. Neither the decision to build the Anzac frigates nor other naval projects intended to deliver the operational capability of the RAN addressed holistically the broader and longer term naval industrial and technical infrastructure issues and skills which were needed in Australia.

Since their arrival in the mid-1960s, ownership of the DDGs had been progressively demonstrating that a greater depth of national capability was in fact necessary for the RAN to be self-reliant as a Navy, but such understanding was not uniformly shared by those in senior official positions of responsibility. Hence the implementation of a series of wide ranging organisational changes by Defence led to progressive dilution of relevant technical expertise in both the Navy and Australian industry. Eventually that erosion contributed to severe consequences for the RAN in terms of early removal of major ships from operational service. Deeper consideration of this experience revealed that replacement of lost national infrastructure and skills was essential for Australia if it were to have a Navy which met its own needs.

The DDGs entered service as the RAN's most senior leadership was acknowledging that the Navy's cultural affinity with the RN needed to change and become more recognisably Australian. The mid-to senior ranking officers who manned the ships throughout their time in service represented an important element of the RAN's investment in its future. They built

their intellectual capital in the DDG environment and would, in their later careers, largely determine the destiny of the Navy. The commanders and leaders of the DDGs therefore ultimately had a considerable impact on the RAN through nurturing its professional development, and making it increasingly self-reliant and distinctly Australian in behaviour, in all of which dimensions their legacy now resides.

Other Factors Potentially Contributing to Change

The degree to which the DDGs impacted on the RAN can be further estimated through speculating how other factors might have resulted in similar outcomes without their presence. Would the strategic relationship attained by the RAN with the USN have similarly emerged? Such relationships are formed through common interests and mutual benefits, but confidence in the professional competence of the other is an essential prerequisite. The RAN's relationship with the USN became more strategic in 1956 when CNS Dowling raised the question of acquiring guided missile ships with CNO Burke. DDG operations in Vietnam placed the two navies in close proximity and gave shared experiences not possible in non-warlike circumstances. Without an RN presence, the RAN was clearly Australia's Navy. In the US 7th Fleet, the USN's and RAN's DDGs were almost indistinguishable and used interchangeably, and the RAN ships were occasionally given senior responsibilities. The relationship which emerged and which has endured would not reasonably have been possible to the same degree and would not have formed as quickly as it did without the mutual experience of shared adversity in Vietnam. That familiarity may well have helped ease concerns amongst the RAN leadership about making the eventual separation from the RN, but ultimately it led to the deep, but more equal professional relationship with the USN. In providing the first non-USN Flag rank commander of a RIMPAC exercise, amongst the world's largest and most advanced, the RAN was acknowledged by the USN as having reached a significant professional threshold. Such recognition and confidence originated in the USN's first-hand experience with the RAN in Vietnam operations, and almost certainly it would not have emerged without the presence of the RAN's DDGs in that theatre.

A further question relates to whether formation of a more equal relationship with the RN would have occurred regardless of the presence of the DDGs. The era was one in which the RN was declining as a major naval power and the USN was its successor. Australia itself was undergoing political realignment away from Britain towards the United States, and Australian society was becoming less British and more American in its outlook and culture. Further, as we

have seen, the RAN's senior leadership had realised that it needed to become more Australian in character, a process which took time to accomplish. Collectively, the changing mix of the RAN's order of battle, Australia's increased focus on its own strategic interests as the Cold War progressed and its closer relationship with the US, and the declining relevance of the RN, all gave the RAN little option but to become more self-reliant to meet the needs of its own country. The RN also had its own challenges of retaining its relationships with the USN and NATO, and British defence policies gave it less reason to be involved in Australia's region. These factors suggest that change in RAN-RN relations would therefore have come to some degree regardless. But had the DDGs not been present in the RAN or had it acquired the County class, the impetus for it to adjust its relationship with the RN would have been much less pressing. In that circumstance, it is possible that Australia's changed political alignment towards the US could have left the RAN with an ambiguous and uncertain sense of its own identity. Hence there is nothing to suggest the RAN would have come to be regarded as less junior or more equal by the RN had it not increased its own self-reliance through acquiring the DDGs.

Changing the RAN's flag of allegiance in 1967 was of fundamental importance to a Service which incorporated symbolism and tradition deeply into its ethos. That step can be regarded as another visible sign of breaking from its RN heritage. In not asking approval of the RN, the leadership of the RAN in 1967 revealed that it felt largely autonomous of the RN and considered the time had come to be seen as unequivocally Australian. Their assessment however belied the difficult journey of evolution still needed for the RAN to gain the autonomy rooted in real self-reliance. The hoisting of the RAN's new ensign could have been expected to convey to all its members and others that some form of change to its identity was taking place quite independently of the DDGs. Notwithstanding, the new ensign being flown in combat operations for the first time on an RAN warship acquired from America, not Britain, commenced a new era in which RAN ships earned their battle honours under Australia's own white ensign. The new ensign would almost certainly have contributed to a greater sense of RAN self-identity, but there is credibility in suggesting this was hastened and enhanced through its being worn by the DDGs and other RAN units on Vietnam operations.

Multiple factors were impacting on the future of the RAN over the period in question, but its evolution toward greater self-reliance was aided considerably through a major organisational

focus on operation of the DDGs. That focus during Vietnam operations and after the demise of *Melbourne* served particularly to crystallise that change. While it can be imagined that some change would have occurred in the RAN without the presence of the DDGs, we may confidently say that it would probably not have taken place at the same speed, or to the same extent, or in the same way.

The Impact of the DDGs on the RAN: *circa* 1956 to 2001

This study has found that there were several significant consequences for the RAN that flowed directly from the presence of the DDGs. The most important short term but enduring impact was to give immediate effect to Australia's policy of achieving full interoperability with the USN through standardisation of those ships with their USN equivalents, and of building a stronger relationship with its major ally. The longer term consequence, of major impact on the RAN, was that the DDGs acted as a catalyst for substantial change across the entire Navy. They entered service as its junior to middle-ranking and some of its most senior officers were sensing the need for change. Because the ships were so different and needed the support of the entire naval organisation to operate them successfully, they became important vehicles for pursuit of that evolution. Their presence also represented Australia's first visible step towards its naval force structure transition from British to American capabilities, taken because of Australia's self-interest in its security alignment with the United States in the face of national concern about Indonesian intentions. Australia's mutual interests and its security cooperation with its most powerful friend and ally brought goodwill in the form of access to advanced technology and knowledge, as well as resource benefits.

The consequence, largely initiated because of acquiring the DDGs, was that the RAN's dependence upon the RN in deeper professional matters had to give way to professional competence to meet its own needs and those of Australia's Government. This outcome would not have been as well served, nor as extensive, had Australia instead acquired the RN County class destroyer fitted with the USN Tartar missile system, as had originally been preferred by the RAN. The operation and support of such a uniquely Australian warship would have been highly expensive and difficult, and probably beyond the RAN's capabilities. Such a failure would almost certainly have seriously undermined the Australian Government's confidence in its Navy.

Australia's decision to diverge from Britain in acquiring a major surface combatant, and therefore to adjust its linkage to the RN, became one of great significance for a Navy whose origins and culture were firmly British by design, and an examination of the consequences of that decision contributes to an improved understanding of the evolution of the modern RAN. Introduction of a new class of warship is important to a Navy because it offers the opportunity of improving its operational capabilities while modernising other elements of the Service to maximise the wider potential benefits. In the case of the RAN, the DDGs were of particular significance because of their centrality as the most capable surface combatants within its order of battle.

Working against exploiting opportunities presented by acquisition of the DDGs was the nature of the RAN's senior leadership, which was highly conservative and for the most part did not encourage change. The RAN's evolution was similarly not helped by a lack of government understanding of what it wanted from its Navy, a situation temporarily ameliorated by the abilities of Senator Gorton, the Minister who effectively shaped the bulk of the RAN's force structure over the next 25 years. Examination of the impact of the DDGs thus constitutes a substantial historical study of the interaction of change and continuity – in this case in the context of the RAN's role as a primary instrument of Australia's national power.

Although in service for almost a decade too long, the operational capabilities of the DDGs, introduced in the mid-1960s, largely remained relevant to the RAN until their final withdrawal from service in 2001. Introduction of the Hobart class DDGs after 2016, with their USN Aegis combat system and current version of the USN Standard missile, testifies to the enduring relevance of those capabilities originally represented by the Adams class. A broader legacy endures in the knowledge and expertise gained by the RAN in terms of the air defence, digital combat systems and logistical support concepts it adopted and adapted, which all owe their presence to acquisition of the DDGs. The Government's initial objective of interoperability with the USN was given full effect by the near total conversion of the RAN's major capabilities to American equipment through an evolution that began with the DDGs.

Commanding Officers of DDGs commanded task groups and the performance of their crews became the benchmark for RAN professional standards. DDGs were the common career point for many of the RAN's most senior leaders who collectively shaped the culture of the entire Navy as it went through a long period of considerable change. The DDGs were primary

catalysts for change in the RAN, but more broadly they contributed to shaping the ADF approach to logistics, maritime command and control, combat systems interoperability, and maritime air defence.

The future of the RAN was therefore profoundly changed by a political decision in November 1960 to acquire two DDGs, and later a third. While acting in pursuit of Australia's self-interest, the Government had no cause to believe that its decision was not welcomed by the RAN, or was beyond its capability. Neither the Government nor the leadership of the RAN at that time comprehended how technically advanced the ships were, and how different their support requirements would be. Nor did they comprehend that their complete incompatibility with an existing RN-origin fleet would precipitate the large scale change that followed in almost every facet of how the RAN conducted itself. In making that change, the RAN wrestled with the challenge of becoming a far more independent Navy than it had ever contemplated when the ships entered service.

For nearly 36 years the DDGs gave naval options to Australia's political decision-makers during cold war, limited war and peace. In serving the RAN for almost 40% of its history and during a time of great change for the Navy, the Department of Defence, and Australia alike, the DDGs were important vehicles in facilitating transition of the RAN from a post-colonial world towards being an effective instrument of Australian Government policy. The Adams class DDGs empowered the RAN in developing a much greater understanding of what it means, and what had to be done, to become a distinctly Australian and self-reliant medium power Navy.

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Bibliography

Notes Concerning the Bibliography

The bibliography has been compiled utilising the RefWorks bibliographic management software hosted through the library of UNSW Canberra. The style used is Chicago 16th Edition (Notes and Bibliography) with minor modification for presentation purposes.

Details concerning the use and management of non-public sources are contained in Appendix J.

The bibliography is structured as follows:

A. PRIMARY SOURCES

I Archival

II Printed

III Oral

Sub-sections have been included to distinguish sources where appropriate.

B. SECONDARY SOURCES

I Published

II Unpublished

A. PRIMARY SOURCES

I Archival

National Archives of Australia[1]

Prime Ministerial Records

M2576,51, Personal Papers of Prime Minister Menzies: Haul Down Report by Vice Admiral Sir Hastings Harrington [Includes Comments by Alan McNicoll and Secretary, Department of the Navy, and Correspondence from Hon F C Chaney Re Skyhawk Aircraft].

A4944, Volume 2, Fifth, Sixth & Seventh (First Series) Menzies Ministries - - Summary of Decisions made at Ministry and Full Cabinet Meetings (22 July 1954 - 19 December 1961).

A4943, Volume 8, Seventh Menzies Ministry Cabinet Decisions Nos 701-1,000 -1963-1963.

A5822, Volume 1, Seventh Menzies (Second Series), Eighth Menzies, First and Second Holt, and McEwen Ministries - Register of Chronology of Meetings of Cabinet and Cabinet Committees - Chronology of Meetings 1962 - 1967

[1] All documents are from the National Archives of Australia and use its titles. The prefix of NAA is applicable to each series shown but omitted here. Specific topics and dates within sources are provided with the associated footnote in the thesis and appendices.

Cabinet Records

A4926,611, Procedure for Control of Costs of Naval Ship Construction and Conversion Programme - Decision 792.

A5818,Volume 17/Agendum 733, United States Navy VLF Radio Broadcast in Australia Decision 894. A5841,329, Acquisition of a Fourth CHARLES F. ADAMS Destroyer (DDG) [Guided Missile Destroyer] for the RAN. Decision 366(M).

A5819,Volume 13/Agendum 519, Navy Programme Proposals. Decision 622.

A5827,Volume 7/Agendum 213, Project Ikara. Decision 261.

A5908,703, Modernisation of Royal Australian Navy's DDGs - Decision 1091(AD HOC).

A5909, Ad Hoc Committee - Cabinet Minute - New Australian Naval Destroyer Proposal - Submission 702.

A5915,382, DDG Sonar Update: Cabinet Minute (Decision 1082).

A5915,1005, New Destroyer Project - Decision 2185.

A13977,1025, Cabinet Submission 1025 - Helicopters for Navy's Frigates (FFG) - Decisions 4371, 4390/DER(Amended) and 4462.

A13977,412, Cabinet Submission 412 - A Proposal to Build Two FFG-Class Frigates at Williamstown Naval Dockyard - Decisions 2200/INF(Amended), 2231/ER and 2279 (Amended)

Minutes of the Australian Naval Board

A2585,1954 – 1960: Naval Board Minutes, 1954-1960

A2585,1961 - 1964: Naval Board Minutes, 1961 - 1964.

A2585,1965 (1-96/65): Naval Board Minutes 1965.

A2585,(1-57/66): Naval Board Minutes, 1966.

A2585,86-93/68. Naval Board Minutes to 16 August 1968.

Australian Government Departmental Files

A1209,1967/7451, Haul Down Report of Chief of Naval Staff: Vice Admiral Sir W H Harrington February 1965.

A1945,84/3/4 Part 1, Navy Program Proposals 1960.

A1945,84/3/4 ATTACHMENT B, Navy Program Proposals July 1960.

A3092,221/4/9/7/1, US Naval Vessels for Australia.

A3092,221/4/9/7/2, US Destroyers for Australia (Charles F. Adams Class).

A4639,151, Naval Construction in Australia for RAN - Anti-Submarine Frigate Programme.

A5799,21/1963, Procurement of 'Seacat' Missiles.

A5799,6/1962, Project Ikara - Progress Report for Period 1st January - 30 June 1961.

A5799,23/1962, Project Ikara - Progress Report.

A5954,64/11, Personal Correspondence, Vice-Admiral A.W.R. McNicoll.

A5954,59/19, Personal Correspondence, Vice-Admiral Sir Henry Burrell, RAN, Deputy Chief of Naval Staff.

A7942,D114 PART 2B, Three Year Naval Defence Program - 1962-1963 to 1964-1965.

A8447,67/1960, Navy Program of July 1960.

Australian War Memorial

AWM 78-292-1 to 12 Reports of Proceedings HMAS Perth 1965 - 1977.

AWM 78-70-1 to 10 Reports of Proceedings HMAS Brisbane 1967 - 1977.

Australian Department of Defence Archives[2]

Commonwealth of Australia*. Australian Consulate General New York Purchase Order for 2 DDG 2 Class Destroyers. Dated 26 October, 1961 (SPC.DS.9)* Navy File 1215-201-76 Canberra : Sea Power Centre Australia.

Department of Defence (Australia)*. Naval Combat Data System Evaluation Report and Financial Statement Volume 2 - RAN Combat Data System - (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 116) (SPC.DS.47.1)* Paper: NCDS/28 April 1971 Salisbury South Australia : Department of Supply Weapons Research Establishment Salisbury; Sea Power Centre Australia.

Hughes Aircraft Company*. Proposal for a DDG Tactical Data System for the Royal Australian Navy. Dated 31 August 1970. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 123) (SPC.DS.50.1)* 70D/C2620 Canberra : Sea Power Centre Australia.

Royal Australian Navy. *ABR 5016 - Regulations and Instructions for the Royal Australian Navy (SPC.DS.54)*. Canberra: Royal Australian Navy, 1976.

———. *ABR 5245 - Royal Australian Navy Integrated Logistic Support Manual (SPC.DS.55)*. Canberra: Sea Power Centre Australia, 1979.

———. *ABR 5287 - Royal Australian Navy Logistics Planning Data Manual - HMA Ships and Establishments (SPC.DS.56)*. Canberra: Sea Power Centre Australia, 1996.

———. *ABR 5296 - DDG Follow on Support Manual (SPC.DS.28)*. Canberra: Sea Power Centre Australia, 1978.

———. *ABR 5476 - Shipboard NBCD Organisation, Damage Control, Firefighting and General Information (SPC.DS.57)*. Canberra: Sea Power Centre Australia, 1992.

———. . *Accidental Attack on HMAS Hobart by US Aircraft in Vietnam Waters (SPC.DS.20)* Navy File 68/1381 Canberra : Sea Power Centre Australia., 1968.

———. . *DDG NCDS Update - Factors and Installation Schedule. Dated 15 March 1973. (SPC.DS.17.1)* Navy File 1215/51/405 Canberra : Sea Power Centre Australia.

———. . *Gloucester Cup Winners 1947-2011. Dated 2013. (SPC.DS.24)* Canberra : Sea Power Centre Australia.

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[2] This heading includes all archival material obtained from the Department of Defence Archives and the Sea Power Centre Australia, as well as official RAN correspondence obtained from other sources. All entries with the nomenclature of SPC.DS.Num are available at the Sea Power Centre Australia. Appendix J separately gives details of those documents.

———. . *Guide to the Modernised RAN DDG. Dated 1 July 1988. (SPC.DS.21.1)* Canberra : Sea Power Centre Australia.

———. . *Haul Down Report of Chief of Naval Staff & Chief of Navy: Vice Admiral R.G. Taylor RAN. Dated 30 June 1997. (SPC.DS.39.1)* Canberra : Sea Power Centre Australia.

———. . *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1)* Canberra : Sea Power Centre Australia.

———. . *Haul Down Report of Chief of Navy: Vice Admiral C.A. Ritchie RAN. Dated 3 July 2000. (SPC.DS.41.1)* Canberra : Sea Power Centre Australia.

———. . *Haul Down Report of Flag Officer Commanding HMA Fleet: Rear Admiral W. Dovers RAN. Dated 22 January 1973. (SPC.DS.38.1)* Navy File 1/26/10 Canberra : Sea Power Centre Australia.

———. . *His Royal Highness the Duke of Gloucester Cup Awards (SPC.DS.23)* Commonwealth Navy Order 654/54 Canberra : Sea Power Centre Australia., 1954.

———. . *HMAS BRISBANE - Acceptance Board Report at Acceptance into Service (Report by Chairman of Acceptance Board). Dated 10 October 1988. (SPC.DS.12.1)* Navy File 18-12-55 Canberra : Sea Power Centre Australia.

———. . *HMAS BRISBANE Reports of Proceedings, January to December 1990 (SPC.DS.58)* Canberra : Sea Power Centre Australia., 1990.

———. . *HMAS BRISBANE Reports of Proceedings, January to December 1991 (SPC.DS.59.1)* Canberra : Sea Power Centre Australia.

———. . *Minute CNS to DCNS & 3NM: Charles F. Adams - Finalisation of Requirements. Dated 23 March 1961. (SPC.DS.7)* Canberra : Sea Power Centre Australia.

———. . *Minute CNS to Minister on Decision to Purchase Two DDG. Dated 29 June 1961. (SPC.DS.8)* Canberra : Sea Power Centre Australia.

———. . *Minute CNS to Minister: Construction of DDG and ASW Capabilities. Dated 23 may 1961. (SPC.DS.1)* Canberra : Sea Power Centre Australia.

———. . *Minute CNS to Secretary Department of Defence concerning S.A.G.W. Escorts. Dated 30 August 1961. (SPC.DS.25)* Navy File 1217/201/76 Canberra : Sea Power Centre of Australia.

———. . *Minute DCNS to CNS: Examination of Helicopter Types for Charles F. Adams. Dated 20 April 1961. (SPC.DS.5)* Canberra : Sea Power Centre Australia.

———. . *Minute DNSP 66/89: RAN DDG Modernization Project Re-Engining of DDGs and Other Enhancements. Dated 4 July 1989. (SPC.DS.62.1)* Navy File 89-23629 Part 1 Canberra : Sea Power Centre Australia.

———. . *Minute RAN Director of Weapons to CNTS: Implications of the Acquisition of the US DDGs of the Charles F. Adams Class for the RAN. Dated 20 December 1960. (SPC.DS.13)* Navy File 211/207/3 Canberra : Sea Power Centre Australia.

———. . *Minute by 3NM: Helicopter Facilities - Charles F. Adams (3NM Suggestions). Dated 21 March 1961. (SPC.DS.6)* Navy File 1211/207/4 Canberra : Sea Power Centre Australia.

———. . *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1)* 1626/204/415 Canberra : Sea Power Centre Australia.

———. . *Project 1230 - DDG Modernization (Equipment Acquisition Strategy). Dated 19 February 1988. (SPC.DS.63.1)* Navy File 91-28893 Pt 1 Canberra : Sea Power Centre Australia.

———. . *Project Directive no 63 - Naval Combat Data System. Dated 29 may 1973. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 104) (SPC.DS.46.1)* Navy File 1626/204/415 (N) Canberra : Sea Power Centre Australia.

———. . *RAN DDG Modernisation Project - ECP 141 Senior/Junior Sailors Mixed Gender Accommodation - HMAS HOBART. HMAS HOBART Letter Dated 15 may 1991. (SPC.DS.60)* Navy File 91-12103 Part 1 Canberra : Sea Power Centre Australia.

———. . *RAN DDG Modernisation Project - Re-Engining of DDGs and Other Enhancements: Naval Engineering Services Branch: DDG Helicopter Feasibility Study 23 may 1991 - Navy File 89-23269 Pt 1(SPC.DS.61.1)* Canberra : Sea Power Centre Australia.

———. . *Reports of Proceedings HMAS HOBART. Dated June 1968. (SPC.DS.53.1)* Canberra : Sea Power Centre Australia.

———. . *Reports of Proceedings, HMAS BRISBANE (1978 - 2001)* Canberra : Sea Power Centre Australia.

———. . *Reports of Proceedings, HMAS HOBART (1978 - 2000)* Canberra : Sea Power Centre Australia., 1978 - 2000.

———. . *Reports of Proceedings, HMAS PERTH (1978 - 1999)* Canberra : Sea Power Centre Australia.

———. . *Responsibility and Accountability of the NCDS PD. Dated 6 November 1975. (SPC.DS.48)* Canberra : Sea Power Centre Australia.

———. . *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1)* A.F. 5/3/94 Canberra : Sea Power Centre Australia.

———. . *Vice Admiral Sir Roy Dowling RAN - Brief Report on Relinquishing the Post of First Naval Member and Chief of Naval Staff. Dated 23 February 1959. (SPC.DS.36.1)* Canberra : Sea Power Centre Australia.

United States Navy. *USS Robison (DDG-12) CIC Standing Operating Procedures - OPINST P05400.2. Dated 9 December 1961. (SPC.DS.16.1)*. Canberra: Sea Power Centre Australia.

United States Archives[3]

United States Navy History and Heritage Command Archives Branch

Admiral Arleigh Burke Personal Papers Collection. Folder DJ-DOX (Vice Admiral Roy Dowling RAN): United States Navy.

[3] Specific reference is made to the contents of US archives in appropriate footnotes in the thesis and appendices.

Admiral Arleigh Burke Personal Papers Collection. Folder BU (Vice Admiral Henry Burrell RAN): United States Navy.

United States National Archives and Administration (College Park, Maryland)

United States Navy Bureau of Ships

Record Group 19, Records of the Bureau of Ships, Unclassified Central Correspondence, 1960, DDE (FRAM) /9710 1960 thru DDG2 (VOL 1) 1960, Box Number 280.

Record Group 19, Records of the Bureau of Ships, Confidential General Correspondence, 1960, C-DD3 820 thru C-DDG2CLASS/9010, Box Number 41.

Record Group 19, Records of the Bureau of Ships, Confidential General Correspondence, 1960, C-DDG2CLASS/9020 thru C-DDG2CLASS/9820, Box Number 42.

Record Group 19, Records of the Bureau of Ships, Confidential General Correspondence, 1960, C-DDG2CLASS/9880 thru C-DDR 834, Box Number 43.

Record Group 19, Records of the Bureau of Ships, Confidential General Correspondence, 1961, C-DDG2C1/9240 4 thru C-DDG2C1/9780 VOL 1, Box Number 60.

Record Group 19, Records of the Bureau of Ships, Confidential General Correspondence, 1961, C-DDG2C1/9780 VOL 2 thru C-DDG2C1 VOL 3, Box Number 61.

Record Group 19, Records of the Bureau of Ships, Confidential General Correspondence, 1961, C-DDG2C1/9780 VOL 4 thru C-DDG2C1, Box Number 62.

Record Group 19, Records of the Bureau of Ships, Unclassified Central Correspondence, 1961, DDG2-CL/9080 (V.3) 4/16/61 thru DDG2-CL/9080 (V.5) 6/16/61, Box Number 241.

Record Group 19, Records of the Bureau of Ships, Unclassified Central Correspondence, 1961, DDG2-CL/9080 (V.5) 6/16/61 thru DDG2-CL/9080 (V.7) 10/1/61, Box Number 242.

Record Group 19, Records of the Bureau of Ships, Unclassified Central Correspondence, 1961, DDG2-CL/9670 (V.6) 7/1/61 thru DDG2-CL/9670 (V.8) 10/1/61, Box Number 258.

United States Department of State

Record Group 59 General Records of the Department of State, Central Decimal file: 1960-63, From: 743.34/1-3162 To: 743.56/2-1960, Box 1684.

Record Group 59 General Records of the Department of State, Central Decimal file: 1960-63, From: 743.5622/4-160 To: 744.00/1-2160, Box 1685.

II Printed Sources

Australian Parliamentary Debates[4]

Commonwealth Parliamentary Debates House of Representative Official Hansard 1956 – 2000

Commonwealth Parliamentary Debates Senate Official Hansard 1956 – 2000

[4] Reference to specific House of Representatives and Senate debates is given with the applicable footnotes in the thesis and appendices. All copies of Hansard can be found at: http://www.aph.gov.au/hansard

Commonwealth of Australia Defence Policy Documents[5]

Commonwealth of Australia. Australian Defence (Defence White Paper 1976). Canberra: Australian Government Publishing Service, November 1976.

———. Australian Defence Review. Canberra: Australian Government Publishing Service, 1972.

———. The Defence of Australia, 1987. Canberra: Australian Government Publishing Service, 1987.

———. Australia's Strategic Planning in the 1990s. Canberra: Departmental Publications 113/92, September 1992.

———. Strategic Review 1993. Canberra: Australian Government Publishing Service, December 1993.

———. Defending Australia (Defence White Paper 1994). Canberra: Australian Government Publishing Service, November 1994.

———. Australia's Strategic Policy. Canberra: Defence Publishing and Visual Communications, 1997.

———. Defence 2000: Our Future Defence Force. Canberra: Defence Publishing Service, 2000.

———. Defending Australia in the Asia Pacific Century : Force 2030 (Defence White Paper 2009). Canberra: Canberra : Australian Govt. Pub. Service, 2009.

Department of Defence (Australia). Australian Defence: Report on the Reorganisation of the Defence Group of Departments. Presented to the Minister for Defence, November 1973 (Tange Review). Canberra: Dept. of Defence, 1973.

———. Force Structure Review. Canberra: Australian Government Publishing Services, May 1991.

———. Future Directions for the Management of Australia's Defence - Report of the Defence Efficiency Review. Canberra, A.C.T: Directorate of Publishing and Visual Communications, 1997.

Other Australian Department of Defence Documents

Department of Defence (Australia). *Defence Capability Plan 2001-2010 (Public Version)*, edited by Roche, M., D. Mueller. Canberra: Defence Publishing Service, 2001.

Dibb, Paul. Review of Australia's Defence Capabilities: Report to the Minister for Defence. Canberra: Australian Govt. Pub. Service, 1986.

Royal Australian Navy. *Australian Maritime Doctrine (RAN Doctrine 1) 2000*. 1st ed. Canberra, ACT: Defence Publishing Service, 2000.

———. Australian Navy Orders 1/73 to 13/73 (5/73 - Officers - Zones for Promotion in the Royal Australian Navy). Dated 25 January 1973. Canberra: Sea Power Centre Australia.

---

[5] Policy documents in this group are arranged by date of publication. All Defence Policy documents are available from the Australian Department of Defence web site: http://www.defence.gov.au/

———. Australian Navy Orders 181/67 Officers - Bridge Watchkeeping and Ocean Navigation Certificates and Certificates of Fitness for Seaman Duties. Dated 25 April 1967. Canberra: Sea Power Centre Australia.

———. Australian Navy Orders 358/72 to 363/72 (358/72 - the Management of the DDL Project). Dated 10 January 1972. Canberra: Sea Power Centre Australia.

———. Australian Navy Orders 130-131/75 - Department of Defence Reorganisation and Organisation of the Naval Staff - Interim Stage. Dated 5 May 1975. Canberra: Sea Power Centre Australia.

———. Commonwealth Navy Orders 1022/56 - The New Officer Structure. Dated 22 October 1956. Canberra: Sea Power Centre Australia.

———. Commonwealth Navy Orders 407/64 - Rank and Command - Command - Revised Definitions. Dated 7 July 1964. Canberra: Sea Power Centre Australia.

Other Publications

The Auditor-General. *Life-Cycle Costing in the Department of Defence*. Canberra: Australian National Audit Office, 1998.

———. *Management of Major Equipment Acquisition Projects (Department of Defence)*. Performance Audit. Vol. 13 (1999-2000). Canberra: Australian National Audit Office, 1999.

United States Navy. *Underway Replenishment - NWP 4-01.4*. Naval Warfare Publication (NWP). Washington DC: United States Navy Doctrine Command, 1996.

Maxwell Reed. "The RAN Guided Missile Destroyer Project (SPC.DS.26)." The Institution of Mechanical Engineers, 1965: 1-4.

Newspapers

Navy News. Royal Australian Navy, 1958 – 2001, Volumes 1 – 44.[6]

"Lack of Staff made U.K. Refuse Missile Ship Order." *Melbourne Age,* 21 February 1964.

"US Methods may be Adopted by RAN." *Sydney Morning Herald,* 1 July 1961.

Bagwell, Sheryle. "Engineering the Frigate Victory." *The Australian Financial Review,* 18 August 1989.

Barker, Geoffrey. "Bigger, Better - but Riskier." *The Australian Financial Review,* 9 March 2007.

Bergmann, Kym. "Destroyer Program on Full Throttle - Defence Special Report." *The Australian,* 23 October 2010.

Cockburn, Milton. "Dibb Report Rejected as 'Fortress Australia'." *Sydney Morning Herald,* 5 September 1986.

Dibb, Paul. "Navy Faces the $10bn Question." *The Sydney Morning Herald,* 11 June 2007.

Hawkins, Max. "Push is on for Decision to Plug Air-Warfare Destroyer Gap - Defence Update - A Special Report." *The Australian,* 20 November 2000.

---

[6] Details of the specific edition of the *Navy News* are provided as a footnote for the associated mention in the thesis and other appendices. All editions are available at the Royal Australian Navy web site: http://www.navy.gov.au/media-room/publications/navy-news

Hurrell, Bronwyn. "Tears for Last Voyage of a Proud Warrior." *Adelaide Advertiser,* 4 August 2000.

Jennings, Peter. "The Tempo of Election Cycles does Not Benefit Big Defence Projects." *The Australian,* 14 February 2015.

Martin, Sarah. "Fears of further Delays to the Nation's Biggest Defence Project." *The Australian,* 18 September 2013.

McPhedran, Ian. "Navy Told US Ships Too Risky." *Herald-Sun,* 5 November 1999.

Perret, Bradley. "Navantia Captures Contracts for Australia Destroyer, Assault Ships." *Aviation Week's Aerospace Daily & Defense Report,* 21 June 2007.

Walters, Patrick. "Key Defence Report Strategy Dropped." *Sydney Morning Herald,* 17 November 1986.

———. "Targeting the Armada." *The Australian,* 19 June 2007.

White, Hugh. "Scrap $6bn Destroyer Program we Don't Need." *The Canberra Times,* 5 June 2005.

Wilson, David. "Fighters Ready to Confront Threat (Operation Handover - September 1964)." *Royal Australian Airforce News,* 27 February 2003.

III Oral Sources[7]

Transcribed interviews were held with individuals as shown. They are arranged in date sequence of their interview. All naval officers were members of the RAN.

Vice Admiral Robert Walls	30 August 2011 and 18 October 2011
Commodore Ormsby Cooper	15 September 2011
Commander Robert Hall	5 September and 13 October 2011
Commodore Ian Holmes	3 October 2011
Commodore Ormsby Cooper	18 October 2011
Rear Admiral Murray Forrest	9 and 19 December 2011
Rear Admiral Guy Griffiths	13 and 19 January 2012
Rear Admiral Maxwell Reed	8 February 2012
Rear Admiral Trevor Ruting	7 March 2012
Vice Admiral David Leach	14 March 2012

[7] Reference is made to specific pages of interviews in the appropriate footnote in the thesis and appendices. Under the agreement with those interviewed, electronic copies of each audio file and transcript will be held the University of NSW (Canberra) for seven years after completion of the research. The agreement also stipulated that the interview will not be made available to others without the consent of the interviewee or person they nominate.

Rear Admiral Oscar Hughes	26 March 2012
Rear Admiral Peter Purcell	23 April 2012
Rear Admiral Ian Crawford	30 May 2012
Rear Admiral David Campbell	28 June 2012
Commander Robert Mummery	4 July 2012
Commodore Richard Menhinick	12 July 2012
Captain Ian Pfennigwerth	26 July 2012
Commander Antony Anderson	24 August 2012
Mr Andrew Johnson	17 December 2012
Captain David Cotsell	8 January 2013
Vice Admiral Christopher Ritchie	30 January 2013
Captain Christopher J. Skinner	1 February 2013
Vice Admiral Donald Chalmers	8 February 2013
The Hon Kim Beazley	4 September 2014

B. SECONDARY SOURCES

I Published

Charles F. Adams Class Destroyers: Charles F. Adams Class Destroyers of the United States Navy, Kimon Class Destroyers, Lutjens Class Destroyers, Perth Class Destroyers, USS Benjamin Stoddert, USS Tattnall, USS Berkeley, USS Towers, USS Barney, USS Joseph Strauss, USS Waddell. Memphis, Tennessee: Books LLC, 2011.

Air Warfare Destroyer Alliance. "Air Warfare Destroyer - the Project." Air Warfare Destroyer Alliance. http://www.ausawd.com/content.aspx?p=62.

Donald Allan. "A Slack Day in Military Region IV: HMAS Perth and the Hoi Chanh." *Journal of Australian Naval History,* Vol 7, no. 2, 10 July 2013: 90-101.

Andidora, Ronald. *Iron Admirals : Naval Leadership in the Twentieth Century*. Westport, Conn: Greenwood Press, 2000.

Arena, Mark V. *Why has the Cost of Navy Ships Risen? : A Macroscopic Examination of the Trends in U.S. Naval Ship Costs Over the Past several Decades*. Santa Monica, CA: RAND Corporation, 2006.

Aviation Week & Space Technology. "Electronic Intelligence - Royal Australian Navy (OBU for RAN)." *Aviation Week & Space Technology,* Vol 131, no. 11, 1989: 117.

Baer, George W. *One Hundred Years of Sea Power: The U.S. Navy, 1890-1990*. California: Stanford University Press, 1994.

Christopher Barrie. "The Protection of Shipping - what some Strategists Think." *Journal of the Australian Naval Institute,* Vol 5, no. 4, 1979: 34-39.

Beaumont, Joan. *The Australian Centenary History of Defence: Australian Defence: Sources and Statistics*. Vol. VI. Melbourne: Oxford University Press, 2001.

Beazley, K. "Navies, Diplomacy and Maritime Power Projection." In: Naval Diplomacy and Maritime Power Projection (Proceedings of the Royal Australian Navy Sea Power Conference 2013) , edited by Forbes, Andrew, 95-102. Canberra : Sea Power Centre Australia, 2014.

Nigel Berlyn. "RAN FFG Acquisition." *Journal of the Australian Naval Institute,* Vol 2, no. 3, August 1976: 27-36.

Birkler, John, John Schank, and et al. *Australia's Naval Shipbuilding Enterprise - Preparing for the 21st Century*. Santa Monica. California: RAND Corporation, 2015.

Blackman, Raymond, ed. *Jane's Fighting Ships 1968 - 69*. London: Jane's Fighting Ships Publishing Ltd, 1968.

Bolton, Geoffrey, ed. *The Oxford History of Australia - the Middle Way*. The Oxford History of Australia. Vol. 5 (1942-1988). Melbourne: Oxford University Press, 1986.

Booth, Ken. *Navies and Foreign Policy*. London : New York: London : Croom Helm ; New York : Crane, Russak, 1977.

Boslaugh, David L. *When Computers Went to Sea*. Los Alamitos, California: IEEE Computer Society, 1999.

Boutilier, James A. "Get Big Or Get Out: The Canadian and Australian Decisions to Abandon Aircraft Carriers." In: Reflections on the Royal Australian Navy , edited by Frame, T. R., J. V. P. Goldrick and P. D. Jones, 382-405. Kenthurst N.S.W. : Kangaroo Press, 1991.

Burgess, Eric. *Guided Weapons*. London: Chapman and Hall, 1957.

Burrell, Henry, A. B. Lodge, Hugh Smith, and John Cashman. *Mermaids do Exist*. South Melbourne: Macmillan, 1986.

Cannon, Geoff. "Technology Transfer, Knowledge Partnerships and the Advance of Australian Naval Combat Systems." In: The Navy and the Nation: The Influence of the Navy on Modern Australia , edited by Reeve, John and David Stevens, 248-268. Crows Nest, N.S.W. : Allen & Unwin, 2005.

Cavas, Christopher. "US Navy Reviews how to Count its Ships - Interview with U.S. Navy Undersecretary Bob Work." *US Defense News,* 30 April 2012, : 18.

Collins, John. *As Luck would have it: The Reminiscences of an Australian Sailor*. Sydney: Angus and Robertson, 1965.

Robert d. Colvin. "Aftermath of the Elath: US Naval Institute Proceedings (Annapolis). October 1969." *Survival,* Vol 12, no. 1, : 7-12.

Commonwealth of Australia. "Ikara the Weapon Thrower." . http://aso.gov.au/titles/sponsored-films/ikara-weapon-thrower/clip3/.

———. *Officer Education: The Military After Next*, edited by Joint Standing Committee on Foreign Affairs, Defence and Trade. Canberra: Commonwealth of Australia, October 1995.

Cooper, Alastair. "1945-1954: The Korean War Era." In: The Australian Centenary History of Defence Volume III. the Royal Australian Navy , edited by Stevens, David, 155-179. Melbourne : Oxford University Press, 2001.

———. "1955-1972: The Era of Forward Defence." In: The Australian Centenary History of Defence Volume III. the Royal Australian Navy , edited by Stevens, David, 181-209. Melbourne : Oxford University Press, 2001.

———. "At the Crossroads: Anglo-Australian Naval Relations, 1945-1971." *The Journal of Military History,* Vol Vol 58, no. 4, 1994: 699-718.

———. "The Development of an Independent Navy for Australia: Correspondence between the First Naval Member and the First Sea Lord 1947-59." In: The Naval Miscellany , edited by Rose, Susan. Vol. VII, 511-670. Farnham : Ashgate Press, 2008.

Cordner, Lee. "Command at Sea in War and Peace - an Australian Experience during the Gulf War and After." In: The Face of Naval Battle: The Human Experience of Modern War at Sea , edited by Reeve, John and David Stevens, 240-259. Crows Nest, N.S.W. : Allen & Unwin, 2003.

———. "The most Capable Warships in the Navy's History Set to Join the Fleet." *Headmark (Journal of the Australian Naval Institute),* no. 130, 2008: 4-14.

Russell Crane. "The Royal Australian Navy's Force 2030: An Asia-Pacific Strategy." *The RUSI Journal,* Vol 156, no. 2, : 68-73.

Cunningham, I. J. *Work Hard Play Hard, the Royal Australian Naval College 1913-1988*. Canberra: AGPS Press, 1988.

Department of Defence (Australia). *The Australian Approach to Warfare*. Canberra: Department of Defence, 2002.

———. *The Australian Naval Shipbuilding and Repair Sector Strategic Plan*. Canberra: Defence Materiel Organisation, 2002.

———. *Defence Capability Development Handbook 2012*. Canberra: Defence Capability Development Group, 2012.

———. *Defence Capability Plan 2012*. Canberra: Defence Capability Development Group and the Defence Materiel Organisation, 2012.

———. *Defence Procurement Policy Manual (2013)*. Canberra: Defence Materiel Organisation, 2013.

———. *Explaining NCW - Network Centric Warfare*. Canberra: Defence Publishing Service, 21 February 2006.

———. *Future Joint Operating Concept 2030*. Canberra: Department of Defence, 2011.

———. *Going to the Next Level - the Report of the Defence Procurement and Sustainment Review (the Mortimer Review)*. Canberra: Defence Materiel Organisation, 2008.

———. *Purchase of Aegis Combat System for Destroyers (MIN 196/05)*. Canberra: Commonwealth of Australia, 9 December 2005.

———. "SEA 1390 PH2.1 - FFG Upgrade Project (FFG-UP)." Defence Materiel Organisation. http://www.defence.gov.au/dmo/msd/sea1390/sea1390.cfm#history.

———. *The Strategic Reform Program MAKING IT HAPPEN*. Canberra: Defence Publishing services, 2010.

———. *The Strategy Framework (2010)*. Canberra: Defence Publishing Services, 2010.

Dibb, Paul. *Planning a Defence Force without a Threat : A Model for Middle Powers*. Canberra: Australian National University, 1996.

DiGirolamo, Vinny. *Naval Command and Control: Policy, Programs, People & Issues*. Fairfax, Va: AFCEA International Press, 1991.

Dixon, Norman F. *On the Psychology of Military Incompetence*. London: Jonathan Cape, 1976.

Donohue, H. J. *From Empire Defence to the Long Haul: Post-War Defence Policy and its Impact on Naval Force Structure Planning, 1945-1955*. Papers in Australian Maritime Affairs. Vol. 1. Canberra: RAN Maritime Studies Program, 1996.

Doolan, Ken. "The Gulf Challenge." In: Maritime Power in the 20th Century - the Australian Experience , edited by Stevens, David, 199-214. St Leonards, N.S.W : Allen & Unwin, 1998.

———. *Steel Cat (the Story of HMAS BRISBANE)*. Queanbeyan: Grinkle Press, 2009.

Drucker, Peter. *Managing in a Time of Great Change*. Oxford: Butterworth-Heinemann Ltd, 1995.

Duren, Bernard G. and James R. Pollard. *Combat Systems Vision 2030 Combat Systems Architecture: Design Principles and Methodology*. Vol. NAVSWC TR91-795. Dahlgren Virginia: Naval Surface Warfare Centre, 1991.

R. J. Eastwood. "The Update of the RAN DDGs." *Pacific Defence Reporter,* no. August, 1978: 53-56.

Edwards, P. G. *Arthur Tange: Last of the Mandarins*. Crows Nest, N.S.W.: Allen & Unwin, 2006.

Evans, S. D. *A Fatal Rivalry: Australia's Defence at Risk*. South Melbourne: Macmillan, 1990.

Grahame Falls. "Maritime Logistics Category Management." *RAN Maritime Logistics Community News,* Vol Summer/Autumn, no. 2012/2013, 29 October 2013: 52.

Floud, Roderick. *An Introduction to Quantitative Methods for Historians*. Princeton, N.J: Princeton, N.J : Princeton University Press, 1973.

Forbes, Andrew, ed. *The Naval Contribution to National Security and Prosperity (Proceedings of the Royal Australian Navy Sea Power Conference 2012)*. Canberra: Sea Power Centre Australia, 2013.

———. *The Strategic Importance of Seaborne Trade and Shipping : A Common Interest of Asia Pacific*. Papers in Australian Maritime Affairs. 10th ed. Canberra A.C.T.: Sea Power Centre Australia, 2001.

Forsberg, Randall, ed. *World Weapon Database - Institute for Defense and Disarmament Studies*. Lexington: Mass: Lexington Books, 1986.

Frame, T. R., ed. *The Australian Navy in Vietnam - Lessons and Legacies from 1965*. Canberra ACT: Barton Books, 2015.

———. *No Pleasure Cruise: The Story of the Royal Australian Navy*. Crows Nest, N.S.W.: Allen & Unwin, 2004.

———. *Pacific Partners: A History of Australian-American Naval Relations*. Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992.

———. *Where Fate Calls : The HMAS Voyager Tragedy*. Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992.

Frame, T. R., James Goldrick, and P. D. Jones, eds. *Reflections on the Royal Australian Navy*. Kenthurst N.S.W.: Kangaroo Press, 1991.

Friedman, Norman. *The Fifty-Year War : Conflict and Strategy in the Cold War*. Annapolis, Md.: Naval Institute Press, 2000.

———. *Modern Warship Design and Development*. First American ed. New York: Mayflower Books, 1979.

———. *The Naval Institute Guide to World Naval Weapons Systems*. Annapolis, MD: Naval Institute Press, 1990.

———. *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars*. Annapolis, Md.: Naval Institute Press, 2009.

———. *New Technology and Medium Navies*. Working Papers. Vol. 1. Jervis Bay, N.S.W.: RAN Maritime Studies Program, 1999.

———. *The Postwar Naval Revolution*. Annapolis, MD: Naval Institute Press, 1986.

———. *Some Trends in Military Technology, 1980-2000*. Hudson Institute Discussion Paper. Croton-on-Hudson, N.Y: Hudson Institute, Inc, 1979.

———. *U.S. Destroyers: An Illustrated Design History*. Revised ed. Annapolis, Md.: Naval Institute Press, 2004.

———. *U.S. Naval Weapons : Every Gun, Missile, Mine, and Torpedo used by the U.S. Navy from 1883 to the Present Day*. Annapolis, MD: Annapolis, MD : Naval Institute Press, 1982.

———. *The US Maritime Strategy*. London: Jane's, 1988.

Friedman, Norman, A. D. Baker, and Alan Raven. *British Destroyers & Frigates: The Second World War and After*. London: Chatham Publishing, 2006.

Frühling, Stephan. *A History of Australian Strategic Policy since 1945*. Canberra: Defence Publishing Service, 2009.

Gibbs and Cox. "History of Gibbs and Cox." Gibbs and Cox. http://www.gibbscox.com/about/history-of-gibbs-cox/.

Gilbert, G. P. *Australian Naval Personalities: Lives from the Australian Dictionary of Biography*. Papers in Australian Maritime Affairs. Vol. 17. Canberra ACT: Sea Power Centre Australia, 2006.

Goldrick, James. "Carriers for the Commonwealth." In: Reflections on the Royal Australian Navy , edited by Frame, T. R., J. V. P. Goldrick and P. D. Jones, 220-244. Kenthurst N.S.W. : Kangaroo Press, 1991.

———. "A Fleet Not a Navy; some Thoughts on the Themes." In: Southern Trident - Strategy, History and the Rise of Australian Naval Power , edited by Stevens, David and John Reeve, 291-295. Crows Nest, N.S.W. : Allen & Unwin, 2001.

———. "Specialize Or Not? Former RAN CO's Reflections on Surface Warfare Development (Rear Admiral James Goldrick, RAN Rtd)." Centre for International Maritime Security. http://cimsec.org/specialize-former-ran-cos-reflections-surface-warfare-officer-development/13305.

Goldrick, James and John Hattendorf, eds. *Mahan is Not enough - the Proceedings of a Conference on the Works of Sir Julian Corbett and Admiral Sir Herbert Richmond*. Newport Rhode Island: Naval War College Press, 1993.

Gordon, Andrew. "Operational Command at Sea." In: The Face of Naval Battle: The Human Experience of Modern War at Sea , edited by Reeve, John and David Stevens, 38-52. Crows Nest, N.S.W. : Allen & Unwin, 2003.

———. *The Rules of the Game : Jutland and British Naval Command*. Annapolis, MD: Naval Institute Press, 1996.

Gray, Colin S. *The Leverage of Sea Power : The Strategic Advantage of Navies in War*. New York : Toronto : New York: New York : Free Press ; Toronto : Maxwell Macmillan Canada ; New York : Maxwell Macmillan International, 1992.

———. *Modern Strategy*. Oxford: Oxford University Press, 1999.

Grey, Jeffrey. *A Military History of Australia*. 3rd ed. Melbourne: Cambridge University Press, 2008.

———. "The Royal Australian Navy in the Era of Forward Defence, 1955 - 75." In: In Search of a Maritime Strategy , edited by Stevens, David, 99-113. Canberra : Australian National University, 1997.

———. *Up Top: The Royal Australian Navy and Southeast Asian Conflicts, 1955-1972*. The Official History of Australia's Involvement in Southeast Asian Conflicts, 1948-1975. St. Leonards, N.S.W: Allen & Unwin in association with the Australian War Memorial, 1998.

Griffiths, G. "DDGs in Vietnam: HMAS Hobart 7 March to 27 September 1967." In: Reflections on the Royal Australian Navy , edited by Frame, T. R., J. V. P. Goldrick and P. D. Jones, 330-337. Kenthurst N.S.W. : Kangaroo Press, 1991.

Grove, Eric. "Advice and Assistance to a very Independent People at a most Crucial Point: The British Admiralty and the Future of the RAN 1958-60." In: Maritime Power in the 20th Century - the Australian Experience , edited by Stevens, David, 135-155. St Leonards, N.S.W : Allen & Unwin, 1998.

———. "British and Australian Naval Policy in the Korean War Era." In: Reflections on the Royal Australian Navy , edited by Frame, T. R., J. V. P. Goldrick and P. D. Jones, 245-274. Kenthurst N.S.W. : Kangaroo Press, 1991.

———. *The Future of Sea Power*. London: Routledge, 1990.

———. "Richmond and Arms Control." In: Mahan is Not enough the Proceedings of a Conference on the Works of Sir Julian Corbett and Admiral Sir Herbert Richmond , edited by Goldrick, James and John Hattendorf, 227-241. Newport, Rhode Island : Naval War College Press, 1993.

———. *Vanguard to Trident: British Naval Policy since World War II*. London: U.S. Naval Institute, 1987.

Hagan, Kenneth J. *This People's Navy : The Making of American Sea Power*. New York : Toronto: New York : Free Press ; Toronto : Collier Macmillan, 1991.

Hancock, Ian. *John Gorton: He did it His Way*. Sydney: Hodder, 2002.

Michael Harrison. "Warfare Training in the UK: Is it the Best Option?" *Journal of the Australian Naval Institute,* Vol 8, no. 4, 1982: 29-36.

Hartmann, Frederick H. *Naval Renaissance: The U.S. Navy in the 1980s*. Annapolis, MD: Naval Institute Press, 1990.

Hastings, Max. *Bomber Command*. London: London : Papermac, 1993.

———. *Going to the Wars*. London: London : Macmillan, 2000.

Hattendorf, John. *What is a Maritime Strategy*. Canberra: Sea Power Centre Australia, 2013.

Hawke, Allan. *The Diarchy - Paper by Allan Hawke Secretary Department of Defence (Based on Address to Royal United Services Institute, Adelaide)*. Canberra: Department of Defence, 1 May 2000.

Hayward, Joel S. A. *For God and Glory : Lord Nelson and His Way of War*. Annapolis, Md.: Annapolis, Md. : Naval Institute Press, 2003.

Christopher Hill, David Dees, Brett Williams and Will Meyer. "Fix the Shipboard Air Intercept Controller Program (Professional Notes)." *United States Naval Institute Proceedings,* Vol 139, no. 12/1,330, 2013: 76-77.

Hill, John R. *Medium Power Revisited*. Working Papers. Vol. 3. Jervis Bay ACT: RAN Sea Power Centre, 2000.

William Holland J. "Designing the Future Warships." *US Naval Institute Proceedings,* Vol 14/1/1,313, 14 January 2015: 24-29.

Holmes, Richard. *Firing Line*. London: London : Cape, 1985.

David Holthouse. "Reflections on Four Decades in the Profession of Naval Engineering - and Jacky Fisher Got it Right!" *Headmark (Journal of the Australian Naval Institute),* no. 151, 2014: 42-47.

Hoopes, James. *Oral History : An Introduction for Students*. Chapel Hill: Chapel Hill : University of North Carolina Press, 1979.

Horner, D. M. *Defence Supremo: Sir Frederick Shedden and the Making of Australian Defence Policy*. St. Leonards, N.S.W.: Allen & Unwin, 2000.

———. *The Gulf Commitment: The Australian Defence Force's First War*. Carlton, Vic.: Carlton, Vic. : Melbourne University Press, 1992.

Howell, Martha C. and Walter Prevenier. *From Reliable Sources : An Introduction to Historical Methods*. Ithaca, N.Y.: Cornell University Press, 2001.

Anthony Hunt. "Naval Capital Equipment Project Management." *Journal of the Australian Naval Institute,* Vol 12, no. 4, November 1986: 53-56.

Hyslop, Robert. *Australian Naval Administration, 1900-1939*. Melbourne: Hawthorn Press, 1973.

———. *Aye Aye, Minister: Australian Naval Administration, 1939-59*. Canberra: Australian Govt. Print. Service, 1990.

———. "Ministers Responsible for Naval Defence since Federation." In: Reflections on the Royal Australian Navy , edited by Frame, T. R., J. V. P. Goldrick and P. D. Jones, 53-69. Kenthurst N.S.W. : Kangaroo Press, 1991.

Jackson, Aaron P. *Keystone Doctrine Development in Five Commonwealth Navies : A Comparative Perspective*. Papers in Australian Maritime Affairs. Vol. 33. Canberra: Sea Power Centre Australia, 2010.

Janes Defence Weekly. "Australia may Buy Extra Mekos to Replace DDGs." *Jane's Defence Weekly,* 26 August 1989: 1-2.

———. "ITT Seeks Radar Export Go Ahead." *Jane's Defence Weekly,* 13 July 1991: 1.

———. "RAN Set to Move in New Direction." *Jane's Defence Weekly,* 7 August 1996: 1.

———. "US Navy Chief Fears Shortfall After Budget." *Jane's Defense Weekly,* 3 June 1989: 1.

Janes Information Group. *Jane's all the World's Aircraft 1962-63*. London: Jane's Information Group, 1962.

———. *Jane's Fighting Ships 1964-65*. London: Sampson Low, Marston and Co, 1964.

———. *Jane's Fighting Ships 1966 - 67*, edited by Blackman, Raymond. London: Jane's Fighting Ships Publishing, 1968.

———. *Jane's Fighting Ships 1991-92*, edited by Janes Information Group. London: Sampson Low, Marston and Co, 1991.

———. *Jane's Weapon Systems 1988-89*. London: London : Jane's Yearbooks, 1988.

Janes International Defense Review. "Todays "Revolution at Sea" the Arleigh Burke (DDG 51) Aegis." *Janes International Defense Review,* 1 March 1989: 1-6.

———. "US Proposing Massive Defense Cuts." *Janes International Defense Review,* 1 May 1989: 1-2.

Janes Naval Weapon Systems. "USN Weapon Direction Systems." *Janes Naval Weapon Systems,* 23 January 2012: 1-4.

Janes Navy International. "ANZAC ASMD Upgrade Package Completes Final Acceptance Trial." *Janes Navy International,* 10 September 2013: 1-2.

———. "ANZAC WIP has Two-Way Split." *Janes Navy International,* 1 October 1998: 1-2.

———. "ANZAC WIP Scrapped." *Janes Navy International,* 1 December 1999: 1.

———. "Australia Considers Anzac Proposal." *Janes Navy International,* 1 November 1999: 1-3.

———. "Australia's Navy at the Southern Crossroads." *Janes Navy International,* 1 April 1996: 1-15.

———. "Improving Standards: A Longer Punch for the FFG-7." *Jane's Navy International,* 5 August 2013: 1-13.

———. "News in Brief 'no' to Kidd Class." *Jane's Navy International,* 21 June 2000: 1-1.

———. "RAN Charts Surface Fleet Course." *Janes Navy International,* 1 May 1995: 1.

———. "Seven in Frame for ESSM Block 2 Development." *Janes Navy International,* 14 November 2013: 1-2.

———. "Virtual Warfare - using Simulation to Improve Performance." *Janes Navy International,* 1 April 1997: 1-12.

Jans, Nick. *Nature, Nurture and Leadership Culture - Or it's the Backswing, Stupid* Canberra : Australian Defence College - Defence Centre for Leadership and Ethics., 2011.

———. *Once were Warriors? : Leadership, Culture and Organisational Change in the Australian Defence Organisation*, edited by Hart, Jane. Weston Creek, A.C.T.: Australian Defence College, Centre for Defence Command, Leadership and Management Studies, 2003.

———. "Rich Organisation, Poor Organisation: Defence Performance and Military Leadership." *Australian Defence Force Journal,* no. 142, : 5-10.

Jans, Nick, Stephen Mugford, Jamie Cullens, and Judy Frazer-Jans. *The Chiefs - A Study of Strategic Leadership*. Canberra: Centre for Defence Leadership and Ethics, Australian Defence College, 2013.

Nick Jans and David Schmidtchen. "Culture and Organisational Behaviour at Australian Defence Headquarters." *Australian Defence Force Journal,* no. 158, : 23-28.

Jeremy, John. "Australian Shipbuilding and the Impact of the Second World War." In: The Navy and the Nation: The Influence of the Navy on Modern Australia , edited by Reeve, John and David Stevens, 185-209. Crows Nest, N.S.W. : Allen & Unwin, 2005.

Jones, Justin, ed. *A Maritime School of Strategic Thought for Australia - Perspectives*. Sea Power Series. Canberra: Sea Power Centre Australia, 2013.

Jones, Peter. "1972-1983: Towards Self-Reliance." In: The Australian Centenary History of Defence Volume III. the Royal Australian Navy , edited by Stevens, David, 211-238. Melbourne : Oxford University Press, 2001.

———. "1991-2001: A Period of Change and Uncertainty." In: The Australian Centenary History of Defence Volume III. the Royal Australian Navy , edited by Stevens, David, 239-268. Melbourne : Oxford University Press, 2001.

Jones, P. D. "Buying the DDGs." In: Reflections on the Royal Australian Navy , edited by Frame, T. R., J. V. P. Goldrick and P. D. Jones, 316-329. Kenthurst N.S.W. : Kangaroo Press, 1991.

———. "The Royal Australian Naval College: Creswell's Last Great Legacy (Creswell Oration 2013)." *Headmark (Journal of the Australian Naval Institute),* no. 148, 2013: 44-50.

Jones, P. D. and James Goldrick. *Struggling for a Solution - the RAN and the Acquisition of a Surface to Air Missile Capability*. Working Papers. Vol. 2. Jervis Bay, A.C.T.: RAN Maritime Studies Program, 2000.

Kane, Thomas M. *Military Logistics and Strategic Performance*. Portland, OR: F. Cass, 2001.

Keegan, John. *The Face of Battle*. Harmondsworth: Penguin, 1978.

———. *The Price of Admiralty : War at Sea from Man of War to Submarine*. London: London : Arrow, 1990.

Kemp, Peter and Ian Dear. *The Oxford Companion to Ships and the Sea*. 2nd ed. Oxford ; New York: Oxford ; New York : Oxford University Press, 2005.

Kennedy, Paul M. *Engineers of Victory: The Problem Solvers Who Turned the Tide in the Second World War*. New York, N.Y.: Random House, 2013.

———. "History from the Middle: The Case of the Second World War." *The Journal of Military History,* Vol 74, no. January, 2010: 35-51.

———. *The Rise and Fall of the Great Powers : Economic Change and Military Conflict from 1500 to 2000*. London: Fontana Press, 1989.

Kinnaird, Malcolm. *Report of the Defence Procurement Review (the Kinnaird Report)*. Canberra: Department of Prime Minister and Cabinet, 2003.

Lambert, Nicholas. "Sir John Fisher, the Fleet Unit Concept, and the Creation of the Royal Australian Navy." In: Southern Trident - Strategy, History and the Rise of Australian Naval Power , edited by Stevens, David and John Reeve, 214-224. Crows Nest, N.S.W. : Allen & Unwin, 2001.

Lambert, Nicholas A. *Australia's Naval Inheritance: Imperial Maritime Strategy and the Australia Station 1880-1909*. Papers in Australian Maritime Affairs. Vol. 6. Canberra: RAN Maritime Studies Program, 1998.

———. *Sir John Fisher's Naval Revolution*. Columbia, S.C.: University of South Carolina Press, 1999.

Lavery, Brian. *In which they Served : The Royal Navy Officer Experience in the Second World War*. London: Conway, 2008.

Leach, D. W. "DDGs in Vietnam: HMAS Perth 19 September 1968 to 19 April 1969." In: Reflections on the Royal Australian Navy , edited by Frame, T. R., J. V. P. Goldrick and P. D. Jones, 338-342. Kenthurst N.S.W. : Kangaroo Press, 1991.

Bruce Loxton. "Some Personnel Implications of the Introduction of the FFG into the RAN." *Journal of the Australian Naval Institute,* Vol 3, no. 1, February 1977: 10-14.

G. MacKinnell. "The SWOC - Australian Trained PWOs." *Journal of the Australian Naval Institute,* Vol 11, no. 1, 1985: 45-46.

Mahan, A. T. *The Influence of Sea Power upon History 1660-1805*. London: London : Hamlyn, 1980.

Marolda, Edward J. *By Sea, Air, and Land : An Illustrated History of the U.S. Navy and the War in Southeast Asia*. Washington: Naval Historical Center, Dept. of the Navy, 1994.

———. *Ready Seapower - A History of the U.S. Seventh Fleet*. Washington DC: U.S. Navy - Naval History and Heritage Command, 2012.

———. *Shield and Sword: The United States Navy and the Persian Gulf War*, edited by Schneller, Robert John. Washington: Washington : Naval Historical Center, Dept. of the Navy, 1998.

———. "Wall of Steel: Sea Power and the Cold War in Asia." In: Maritime Power in the 20th Century - the Australian Experience , edited by Stevens, David, 167-184. St Leonards, N.S.W : Allen & Unwin, 1998.

Massie, Robert K. *Castles of Steel : Britain, Germany, and the Winning of the Great War at Sea*. New York: Random House, 2003.

McCaffrie, Jack, ed. *Managing and Protecting the Offshore Estate*. Canberra, ACT: Australian Defence Studies Centre, 1995.

———. *Positioning Navies for the Future: Challenge and Response : Proceedings of the Royal Australian Navy Sea Power Conference 2004*. Sydney: Halstead Press, 2006.

McCaffrie, Jack and Dick Sherwood, eds. *The Navy and Regional Engagement*. Canberra: Australian Defence Studies Centre - ADFA, 1996.

McComb, Dave and Paul Wright. *US Destroyers 1939-45 Pre-War Classes*. New Vanguard. Vol. 162. Oxford: Osprey, 2010.

McKee, Christopher. *Sober Men and True: Sailor Lives in the Royal Navy, 1900-1945*. London: Harvard University Press, 2002.

Minister for Defence. *Minister for Defence - Release of RAND Corporation Report*. Canberra: Commonwealth of Australia, 16 April 2015.

Moore, John E. *Jane's American Fighting Ships of the 20th Century*. New York: Mallard Press, 1991.

Morrison, David. *Speech from Chief of Army - Seapower Conference Sydney 7 October 2013*. Canberra: Sea Power Centre Australia, 2013.

Morton, Peter. *Fire Across the Desert: Woomera and the Anglo-Australian Joint Project 1946-1980*. Canberra: AGPS Press, 1989.

Muir, Malcolm. *Black Shoes and Blue Water: Surface Warfare in the United States Navy, 1945-1975*. Contributions to Naval History. Washington, D.C: Naval Historical Center, Dept. of the Navy, 1996.

Murfett, Malcolm H. *In Jeopardy : The Royal Navy and British Far Eastern Defence Policy, 1945-1951*. Kuala Lumpur ; New York: Kuala Lumpur ; New York : Oxford University Press, 1995.

Nash, Peter V. *The Development of Mobile Logistic Support in Anglo-American Naval Policy, 1900-1953*. Gainesville: Gainesville : University Press of Florida, 2009.

NavSource Naval History. "HMAS Brisbane D-41 History - Commanding Officers." . http://www.navsource.org/archives/05/01027.htm.

David C. Neumann and Warren F. Smith. "HMA Ships: A History of RAN Ship Weight Control." *Pacific 2004 International Maritime Conference,* 2004: 651-655.

Newman, N. "Future Australian Combat Computer Systems (Annual Engineering Conference 1976: Engineering 1976-2001)." *Engineers Australia* (1976): 322-325.

C. J. Oxenbould. "Maritime Operations in the Gulf War." *Journal of the Australian Naval Institute,* Vol 18, no. May Number 2, 1991: 33-39.

Peever, David. *First Principles Review of Defence - Creating One Defence*. Canberra: Department of Defence, 2015.

Perks, Robert and Alistair Thomson. *The Oral History Reader*. 2nd ed. New York: Routledge, 2006.

Perryman, John and Brett Mitchell. *Australia's Navy in Vietnam - Royal Australian Navy Operations 1965-72*. Silverwater, NSW, Australia: Topmill Pty Ltd, 2007.

Pocock, Rowland F. *German Guided Missiles of the Second World War*. Shepperton: Mddx., Allan, 1967.

Pollard, James R. *Combat Systems Vision 2030: Functional Architecture for Future Combat Systems*. Vol. NAVSWC TR91-607. Dahlgren Virginia: Naval Surface Warfare Centre, 1991.

Prysor, Glyn. *Citizen Sailors - the Royal Navy in the Second World War*. London: Penguin Group - Viking, 2011.

Neil Ralph. "Australia's Maritime Trade: The Problem of Defence." *Journal of the Australian Naval Institute,* Vol 2, no. 2, 1976: 6-11.

Raytheon Company (USA). *STANDARD MISSILES Public Release Portfolio Revision F (2012) (SPC.DS.27)* DSER # 214754 Washington DC : Raytheon Company., 2012.

Reckner, James. "A Sea of Troubles: The Great White Fleet's 1908 War Plans for Australia and New Zealand." In: Southern Trident - Strategy, History and the Rise of Australian Naval Power , edited by Stevens, David and John Reeve, 174-196. Crows Nest, N.S.W. : Allen & Unwin, 2001.

Reeve, John. *The Development of Naval Strategy in the Asia-Pacific Region 1500-2000*. Working Papers. Vol. 4. Jervis Bay, N.S.W.: RAN Sea Power Centre, 2000.

———. "Introduction - an Anatomy of the Face of Naval Battle." In: The Face of Naval Battle: The Human Experience of Modern War at Sea , edited by Reeve, John and David Stevens, 3-38. Crows Nest, N.S.W. : Allen & Unwin, 2003.

———. *Maritime Strategy and Defence of the Archipelagic Inner Arc*. Working Papers. Vol. 5. Canberra: RAN Sea Power Centre, 2001.

Reeve, John and David Stevens, eds. *The Face of Naval Battle: The Human Experience of Modern War at Sea*. Crows Nest, N.S.W.: Allen & Unwin, 2003.

Richardson, Dennis. *Secretary of the Department of Defence, Mr Dennis Richardson - Speech to ASPI Dinner, 12 November 2013*. Canberra: Department of Defence, 2013.

Ritchie, Donald A. *The Oxford Handbook of Oral History*. New York ; Oxford: New York ; Oxford : Oxford University Press, 2011.

Rizzo, P. *Plan to Reform Support Ship Repair and Management Practices*. Canberra: Department of Defence, 2011.

Rodger, N. A. M. *The Command of the Ocean : A Naval History of Britain, 1649-1815*. London: Allen Lane in association with the National Maritime Museum, 2004.

———. *The Perils of History (Hattendorf Prize Lecture 2011)*. Rhode Island: US Naval War College, 2011.

Royal Australian Navy. "Air Warfare Destroyer (AWD)." . http://www.navy.gov.au/fleet/ships-boats-craft/awd.

———. . *Australian Fleet Awards. Dated 6 November 2011. (SPC.DS.22)* Fleet File S4582123 Canberra : Sea Power Centre Australia.

———. *Australian Maritime Doctrine (RAN Doctrine 1) 2010*. 2nd ed. Canberra, ACT: Sea Power Centre Australia, 2010.

———. "Combat Computers." *Navy Quarterly,* Vol 2, no. 3, 1973: 22.

———. "The Fleet." Royal Australian Navy. http://www.navy.gov.au/fleet.

The History of the Royal Australian Navy Volumes One and Two 1778 - 1945. DVD. ———. Canberra: 2013.

———. *HMAS Brisbane 25th Anniversary 1992*, edited by Longbottom, R. J. Sydney, NSW: HMAS Brisbane Association, 1993.

———. "HMAS Perth III." . http://www.navy.gov.au/hmas-perth-iii.

———. "The Naval Contribution to Joint Operations Reprinted from the Sea Power Centre's Newsletter, Semaphore, Issue 7, may (2005).]." *Australian Defence Force Journal,* no. 168, : 54-57.

———. "Organisation of the Royal Australian Navy." . http://www.navy.gov.au/organisation.

———. *Warfare Officers Career Handbook*, edited by Naval Warfare Advisory Council. Canberra: Royal Australian Navy, 2006.

Royal Institution of Naval Architects. *NAVTEC '90: International Conference on Interaction between Naval Weapon Systems and Warship Design : Heathrow Penta Hotel, London 20-21 November 1990*. London: Royal Institution of Naval Architects, 1990.

———. *Warship 2007: The Affordable Warship : 20-21 June 2007*. London: The Royal Institution of Naval Architects, 2007.

———. *Warship '90: International Symposium on the Future for Surface Warships : Heathrow Penta Hotel, London, 4,5,6 June 1990*. London: Royal Institution of Naval Architects, 1990.

Royal Navy. *The Fundamentals of British Maritime Doctrine : BR1806*. London: H.M.S.O, 1995.

Royal Navy Museum. "The Naval Regulations Collection." . http://www.royalnavalmuseum.org/info_sheets_naval_regulations.htm.

Rustici, Ross and D. Yung Christopher. *China's Out of Area Naval Operations: Case Studies, Trajectories, Obstacles and Potential Solutions*. China Strategic Perspectives ed. Vol. 3. Washington DC: Institute for National Strategic Studies National Defense University, 2010.

Sea Power Centre Australia. "RAN Admirals." Sea Power Centre Australia. http://www.navy.gov.au/history/people/ran-admirals.

———. "Ship Histories." . http://www.navy.gov.au/fleet/ships-boats-craft/available-ship-histories.

———. "Vice Admiral Sir Henry Mackay Burrell." . http://www.navy.gov.au/biography/vice-admiral-sir-henry-mackay-burrell.

Sears, Jason. "1929-1939 Depression and Rearmament." In: The Australian Centenary History of Defence Volume III. the Royal Australian Navy , edited by Stevens, David, 81-101. Melbourne : Oxford University Press, 2001.

———. "'Something Peculiar to Themselves': The Social Background of the Navy's Officers in World War II." In: The Royal Australian Navy in World War II , edited by Stevens, David. 2nd ed., 220-233. Crows Nest, N.S.W. : Allen & Unwin, 2005.

David Shackleton. "Top Level Organisation in a Warship - is it Sacrosanct." *Journal of the Australian Naval Institute,* Vol 15, no. 2, 1989: 49-55.

R. E. Shalders. "The Enforcement of Sanctions by the Multinational Naval Force - an RAN Perspective." *Journal of the Australian Naval Institute,* Vol 18, no. May Number 2, 1991: 15-22.

Sharpe, Richard, ed. *Jane's Fighting Ships 1992-93*. Surrey UK: Janes information Group, 1992.

I. M. Speedy. "The Trident of Neptune." *Journal of the Australian Naval Institute,* Vol 3, no. 6, 1977: 10-20.

Spurling, Kathryn. "1991-2001: The Era of Defence Reform." In: The Australian Centenary History of Defence Volume III. the Royal Australian Navy , edited by Stevens, David, 269-294. Melbourne : Oxford University Press, 2001.

Stavridis, James. *Destroyer Captain: Lessons of a First Command*. Annapolis, Md.: Naval Institute Press, 2008.

Stevens, David. "1901-1913: The Genesis of the Australian Navy." In: The Australian Centenary History of Defence Volume III. the Royal Australian Navy , edited by Stevens, David. Vol. III, 5-27. Melbourne : Oxford University Press, 2001.

———. *The Australian Centenary History of Defence: The Royal Australian Navy*. Vol. III. Melbourne: Oxford University Press, 2001.

———. "The Faceless Foe - Perceptions of the Enemy in Modern Battle." In: The Face of Naval Battle: The Human Experience of Modern War at Sea , edited by Reeve, John and David Stevens, 263-284. Crows Nest, N.S.W. : Allen & Unwin, 2003.

———. *In Search of a Maritime Strategy : The Maritime Element in Australian Defence Planning since 1901*. Canberra Papers on Strategy and Defence. Vol. 119. Canberra: Australian National University, 1997.

———. "Major RAN Ships 1901-2000." In: The Australian Centenary History of Defence Volume III - the Royal Australian Navy , edited by Stevens, David. Vol. III, 297-309. Melbourne : Oxford University Press, 2001.

———. *The Royal Australian Navy in World War II*. 2nd ed. Crows Nest, N.S.W.: Allen & Unwin, 2005.

———. *Strength through Diversity: The Combined Role in Operation Stabilise*. Working Papers. Vol. 20. Canberra: Sea Power Centre Australia, 2007.

Stevens, David and John Reeve, eds. *Navy and the Nation: The Influence of the Navy on Modern Australia*. Sydney: Sydney : Allen & Unwin, 2005.

———. *Southern Trident: Strategy, History and the Rise of Australian Naval Power*. Crows Nest, N.S.W.: Allen & Unwin, 2001.

Teitler, G. *The Genesis of the Professional Officers' Corps*. Beverly Hills, Calif: Sage Publications, 1977.

Carlyle Thayer A. "The Five Power Defence Arrangements: The Quiet Achiever." *Kokoda Foundation - Security Challenges,* Vol 3, no. 1, 2007: 79-96.

The Auditor-General. *Air Warfare Destroyer Program (Department of Defence - Defence Materiel Organisation)*. Performance Audit. Vol. 22 (2013-14). Canberra: Australian National Audit Office, 2014.

———. *Management of the FFG Capability Upgrade (Department of Defence - Defence Materiel Organisation)*. Performance Audit. Vol. 11 (2007-08). Canberra: Australian National Audit Office, 2007.

———. *Navy Operational Readiness (Department of Defence)*. Performance Audit. Vol. 39 (2002-03). Canberra: Australian National Audit Office, 2003.

———. *The Super Seasprite - Department of Defence*. Performance Audit. Vol. 41 (2008-09). Canberra: Australian National Audit Office, 2009.

Thompson, Mark. *Setting a Course for Australia's Naval Shipbuilding and Repair Industry*. Canberra: Australian Strategic Policy Institute, 2002.

Till, Geoffrey. "Corbett and the 1990s." In: Mahan is Not Enough The Proceedings of a Conference on the Works of Sir Julian Corbett and Admiral Sir Herbert Richmond , edited by Goldrick, James and John Hattendorf, 211-226. Newport, Rhode Island : Naval War College Press, 1993.

Till, Geoffrey. *Seapower : A Guide for the Twenty-First Century*. London ; Portland, OR: London ; Portland, OR : Frank Cass, 2004.

Tritten, J. James. *Doctrine and Fleet Tactics in the Royal Navy*. 3-00-004 ed. Norfolk Virginia: US Naval Doctrine Command, November 1994.

United Nations. "East Timor - UNMISET - Background." United Nations. http://www.un.org/en/peacekeeping/missions/past/unmiset/background.html.

United States Naval Institute. *U.S. Naval Institute Proceedings, Cumulative Index 1874-1977*, edited by United States Naval Institute. Annapolis, Md.: Annapolis, Md. : Naval Institute Press, 1982.

United States Navy. *AEGIS Combat System - Sea-Air-Space Exposition April 2013* Washington D.C. : PEO Integrated Warfare Systems., 2013.

———. "RIMPAC 2014 - RIMPAC is the World's Largest International Maritime Exercise." Commander, U.S. Pacific Fleet. http://www.cpf.navy.mil/rimpac/2014/.

———. *Underway Replenishment - NWP 4-01.4*. Naval Warfare Publication (NWP). Washington DC: United States Navy Doctrine Command, 1996.

———. "USS Mobile Bay (CG 53)." . http://navysite.de/cg/cg53.html.

US Naval Sea Systems Command. *NAVSEA Instruction 9093.1C - Combat System Ship Qualification Trials for Surface Ships* 06/053 Washington DC : Department of the Navy., 30 August 2006.

Walters, Patrick. "Targeting the Armada." *The Australian,* 19 June 2007.

Weir, Gary and Sandra Doyle, eds. *You Cannot Surge Trust - Combined Naval Operations of the Royal Australian Navy, Canadian Navy, Royal Navy and United States Navy, 1991 - 2003*. Washington DC: US Naval History and Heritage Command, 2013.

Wellings Booth, David, Geoff Cannon, and Glenn Bridgart. *Memories of CDSC (Where the Navy Went to Bits)*. Canberra: Royal Australian Navy, 2009.

Woodman, Stewart. "Defending the Moat: Maritime Strategy and Self-Reliance." In: In Search of a Maritime Strategy - the Maritime Element in Australian Defence Planning since 1901 ,

edited by Stevens, David. Vol. 119, 135-142. Canberra : Australian National University, 1997.

Woodward, Sandy. *One Hundred Days : The Memoirs of the Falklands Battle Group Commander*, edited by Robinson, Patrick. London: London : HarperCollins, 1992.

Derek Woolner. "The Purchase of the American FFG-7 Frigate in the Context of Future Equipment Policy for the Royal Australian Navy." *Journal of the Australian Naval Institute,* Vol 3, no. 3, August 1977: 17-37.

Young, Thomas-Durrell. "ANZUS Naval Relations, 1951-85." In: Reflections on the Royal Australian Navy , edited by Frame, T. R., J. V. P. Goldrick and P. D. Jones, 296-315. Kenthurst N.S.W. : Kangaroo Press, 1991.

Young, Thomas-Durell. *The Diplomatic and Security Implications of ANZUS Naval Relations, 1951-1985*. Vol. Working Paper 163. Canberra: Australian National University, 1988.

Yule, Peter and Derek Woolner. *The Collins Class Submarine Story: Steel, Spies and Spin*. Port Melbourne, Vic.: Cambridge University Press, 2008.

Katherine Ziesing. "Daring and Perth: Ops Rooms and Upgrades." *Australian Defence Magazine,* Vol 22, no. 3, March 2014: 14-20.

II Unpublished

Lax, Mark R. "Australia's Strategic Weapon: How the F-111 Changed the Royal Australian Air Force and Australian Defence Policy." PhD Thesis, UNSW Canberra, 2011.

Spurling, Kathryn. "Life in the Lower Deck of the Royal Australian Navy 1911-1952." PhD Thesis, UNSW Canberra, 1999.

Sears, Jason. "Something Peculiar to Themselves? A Social History of the Executive Branch Officers of the Royal Australian Navy, 1913-50." PhD Thesis, UNSW Canberra, 1997.

Wallace, Roy. "The Australian Purchase of Three United States Guided Missile Destroyers: A Study of the Defense Aspect of Australian-American Relations." PhD Thesis, Tufts University, 1980.

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Appendices to Thesis

The following Appendices are provided in support of material contained in the main body of the thesis.

Appendix	Title
A	RAN Major Combatants – A Summary of Change 1961-2002
B	Professional Excellence – DDGs and the Gloucester Cup
C	RAN Options for Modifying the Adams Class
D	Chronological Summary of Events
E	Tables and Graphs for Senior Officer Promotion
F	Officers of the RAN Promoted to Star Rank 1971 to 2001
G	Commanding Officers of DDG reaching Star Rank: 1971 to 2001
H	Interview Structure and Questions
I	Interviews Conducted for Research
J	Sources Provided to Sea Power Centre Australia
K	DDGs and Exercise RIMPAC
L	Comprehensive list of Terms and Abbreviations

Figure 5: Left to right – HMAS *Hobart, Perth and Brisbane* (courtesy of RAN)

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Appendix A RAN Major Combatants – A Summary of Change 1961-2002

RAN Major Surface Combatants 1961-1999

Introduction of the USN DDGs into the RAN marked commencement of a comprehensive change in its force structure from being comprised exclusively of ships with an RN design heritage toward a force mainly of USN-origin. From 1965 onwards the character of the RAN changed through the transition of the RN design heritage to a point just prior to 2001 when the DDGs left service, by which time the RAN's destroyers and frigates had become overwhelmingly of American design.[1]

The major warships of the RAN were its surface combatants and the aircraft carrier *Melbourne,* and converted aircraft carrier *Sydney* whilst it was in service. For this examination, support ships, submarines and other vessels are not regarded as major warships on the basis that, whilst important vessels of the RAN, they did not have the ability to fight in all three dimensions of the naval environment. The importance and capabilities of surface combatants are referred to in multiple contexts in RAN doctrine.[2]

In 1961, when the Government decided to acquire two Charles F. Adams class DDGs from the United States, the major warships of the RAN at that time were as shown in Table A-1.

Table A-1 RAN Major Warships 1961

Country/Name/Class	Battle	Daring	Majestic	Q Class	River	Total
UK						
Melbourne II			1			1
Anzac II	1					1
Queenborough				1		1
Vampire II		1				1
Vendetta II		1				1
Parramatta III					1	1
Yarra III					1	1

[1] Details for the contents of tables in this Appendix have been derived from information shown in the RAN Centenary of History with amplification from the official RAN web site as appropriate. The country as shown in the left column of each of the tables is the country of origin for design of the ship. See: David Stevens, ed., *The Australian Centenary History of Defence: The Royal Australian Navy*, Vol. III Melbourne: Oxford University Press, 2001, Appendix 1 and "Ship Histories," http://www.navy.gov.au/fleet/ships-boats-craft/available-ship-histories

[2] Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2000*, 1st ed. Canberra, ACT: Defence Publishing Service, 2000 and Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2010*, 2nd ed. Canberra, ACT: Sea Power Centre Australia, 2010

Country/Name/Class	Battle	Daring	Majestic	Q Class	River	Total
Voyager II		1				1
UK Total	1	3	1	1	2	8
Total	**1**	**3**	**1**	**1**	**2**	**8**

Perth II[3] was commissioned in the United States in July 1965, *Hobart II* in December the same year, and *Brisbane II* in December 1967. By the mid-1960s four of the eventual six ships of the River class had been built in Australia to an adapted RN design.[4] *Anzac* and *Queenborough* became training support ships, and the overall force structure of major warships by 1967 came to a total of 12 as shown in Table A-2, of which 9 were of RN-origin.

Table A-2 RAN Major Warships 1967

Country/Name/Class	Daring	Majestic	River	Adams	Total
US					
Brisbane II				1	1
Hobart II				1	1
Perth II				1	1
USA Total				3	3
UK					
Melbourne II		1			1
Sydney III		1			1
Duchess	1				1
Vampire II	1				1
Vendetta II	1				1
Derwent IV			1		1
Parramatta III			1		1
Stuart II			1		1
Yarra III			1		1
UK Total	3	2	4		9
Total	**3**	**2**	**4**	**3**	**12**

With Australian decisions leading ultimately to acquire six Perry class FFGs from the USN, two of which were constructed in Australia with some assistance by the United States, by 1995 and

[3] The amplifying heritage number is shown here to distinguish between ships of the same name. See: Conventions.

[4] David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, pages 189-190

as shown in Table A-3, the balance of the fleet had moved further in the direction of the USN. Of the 11 destroyers and frigates in service with the RAN, 9 were now of USN-origin.

Table A-3 RAN Major Warships 1995

Country/Name/Class	River	Adams	Perry	Total
USA				
Adelaide II			1	1
Canberra II			1	1
Darwin			1	1
Melbourne III			1	1
Newcastle			1	1
Sydney IV			1	1
Brisbane II		1		1
Hobart II		1		1
Perth II		1		1
USA Total		3	6	9
UK				
Swan III	1			1
Torrens II	1			1
UK Total	2			2
Total	**2**	**3**	**6**	**11**

Following the decommissioning of the last DDG (*Brisbane*) in 2001,[5] by the year 2002 the RAN had commissioned four of eight Anzac class frigates constructed to a modified German design of the Meko class, and it continued to have six ships of the Perry class FFG in service, of which four were to undergo a major program of modernisation. As shown in Table A-4, by 2002 there were no destroyers or frigates of RN-origin still in service with the RAN, the last of which (*Torrens*) decommissioned in 1998.[6]

Table A-4 RAN Major Warships 2002

Country/Name/Class	Anzac	Perry	Total
Germany			
Anzac III	1		1
Arunta II	1		1

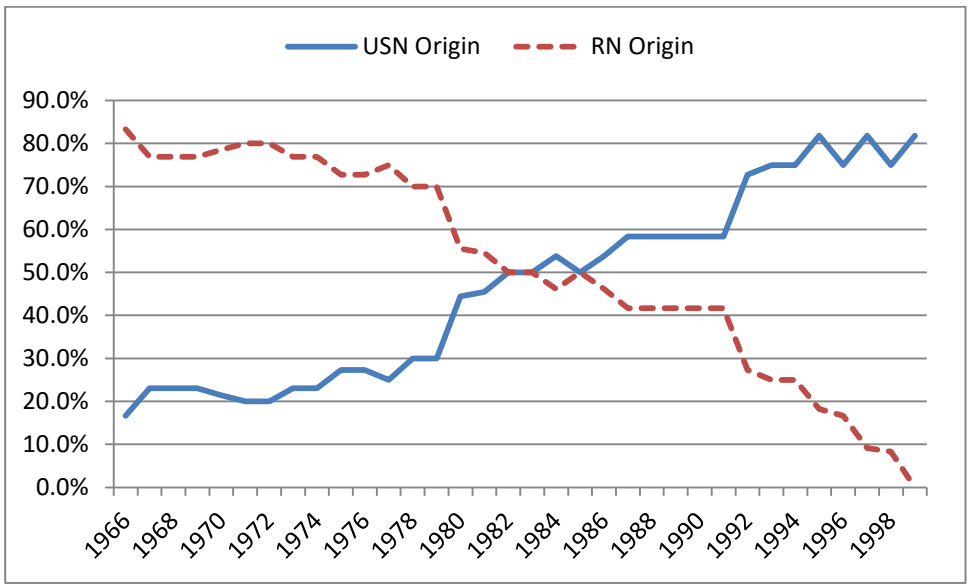
5 Sea Power Centre Australia, *Ship Histories*

6 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, Appendix 1

Country/Name/Class	Anzac	Perry	Total
Stuart III	1		1
Warramunga II	1		1
Germany Total	4		4
USA			
Adelaide II		1	1
Canberra II		1	1
Darwin		1	1
Melbourne III		1	1
Newcastle		1	1
Sydney IV		1	1
USA Total		6	6
Total	**4**	**6**	**10**

Figure A-1 shows the progressive transition of RN-origin surface combatants to those of USN-origin.

Figure A-1 Summary of RAN change from RN to USN Major Surface Combatants 1965-1999



RAN Force Structure 1965-2002 Ships and Submarines

Whilst surface combatants constituted the most significant change to the RAN force structure, the RAN also acquired two-second hand amphibious ships from the USN and an afloat support ship from the RN to complement those already had in service. Following departure of the DDGs from service, by the year 2002 the RAN was in the process of introducing the Collins class submarines as well as the Anzac frigates. But from its earlier reliance on the RN, and then

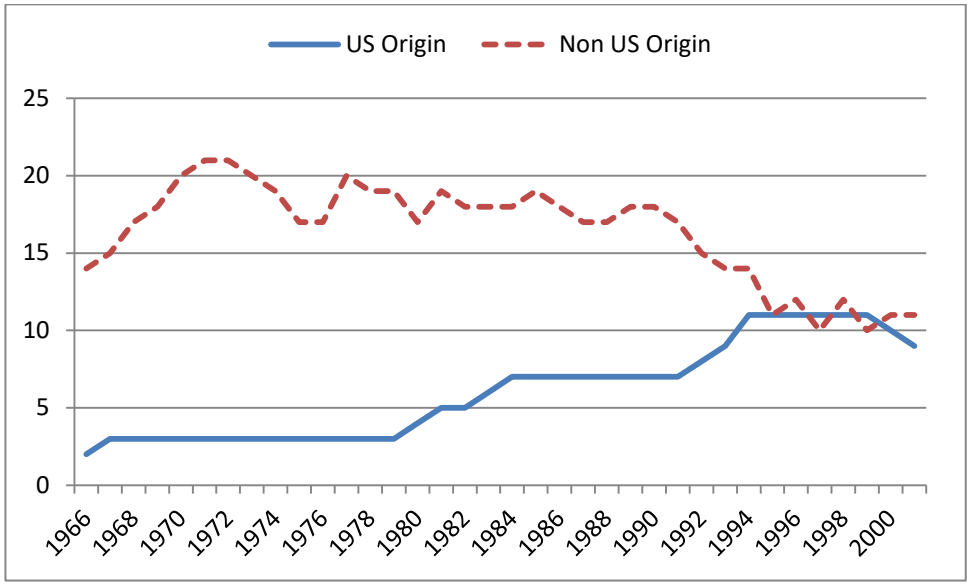
the USN, the RAN had become the owner of vessels with their origins in six different countries as summarised in Table A-5.

Table A-5 Classes of Ship and Country of Origin Operated by the RAN in 2002

Country & Class	Anzac	Durance	Perry	Tobruk	Leaf (Mod)	Leeuwin	Collins	Newport (Mod)	Grand Total
Germany	4								4
Sweden							3		3
France		1							1
USA			6					2	8
UK				1	1				2
Australia						2			2
Grand Total	**4**	**1**	**6**	**1**	**1**	**2**	**3**	**2**	**20**

The progressive transition of RAN ships and submarines from RN to a broader international basis over the period 1966 to 2002 is summarised in Figure A-2.

Figure A-2 US Origin and non US Origin Ships and Submarines



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Appendix B Professional Excellence - DDGs and the Gloucester Cup

Introduction

Since 1947, the annual prize for attainment of the highest standard of overall professional operational performance in the RAN has been the award of the Duke of Gloucester Cup, presented by the Duke to the RAN in 1946.[1] There have been some changes to the definitions by which performance is measured, and the eligibility for award to units of the Australian Fleet has been progressively broadened, but there has been no diminution of the status it bestows on the winner.[2] The initial winner of the Gloucester Cup was the first HMAS *Hobart*,[3] a light cruiser.

The changing character of the RAN as it introduced new classes of ships and took others out of service was reflected in the changing classes of units winning of the Cup. A comparison of winners over time however, makes it possible to make some broad assessments about the results. The DDGs were consistent winners of the Cup and accordingly it is also possible to make some generalisations concerning the DDGs and their relative performance against contenders.

Gloucester Cup Winners by Ship Class

For the period between 1947 and 1966, by which time *Perth II* had been commissioned and became eligible, the distribution of winners by ship name and class of ship is shown in Table B-1. A general comparison of performance can be inferred between the Majestic Class aircraft carriers, the Daring Class destroyers and the *Q* Class as the setters of Fleet standards of professional performance.

Table B-1 Gloucester Cup Winners: 1947 - 1966

Ship/Class	Battle	County	Daring	Leander Mod	Majestic	Q Class	River	Tribal	River (Mod)
Anzac II	1								
Arunta I								1	

1 Royal Australian Navy, *His Royal Highness the Duke of Gloucester Cup Awards (SPC.DS.23),* Commonwealth Navy Order 654/54 Canberra: Sea Power Centre Australia.

2 Royal Australian Navy, *Australian Fleet Awards. Dated 6 November 2011. (SPC.DS.22),* Fleet File S4582123 Canberra: Sea Power Centre Australia.

3 Royal Australian Navy, *Gloucester Cup Winners 1947-2011. Dated 2013. (SPC.DS.24),* Canberra: Sea Power Centre Australia.

Ship/Class	Battle	County	Daring	Leander Mod	Majestic	Q Class	River	Tribal	River (Mod)
Australia II		1							
Hawkesbury I							1		
Hobart I				1					
Melbourne II					2				
Murchison									1
Quadrant						2			
Queenborough						1			
Quickmatch						1			
Shoalhaven									1
Sydney III					3				
Vampire II			3						
Vendetta II			1						
Grand Total	**1**	**1**	**4**	**1**	**5**	**4**	**1**	**1**	**2**

Table B-2 lists the winners of the Cup between 1966 and 2001 when the last of the DDGs was decommissioned.[4]

Table B-2 Gloucester Cup Winners: 1966 - 2001

Ship/Class	Adams	Anzac	Durance	Majestic	Oberon	Perry	River	Tobruk	Stalwart	Tide	Training
Adelaide II						2					
Anzac III		1									
Arunta II		1									
Brisbane II	3										
Canberra II						1					
Darwin						3					
Derwent							1				
Hobart II	8										
Jervis Bay											1
Melbourne II				1							
Onslow					1						
Orion					1						

[4] Details in the table have been compiled from RAN information. Royal Australian Navy, *Gloucester Cup Winners 1947-2011. Dated 2013. (SPC.DS.24),* Canberra: Sea Power Centre Australia.

Ship/Class	Adams	Anzac	Durance	Majestic	Oberon	Perry	River	Tobruk	Stalwart	Tide	Training
Perth II	1										
Stalwart II									2		
Stuart II							2				
Success			2								
Supply										1	
Swan III							1				
Sydney III				1							
Sydney IV						1					
Tobruk II								1			
Torrens II							1				
Grand Total	**12**	**2**	**2**	**2**	**2**	**7**	**5**	**1**	**2**	**1**	**1**

In the period 1966 to 1981 (inclusive) after which the first FFG (*Adelaide*) became eligible, a DDG won the Cup in seven of the 16 years (approximately 44%) with ships of the River class winning 4 times (approximately 25%). Between 1982 and 1999 when the first of the DDGs decommissioned, a DDG won the Cup 5 times out of the 19 it was awarded (approximately 26%), with an FFG winning seven out of the 19 (approximately 37%). *Hobart* and *Darwin* were jointly the winning ships in 1994. *Derwent* was the last RN-origin surface combatant to win the Cup in 1989, and *Brisbane* II was the last DDG to win the Cup in 1996.

In overall terms, between 1966 and 2001 when the last of the DDGs left service, the DDGs as a class won the Cup 12 out of the 37 times it was awarded (approximately 32%). The *Adams* were a class of three ships and, as shown in Appendix A, at its greatest, represented only one third of the RAN surface combatant force. The Perry FFGs were a class of six ships, as were the Rivers. In proportional terms, the inference from Table B-2 is that for much of the period of their operational service, the DDGs represented the standard of professional operational excellence in the RAN. This finding is consistent with the oral evidence of personal experiences researched in the thesis.

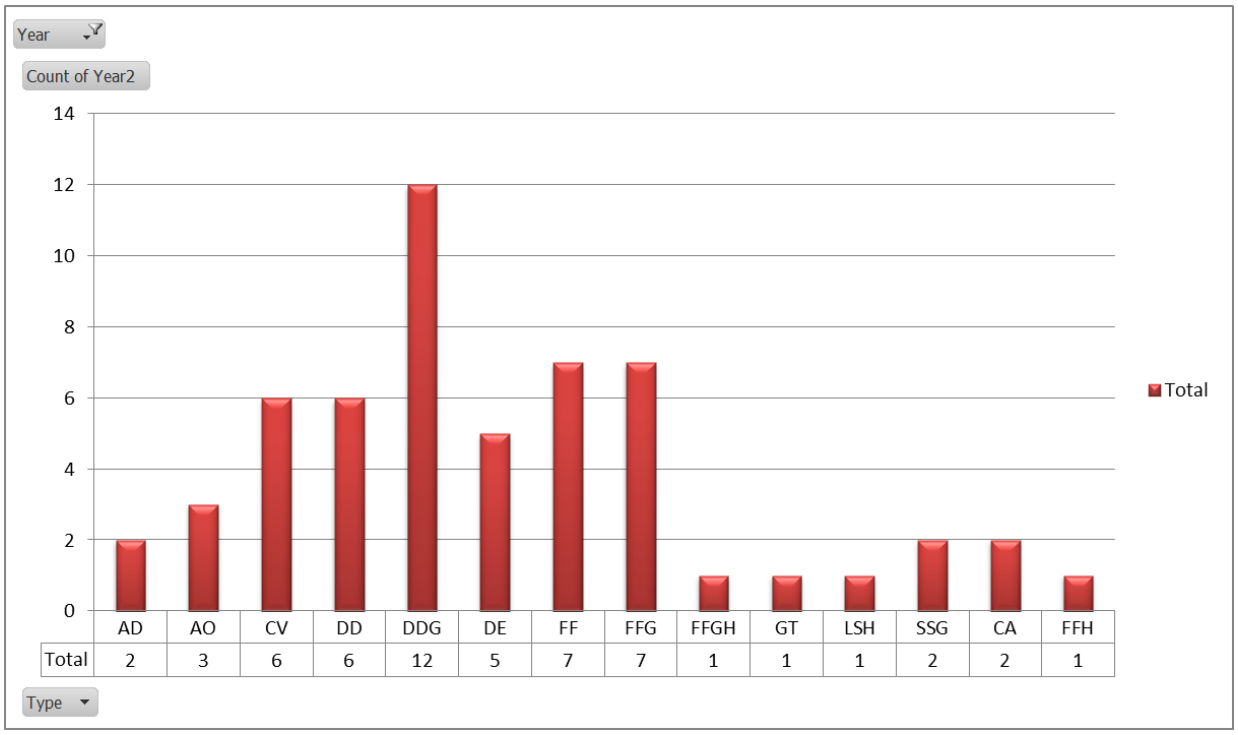
With regard to overall leadership performance as measured by the number of times the Cup was won by an individual ship, the DDG *Hobart* held the prize. *Hobart* was first awarded the Cup in 1967, the first of 8 times the ship was so recognised, a performance unequalled by any other unit in the period of 54 years from 1947 to 2001. The DDG *Brisbane* won the Cup three

times and DDG *Perth* once in the same period.[5] The disparity of achievements between the three ships is striking, but not readily explicable because the sample is small and other factors such as whether the ship had a demanding operational program or not, the calibre of its men and the ability of their Commanding Officers were all considerations in the Fleet Commander's assessment process.

Gloucester Cup Winners by Ship Type

Between 1947 and 2001 the DDGs outperformed all other vessel Types[6] of the RAN in award of the Gloucester Cup as shown in Figure B-1.[7]

Figure B-1 Gloucester Cup Ship Winners by Type 1947 - 2001



[5] Royal Australian Navy, *Gloucester Cup Winners 1947-2011. Dated 2013. (SPC.DS.24),* Canberra: Sea Power Centre Australia. Pages 1-2

[6] See Conventions used in the thesis.

[7] Ship Type abbreviations are contained in Appendix L

Appendix C RAN Options for Modifying the Adams Class

Options for Changing the Adams Class Design

The RAN developed five options to modify the design of the Adams class and sought advice from the USN as to their technical feasibility and estimated cost. They are shown in Table C-1.[1] The purpose of having the USN explore these options behalf of the RAN was to ascertain how closely it would be possible to meet the preferences of the Australian Naval Staff.

Table C-1: RAN Options to Modify Design of Adams Class

Version	Configuration	RAN Comment
Alpha	As is in USN service	Cost is firm and would involve no increase No redesign involved thus not delay in delivery
Bravo	Do not fit ASROC Fit Ikara in lieu	Fitting Ikara in lieu of ASROC will be critical for space and may involve a reduction in the number of missiles carried from 24 to 20 As Ikara would be sided, firing on certain bearings it would create a blast factor
Charlie	Do not fit ASROC fit Ikara in lieu Fit VDS	Confirmation is required on practicability of fitting VDS – weight and strength factors Increased cost on Alpha and Bravo Top weight may be critical – could be reduced by smaller outfit of Ikara missiles Displacement may be difficult

[1] This Table replicates the information provided to the USN by the RAN. The comments are those made by the RAN in regard to the configuration option they were seeking advice on. See: Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder BU (Vice Admiral Henry Burrell RAN) Washington DC: United States Navy. Letter Burrell to Burke dated 18 November 1960

Version	Configuration	RAN Comment
Delta	Remove 1 – 5" gun Replace ASROC with Ikara Fit VDS Carry two A/S helicopters and fit stabilisers (landing space and hangar for 1 helicopter) Mover Tartar approximately 55 feet forward	Best arrangement to meet RAN Staff Requirements without altering main machinery Is it practicable to move Tartar forward? Likely to be more expensive Displacement would be a critical factor Likely top weight problem Probably very critical all round
Echo[2]	Remove 1 – 5" gun Replace ASROC with Ikara Fit VDS Carry two A/S helicopters and fit stabilisers (landing space and hangar for 1 helicopter) Reduce power to 40,000 HP (involves removal of one funnel and rearrangement of main propulsion machinery) Mover Tartar approximately 55 feet forward	Best arrangement to meet RAN Staff Requirements Helicopter could be moved forward past Tartar launcher Necessary considerable redesign would presumably involve delay and additional cost though this could be partly offset by reduced main machinery costs.

Suggestions to Define RAN Staff Requirements for Helicopter Operations

The RAN had not operated helicopters from other than larger ships and their potential installation in a DDG led to further consideration by the Naval Board in defining the capability required as shown in Table C-2.[3] Suggestions A and B were made to aid in clarifying what was intended by the RAN. The lack of definition at such a late stage in the finalisation of operational requirements could have been expected to cause delays to awarding a contract and would have had implications for the cost and delivery schedule of the ship.

[2] This was also known as the D.E.G 1030 propulsion option

[3] Royal Australian Navy, *Minute by 3NM: Helicopter Facilities - Charles F. Adams (3NM Suggestions). Dated 21 March 1961. (SPC.DS.6),* Navy File 1211/207/4 Canberra: Sea Power Centre Australia.

Table C-2: Suggestions A and B for Helicopter Operation

Type of Modification Proposed	Staff Requirement	Definition
Suggestion A	2 x Search/Attack A/S helicopters with Hangar and Full Support Facilities	(a) 2 x Medium helicopters fitted with Sonar and a Mark 44 torpedo (b) Hangar capable of storing 2medium helicopters (c) Full support for continuous operation of 2 medium helicopters (d) Landing Area for at least 1medium helicopter (e) In the event of 1 helicopter going U/S the handling area must permit full manoeuvrability of the other from the hangar to the flight deck
Suggestion B	2 x Search/Attack helicopters with Hangar and Reduced Support Facilities	(a) 2 medium helicopters fitted with Sonar and a Mark 44 torpedo (b) Hangar capable of storing 1medium helicopter with the other covered on deck (c) Support for continuous operation of 2 medium helicopters for periods up to 4 days, the major maintenance being carried out in an aircraft Carrier (d) Landing area for at least 1medium helicopter (e) In the event of 1 helicopter going U/S the handling area must permit full manoeuvrability of the other from the hangar to the flight deck

RAN Options to Modify Adams Class to Carry a Helicopter

After Government approval to proceed with the Adams was given, assistance was sought from the USN to advise what changes were possible that could result in the ship being able to embark a helicopter. Table C-3 summarises the RAN advice sought in April 1961, and that provided by the USN as obtained from associated correspondence.[4]

[4] United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: DDG-2 Class, Progress Report on Feasibility of Modifications Ser 440-080 dated 15 May 1961

Table C-3 RAN Options to Achieve DDG Helicopter Capability

RAN Option/Advice Sought	USN Advice
Two helicopters of the HU2K[5] type with hangar space for one helicopter	Incorporation of a helicopter would require removal of the aft gun mount (Mount 52) but serious blast problems would be introduced through re-location of the Tartar launcher, requiring redesign of the after deckhouse and helicopter hangar door.[6]
Bow mounted sonar	Consideration was given to substituting the AN/SQS-23 in the Adams Class with the AN/SQS-26, but a brief study noted the much greater electrical power requirement as well as requiring an additional 200 square feet of space. This would require a major re-design of the sonar control room and changes to the C-I-C. It was not impossible but technically risky and expensive.[7]
Feasibility of using the DDG-2 hull and changing the machinery to that used in the DE 1037 Class[8]	Use of the DE 1037 propulsion system was assessed as permitting location of an Ikara magazine below upper deck level and between machinery spaces, but this would be a very tight fit and crew accommodation space would be lost. Adoption of a single funnel would negate the benefits of having a two shaft propulsion arrangement in separated compartments. Location of Ikara at the stern of the ship would introduce blast problems with the VDS and helicopter arrangements from missile rocket motor efflux. The changes were considered possible but would not substantially change the total price estimated for a DDG-2 and the range of the ship would be less through the reduction in fuel carried. Overall it was not regarded as a sensible proposition.[9]

5 HU2K – designation for the early versions of the Sea Sprite naval helicopter – which became the SH-2

6 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: DDG-2 Class, Progress Report on Feasibility of Modifications Ser 440-080 dated 15 May 1961

7 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: Feasibility Study (AN/SQS -26 in DDG-2 Class) Ser 440-0186 dated 18 October 1961

8 DE 1037 was the nomenclature for the two ships of the Bronstein Class. USS *Bronstein* was FF 1037.

RAN Option/Advice Sought	USN Advice
Variable depth sonar (VDS) type AN/SQA-11	AN/SQA-11 was intended to be used in conjunction with AN/SQS-23 and provide simultaneous hull/VDS operation.[10] The 19 ton future development margin of the Adams Class was inadequate to incorporate VDS and removal of the after gun would be required to maintain hull integrity. Installation would also impact on Tartar which would impose restrictions on the direction and elevation at which the missile could be launched without damaging the VDS. A means of reducing the weight of the ships had not been found but had considered the use of AN/SQA-13 as a lighter weight alternative to the AN/SQA-11. This was not recommended because it could not operate in a simultaneous mode with AN/SQS-23 and funding was not available.[11]

USN Diagrams of Alternative Option Echo Configurations

The USN produced schematic diagrams to summarise the changes necessary to accommodate the requirements of Option Echo should they be adopted by the RAN. Two such diagrams were located at NARA,[12] but the image quality is poor.

Figure C-1 shows the ASW variant of the Adams Class having a reduced capability propulsion system (40,000 shaft horsepower)[13] and a single funnel. The VDS unit is located at the stern with a helicopter landing area where the after gun (Mount 52) has been removed. A hangar is located on the port side. The Tartar launcher is shifted forward, causing the blind arc firing problem highlighted by the USN. The Ikara magazine is shown between the forward engine room and the after fire room, having an elevator to transport missiles to the launcher located in place of the USN ASROC mounting which it replaces.

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9 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: DDG-2 Class, Progress Report on Feasibility of Modifications Ser 440-080 dated 15 May 1961

10 United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: Sonar improvements in combatant ships Ser 452-0110 dated 20 April 1961

11 ibid

12 United States Navy, *Records of the Bureau of Ships* Box 60 Folder C-DDG2C1/9240 through C-DDG2C1/9780 Vol1. Chief Bureau of Ships Memorandum: DDG-2 Class, Progress Report on Feasibility of Modifications Ser 440-080 dated 15 May 1961.

13 The normal propulsion system produced 75,000 shaft horsepower.

Figure C-1 Option Echo Layout of ASW Modified Adams Class – Single Funnel

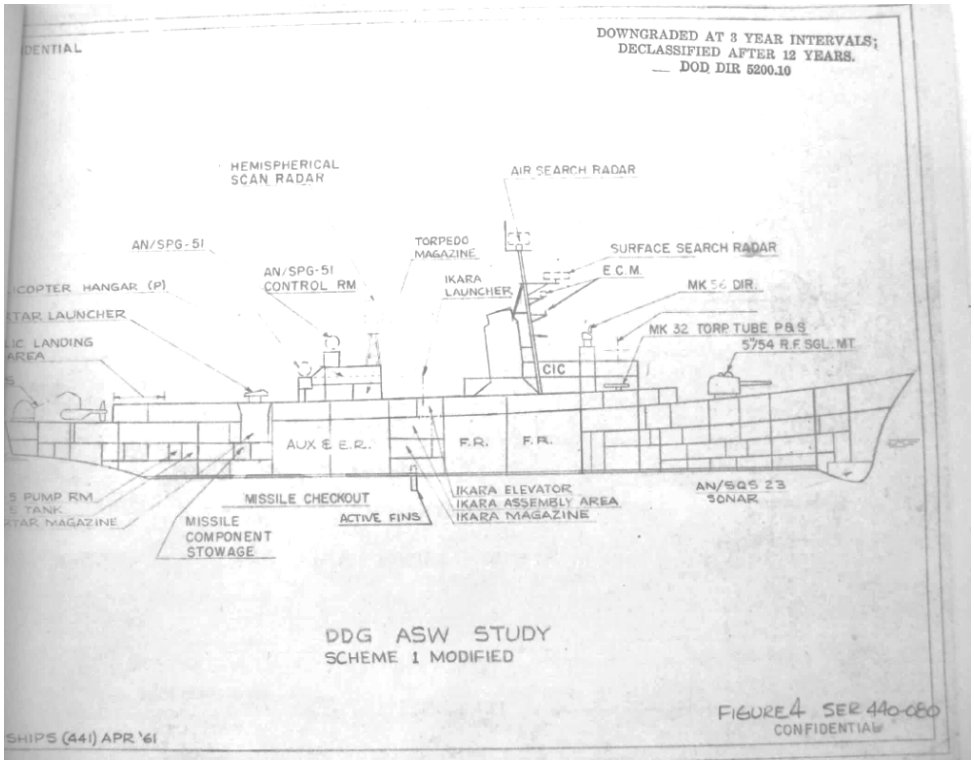
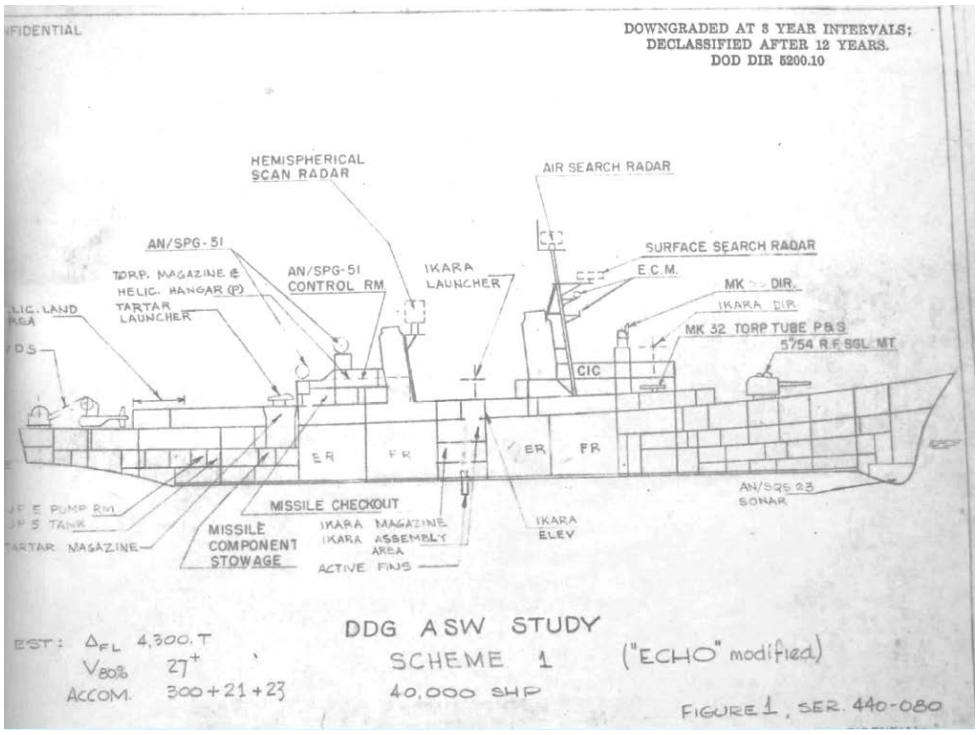


Figure C-2 shows the twin funnel variant of Option Echo of the reduced power variant which also incorporates the other changes of VDS, Mount 51, helicopter deck and hangar, and Tartar.

Figure C-2: Option Echo Layout of ASW Modified Adams Class – Twin Funnel



Appendix D Chronological Summary of Events

Overview

The thesis has been structured thematically, hence the following chronology is intended to illuminate the case study of the DDGs by placing their service in strict historical context for purpose of reference.

The dates and events in the following table provide a summary of those incorporated in the thesis. Where a month of the year for the event is not available from the evidence, the date given is the year of the event. The relevant footnote provides the source for the particular event.

Table D-1: Chronological List of Dates and Events

Date	Event	Footnote
1949	RAN CNS Vice Admiral John Collins accepts that the light carrier *Melbourne* cannot carry modern aircraft but remains intent on establishing Fleet Air Arm.	1
1953	Trials of Seaslug missiles commence at Woomera under auspices of Anglo-Australia Joint Project (1946-1980).	2
January 1953	COSC Strategic Assessment of Australian entering prolonged period of security difficulty.	3
September 1954	Minister for Defence McBride announces adoption of Long Haul Defence Policy to ensure priorities and funding are matched. Gives an ASW priority to RAN.	4
March 1956	RN finalises the design of the County/Hampshire class destroyers.	5
March 1956	CNS Vice Admiral Roy Dowling writes to CNO Admiral Burke indicating that RAN could switch to USN guided weapons.	6
March 1956	CNS Dowling writes to RN First Sea Lord Admiral Mountbatten indicating possibility of RAN acquiring USN weapons.	7

1 James Goldrick, "Carriers for the Commonwealth," in *Reflections on the Royal Australian Navy*, eds. T. R. Frame, J. V. P. Goldrick and P. D. Jones (Kenthurst N.S.W.: Kangaroo Press, 1991), 220-244, page 236

2 Peter Morton, *Fire Across the Desert: Woomera and the Anglo-Australian Joint Project 1946-1980* Canberra: AGPS Press, 1989, page 143

3 Stephan Frühling, *A History of Australian Strategic Policy since 1945* Canberra: Defence Publishing Service, 2009, page 12

4 H. J. Donohue, *From Empire Defence to the Long Haul: Post-War Defence Policy and its Impact on Naval Force Structure Planning, 1945-1955* Canberra: RAN Maritime Studies Program, 1996, page 137

5 Norman Friedman, A. D. Baker and Alan Raven, *British Destroyers & Frigates: The Second World War and After* London: Chatham Publishing, 2006, page 184

6 Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder DJ-DOX (Vice Admiral Roy Dowling RAN) Washington DC: United States Navy. Letter Dowling to Burke USN dated 12 March 1956

7 Alastair Cooper, "The Development of an Independent Navy for Australia: Correspondence between the First Naval Member and the First Sea Lord 1947-59," in *The Naval Miscellany*, ed. Susan Rose, Vol. VII (Farnham: Ashgate Press, 2008), 511-670, page 631

Date	Event	Footnote
4 April 1957	Prime Minister Menzies announces that Australia would probably be fighting with America in the South East Asian region and Australia would adopt a policy of logistic interoperability with United States.	8
23 August 1957	US Presidential determination that US would urge Australia to progressively standardise its military equipment on US models and facilitate Australian purchases.	9
November 1958	Senator John Gorton becomes Minister for the Navy.	10
January 1959	COSC Strategic Assessment of threat posed by Indonesia and recommendation that Australia should be able to operate independently of Allies.	11
February 1959	CNS Dowling considered that the RAN could not meet its operational responsibilities because of lack of funds.	12
February 1959	Vice Admiral Henry Burrell becomes CNS	13
March 1959	CNS proposes development of a long range plan for the RAN.	14
April 1959	Gorton advises Minister for Defence (Mr Townley) that RAN had alarming deficiencies and was ill prepared for any serious operational role in the Asian region.	15
May 1959	Burrell advises Burke of intended re-equipment program for RAN and his interest in guided missile destroyers.	16
June 1959	Townley seeks advice from Australian Ambassador to United States (Sir Howard Beale) on availability of second hand USN warships for RAN.	17

[8] Commonwealth of Australia. *CPD [Reps] Vol 14, 4 April 1957.* Page 573

[9] United States Department of State, *General Records of the Department of State*, Vol. Record Group 59 (College Park, Maryland: US National Archives and Records Administration) Box 1684 Folder 743.56/2-1960. State Department Deputy Coordinator for Foreign Assistance Memorandum: dated 11 May 1961

[10] "Australia's Prime Ministers (John Grey Gorton)," National Archives of Australia, http://primeministers.naa.gov.au/primeministers/gorton/before-office.aspx

[11] Stephan Frühling, *A History of Australian Strategic Policy since 1945*, page 17

[12] Royal Australian Navy, *Vice Admiral Sir Roy Dowling RAN - Brief Report on Relinquishing the Post of First Naval Member and Chief of Naval Staff. Dated 23 February 1959. (SPC.DS.36.1),* Canberra: Sea Power Centre Australia.

[13] David Stevens, ed., *The Australian Centenary History of Defence: The Royal Australian Navy*, Vol. III Melbourne: Oxford University Press, 2001, page 311

[14] Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 6 March 1959*, Vol. NAA: A2585, 1954 - 1960 (Canberra: National Archives of Australia)

[15] Ian Hancock, *John Gorton: He did it His Way* Sydney: Hodder, 2002, page 87

[16] Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder BU (Vice Admiral Henry Burrell RAN) Washington DC: United States Navy. Letter Burrell to Burke dated 27 May 1959

[17] Commonwealth of Australia, *US Naval Vessels for Australia*, Vol. NAA: A3092, 221/4/9/7/1 (Canberra: National Archives of Australia) Personal letter from Minister Townley to Ambassador Beale dated 19 June 1959

Date	Event	Footnote
July 1959	Naval Board agreed to introduction of submarine service, minesweepers and surface to air guided weapon destroyers and submission be made for ensuing three year program.	18
August 1959	Ambassador in United States notifies Townley that CNS Burrell has been corresponding with CNO.	19
November 1959	Minister Townley announces fixed wing aircraft of FAA will not be replaced when at end of life in 1963. *Melbourne* was to be withdrawn from service.	20
January 1960	CNS Burrell conducts visit of UK, Canada and US to examine options for RAN.	21
January 1960	Burrell is directed by Secretary Australian Department of Defence not to investigate options to replace *Melbourne* while on overseas fact-finding mission.	22
March 1960	RN First Sea Lord Admiral Lambe briefed by Naval Board that the RAN had selected Tartar over Seaslug (before the Minister for Defence makes an announcement).	23
March 1960	Townley announces results of Burrell's visit are being evaluated.	24
June 1960	Naval Board discusses option of modifying RN County class to carry the Tartar missile system.	25
June 1960	USN policy decision not to fit small version of NTDS during construction of last batch of Adams class.	26
July 1960	Navy Program proposal for 1960. Seeking two modified Hampshire class, ASW helicopters and extension of *Melbourne* amongst others	27
August 1960	Burrell recommends and COSC agrees to seek a modified *Hampshire* class for the RAN (Tartar to replace Sea Slug)	28
October 1960	Australian Government announces that results of Burrell visit are still under consideration.	29

[18] Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 3 July 1959*, Vol. NAA: A2585, 1954 - 1960 (Canberra: National Archives of Australia)

[19] Commonwealth of Australia, *US Naval Vessels for Australia*, Personal letter from Ambassador Beale to Minister Townley dated 5 August 1959.

[20] Commonwealth of Australia. *CPD [Reps] Vol 48, 26 November 1959.* Page 3183

[21] Commonwealth of Australia. *CPD [Reps] Vol 48, 27 November 1959.* Page 3296

[22] Henry Burrell et al., *Mermaids do Exist* South Melbourne: Macmillan, 1986 Page 252

[23] Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 18 March 1960*, Vol. NAA: A2585, 1954 - 1960 (Canberra: National Archives of Australia)

[24] Commonwealth of Australia. *CPD [Reps] Vol 13, 29 March 1960.* Page 649

[25] Commonwealth of Australia, *Naval Board Minutes, 1954-1960: Meeting of 3 June 1960*, Vol. NAA: A2585, 1954 - 1960 (Canberra: National Archives of Australia)

[26] United States Navy, *Records of the Bureau of Ships,* Record Group 19 College Park, Maryland: US National Archives and Records Administration. Box 42 Folder C-DDG2Class/9320 1/1/60. Memorandum: for Chairman Ship Characteristics Board Ser 044P93 dated 15 June 1960 (NTDS in Destroyers)

[27] Commonwealth of Australia, *Navy Program Proposals July 1960*, Vol. NAA: A1945, 84/3/4 ATTACHMENT B (Canberra: National Archives of Australia)

[28] Commonwealth of Australia, *Navy Program of July 1960*, Vol. NAA: A8447,67/1960 (Canberra: National Archives of Australia), page 6

[29] Commonwealth of Australia. *CPD [Reps] Vol 41, 11 October 1960.* Page 1855

Date	Event	Footnote
November 1960	Cabinet gives approval to acquire two Adams class DDGs from the United States (*Perth* and *Hobart*).	30
November 1960	Burrell writes to Burke seeking assistance with 5 RAN options to satisfy surface to air missile requirements and modifying Adams class to carry a helicopter.	31
December 1960	Burke responds to Burrell advising on how the acquisition of Adams class could be handled on a navy-to-navy basis.	32
March 1961	Third naval member seeks clarification of helicopter requirement in Adams class because there was no statement of operational requirement.	33
March 1961	Burrell seeks finalisation of staff requirements for Adams class. A variety of different configurations had been developed to adapt the ship to be similar to the Adams class. Except for replacement of ASROC with Ikara and some accommodation and navigation changes, all proposals for major change were dispensed with.	34
March 1961	Negotiations take place with the USN for acquisition of two Adams class.	35
April 1961	USN conducts successful multi-ship trial of NTDS and its High Frequency radio data link (the UHF Link failed testing). Approval given by CNO to proceed with wide fitting across the USN.	36
May 1961	US Department of State makes offer to Australia for it to acquire two Adams class ships.	37
July 1961	Australian purchase of two Adams class DDG announced by Gorton.	38
August 1961	Burrell advises Australian Secretary of Department of Defence to accept the American offer for Australian purchase of two Adams class 'as is'.	39

[30] Commonwealth of Australia, *Three Year Naval Defence Program - 1962-1963 to 1964-1965*, Vol. NAA: A7942, D114 PART 2B (Canberra: National Archives of Australia)

[31] Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection* Letter Burrell to Burke dated 18 November 1960

[32] Archives Branch US Naval History and Heritage Command, *Admiral Arleigh Burke Personal Papers Collection,* Folder BU (Vice Admiral Henry Burrell RAN) Washington DC: United States Navy. Letter Burke to Burrell 23 December 1960

[33] Royal Australian Navy, *Minute by 3NM: Helicopter Facilities - Charles F. Adams (3NM Suggestions). Dated 21 March 1961. (SPC.DS.6),* Navy File 1211/207/4 Canberra: Sea Power Centre Australia.

[34] Royal Australian Navy, *Minute CNS to DCNS & 3NM: Charles F. Adams - Finalisation of Requirements. Dated 23 March 1961. (SPC.DS.7),* Canberra: Sea Power Centre Australia.

[35] Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, Vol. NAA: A3092, 221/4/9/7/2 (Canberra: National Archives of Australia), Australian Embassy Washington D.C. Telegram dated 17 March 1961

[36] David L. Boslaugh, *When Computers Went to Sea* Los Alamitos, California: IEEE Computer Society, 1999, page 258

[37] Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, State Department Deputy Coordinator for Foreign Assistance Memorandum: dated 11 May 1961

[38] "US Methods may be Adopted by RAN," *Sydney Morning Herald,* 1961, Page 7

[39] Royal Australian Navy, *Minute CNS to Secretary Department of Defence concerning S.A.G.W. Escorts. Dated 30 August 1961. (SPC.DS.25),* Navy File 1217/201/76 Canberra: Sea Power Centre of Australia.

Date	Event	Footnote
October 1961	Government announces *Melbourne* to remain in service as an ASW carrier.	40
26 October 1961	Australia places order for two Adams class destroyers from the USN.	41
January 1962	Contract signed by USN and Defoe Shipyard for construction of two Adams class DDG for Australia.	42
January 1962	Rear Admiral James – USN Bureau of Ships – visits Australia to discuss procurement of Adams class.	43
September 1962	Tartar performance is unsatisfactory and CNO declares a 'holiday' on development of Tartar so that it can be made reliable. It lasted until 1965.	44
January 1963	Cabinet approves acquisition of third DDG (*Brisbane*).	45
February 1963	Gorton visits United States to negotiate price of third Adams class destroyer. He reported that US Secretary of Defense McNamara made some agreements to the financing arrangement.	46
May 1963	Approval given to install Ikara in DDGs.	47
October 1963	Gorton irritated with US over LOA for third DDG (several disagreements occurred over funding arrangements with the US.)	48
October 1963	CPO Lloyd Cheetham announced as first RAN member to be trained on DDGs.	49
November 1964	Government announces intention to fit *Daring* destroyers with Ikara ASW system.	50
November 1964	Cabinet deletes 4th DDG proposed by the RAN from Navy program.	51

[40] Commonwealth of Australia. *CPD [Reps] Estimates 1961-62 Speech 5 October 1961.* Page 1708

[41] Commonwealth of Australia, *Australian Consulate General New York Purchase Order for 2 DDG 2 Class Destroyers. Dated 26 October, 1961 (SPC.DS.9),* Navy File 1215-201-76 Canberra: Sea Power Centre Australia.

[42] Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, British Joint Communications Office message dated 4 January 1962.

[43] "U.S.A. Visitor," *Royal Australian Navy News,* 26 January 1962, Vol5 No2, Page 12

[44] Norman Friedman, *The Naval Institute Guide to World Naval Weapons Systems* Annapolis, MD: Naval Institute Press, 1990, page 156

[45] Commonwealth of Australia, *Navy Programme Proposals. DECISION 622*, Vol. NAA: A5819,VOLUME13/AGENDUM 519 (Canberra: National Archives of Australia)

[46] Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, External Canberra Telegram dated 7 February 1963

[47] Commonwealth of Australia, *Department of Navy Three Year Program - 1965/66 to 1967/68*, Vol. NAA: A1945, 84/3/10 (Canberra: National Archives of Australia)

[48] Commonwealth of Australia, *US Destroyers for Australia (Charles F. Adams Class)*, External Canberra Telegram dated 27 September 1963

[49] "US Training for RAN Sailors," *Royal Australian Navy News,* 4 October 1963, Vol6 No20, Page 1

[50] Commonwealth of Australia. *CPD [Reps] Vol 46, 10 November 1964.*

[51] Commonwealth of Australia, *Department of Navy Three Year Program - 1965/66 to 1967/68*

Date	Event	Footnote
February 1965	CNS Vice Admiral Sir Hastings Harrington reports to Prime Minister that the Navy cannot meet its responsibilities because it is underfunded and the Indonesian navy possesses greater operational capability than the RAN.	52
March 1965	Naval Board determines that project management methods for major capital equipment needs to improve	53
April 1965	The Secretary to the PM Department is advised that Harrington's advice is sound. Also that the Navy needs an attack role but is currently an entirely defensive force.	54
July 1965	*Perth* commissions in the United States.	55
October 1965	Government commits to acquisition of A4 Skyhawks for *Melbourne*.	56
October 1965	Cabinet defers decision on acquisition of a 4th Adams class DDG.	57
October 1965	Fourth naval member does not consider acquisition of a 4th Adams class (if it should occur) warrants nomination of a project officer.	58
December 1965	*Hobart* commissions in the United States.	59
January 1966	USN commissions the Belknap class cruiser, USS *Wainwright*, the first ship to be fitted with NTDS, the SPS-48 radar and the Terrier missile system.	60
April 1966	Minister for Navy (Mr Chaney) recommends acquisition of 4th DDG.	61
July 1966	PM Department agrees with Minister for Defence that the purchase of 4th DDG be deferred. Decision 366(M) did not include provision for funding of the ship.	62

52 Royal Australian Navy, *Haul Down Report of Vice Admiral Sir Hastings Harrington RAN as Chief of Naval Staff. Dated 6 February 1965. (SPC.DS.34.1),* Canberra: Sea Power Centre Australia. Page 3

53 Commonwealth of Australia, *Naval Board Minutes 1965: Meeting of 25 March 1965*, Vol. NAA: A2585 1965 (29-31/65) (Canberra: National Archives of Australia)

54 Commonwealth of Australia, *Internal Minute to Secretary of Prime Minister's Department by A.T. Griffith regarding Haul Down Report of Vice Admiral Sir Hastings Harrington RAN. Dated 1 April 1965.* , Vol. NAA: A1209, 1967/7451 (Canberra: National Archives of Australia), page 1

55 "HMAS Perth," *Royal Australian Navy News,* 11 June 1965, Vol9 No12, Page 12

56 Commonwealth of Australia. *CPD [Reps] Vol 43, 26 October 1965.* Page 2167

57 Commonwealth of Australia, *Acquisition of a Fourth CHARLES F. ADAMS Destroyer (DDG) [Guided Missile Destroyer] for the RAN. DECISION 366(M)*, Vol. NAA: A5841,329National Archives of Australia)

58 Commonwealth of Australia, *Naval Board Minutes 1965: Minute by 3 Naval Member. Dated 17 October 1965.*, Vol. NAA: A2585 1965 (77-80/65) (Canberra: National Archives of Australia)

59 "Hobart Commissions," *Royal Australian Navy News,* 21 January 1966, Vol9 No2, Page 1

60 Janes Information Group, *Jane's Fighting Ships 1966 - 67*, ed. Raymond Blackman London: Jane's Fighting Ships Publishing, 1968, page 363

61 Commonwealth of Australia, *Acquisition of a Fourth CHARLES F. ADAMS Destroyer (DDG) [Guided Missile Destroyer] for the RAN. DECISION 366(M)*

62 Commonwealth of Australia, *Acquisition of a Fourth CHARLES F. ADAMS Destroyer (DDG) [Guided Missile Destroyer] for the RAN. DECISION 366(M)*, Vol. NAA: A5841,329National Archives of Australia)

Date	Event	Footnote
1967	USN deployed automated IFF processing capabilities in USS *Belknap* for improved management of air picture in Vietnam theatre.	63
1967	Rotational deployments of DDGs to Vietnam commence until 1972. Single deployment of Daring class *Vendetta* being the only non-Adams ship involved in gun line operations.	64
1967	Lieutenant Robert Walls loaned from *Hobart* to NTDS fitted USS *Long Beach* for aircraft control duties in the Vietnam theatre of operations.	65
December 1967	*Brisbane* commissions in the United States.	66
February 1968	Members of DDL Project conduct study tour to evaluate digital combat system options.	67
June 1968	*Hobart* attacked by USAF aircraft while on Vietnam operations. High density of friendly aircraft in the area made management of air picture difficult using manual methods.	68
August 1968	Steering Committee meeting held for Naval Staff Target 68 (Action Data Handling System for RAN).	69
October 1968	Naval Board appoints a project team to manage Staff Target 68.	70
June 1969	RAN report developed by Captain Frank Lord regarding digital combat systems and some options for the RAN.	71
May 1970	RN Far East Fleet and RAN conduct large scale maritime exercise (Bersatu Padu) near Singapore. Trials were conducted that lead to changing seaman officer specialist training from Long Course to Principal Warfare Officer.	72
October 1970	RN completes successful trials of computerised combat system in HMS Norfolk.	73

63 Norman Friedman, *Network-Centric WARFARE: How Navies Learned to Fight Smarter through Three World Wars* Annapolis, Md.: Naval Institute Press, 2009, page 79

64 John Perryman and Brett Mitchell, *Australia's Navy in Vietnam - Royal Australian Navy Operations 1965-72* Silverwater, NSW, Australia: Topmill Pty Ltd, 2007 pages 7-36

65 Interview with Vice Admiral Robert Walls, 30 August 2011. Page 26

66 "Ship Histories," http://www.navy.gov.au/fleet/ships-boats-craft/available-ship-histories

67 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1),* 1626/204/415 Canberra: Sea Power Centre Australia. Main Report paragraphs 39-44

68 Royal Australian Navy, *Accidental Attack on HMAS Hobart by US Aircraft in Vietnam Waters (SPC.DS.20),* Navy File 68/1381 Canberra: Sea Power Centre Australia.

69 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1)*

70 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1),* 1626/204/415 Canberra: Sea Power Centre Australia.

71 Royal Australian Navy, *Naval Combat Data Systems - A State of the Art Report. Dated 30 June 1969. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 108) (SPC.DS.45.1),* 1626/204/415 Canberra: Sea Power Centre Australia.

72 Royal Australian Navy, *Warfare Officers Career Handbook*, ed. Naval Warfare Advisory Council Canberra: Royal Australian Navy, 2006, page 33

73 Norman Friedman, A. D. Baker and Alan Raven, *British Destroyers & Frigates: The Second World War and After*, 352), page 191

Date	Event	Footnote
1971	USN installs first digital Tartar missile system in USS *Joseph Strauss* (Adams class)	74
July 1971	Members of Naval Control Data Systems Project visit *Perth* in Sydney.	75
July 1971	RAN seeks government approval to modernise the DDGs with a digital combat system and digital Tartar missile system.	76
November 1971	Construction commences on new Tactical Trainer Building at *Watson* for shore-based training making use of simulators. Analogue DDG operations room is included in the design.	77
October 1971	Captain Guy Griffiths becomes first DDG Qualified seaman officer promoted to commodore (Commanding Officer of *Hobart*).	78
October 1971	*Hobart* is member of RAN task group (led by *Melbourne*) sailing for first RIMPAC Exercise off Hawaii.	79
October 1971	*Brisbane* on final RAN deployment to US 7th Fleet and Vietnam operations.	80
December 1971	Commander Brian Spark appointed as first Director of CDSC.	81
1972	RN ceases Long Course training for seaman sub-specialist officers and commences training of Principal Warfare Officers. RAN adopts the same training doctrine and sends officers to UK for training.	82
1972	Lieutenant Commander Peter Purcell posted to the United States as part of RAN digital combat system project (NCDS). RAN had chosen the USN Junior Participating Tactical Data System (JPTDS) as fitted by the USN to its own Adams class.	83
1972	White Paper: Australian Defence Review – recognised that decisions would be required for updating of the DDG combat systems.	84

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74 David L. Boslaugh, *When Computers Went to Sea*, 467), page 365

75 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1971 to December 1971,* AWM78-292-8 Canberra: Australian War Memorial. Page 100

76 Royal Australian Navy, *DDG NCDS Update - Factors and Installation Schedule. Dated 15 March 1973. (SPC.DS.17.1),* Navy File 1215/51/405 Canberra: Sea Power Centre Australia.

77 "Heavy Planting Task to Aid Trainer Scheme," *Royal Australian Navy News,* 12 November 1971, Vol14 No23, Page 1

78 Sea Power Centre Australia, *The Navy List September 1974* Canberra: Department of Defence (Navy), 1974, page 8

79 "RAN Ships Sail for Hawaiian Exercise," *Royal Australian Navy News,* 15 October 1971a, Vol14 No21, Page 6

80 "US Admirals Praise Work of RAN in Vietnam," *Royal Australian Navy News,* 15 October 1971b, Vol14 No21, Page 1

81 David Wellings Booth, Geoff Cannon and Glenn Bridgart, "Bits and Bytes," in *Memories of CDSC (Where the Navy Went to Bits)* (Canberra: Royal Australian Navy, 2009), 1-50, page 20

82 G. MacKinnell, "The SWOC - Australian Trained PWOs," *Journal of the Australian Naval Institute,* 11, 1, 1985, 45-46

83 Interview with Rear Admiral Peter Purcell, 23 April 2012. Page 28

84 Commonwealth of Australia, *Australian Defence Review* Canberra: Australian Government Publishing Service, 1972a, page 23

Date	Event	Footnote
July 1972	Government approves modernisation of RAN DDGs (NCDS). Creation of a program support centre is included (Combat Data Systems Centre).	85
August 1972	Government announces digital modernisation of DDGs (NCDS and Standard Missile) and approves construction of three light destroyers (DDL) at Williamstown Victoria.	86
January 1973	Fleet Commander Rear Admiral Dovers notes that anti-missile defence has caused RAN posture to move to a more general nature than the ASW focus it previously had. Electronic warfare is regarded a critical capability for the RAN.	87
February 1973	*Perth* commences rotational deployment of DDGs to Indian Ocean in Australian response to increased Soviet presence.	88
March 1973	Naval Project Directive 63 (NCDS) endorsed by Naval Board.	89
1973	Australian Defence Reorganisation (Tange Review).	90
August 1973	DDL Project cancelled on change of Australian Government	91
April 1974	Government approves acquisition of two Patrol Frigates (FFG) from the United States.	92
July 1974	*Perth* sails for the United States to be fitted with NCDS (JPTDS).	93
July 1975	Submarine simulator for modernised Oberon class completed at *Watson.*	94
September 1975	*Perth* returns to Australia after NCDS modernisation in USA.	95

85 Commonwealth of Australia, *Modernisation of Royal Australian Navy's DDG's - Decision 1091(AD HOC) 13 July 1972*, Vol. NAA: A5908, 703 (Canberra: National Archives of Australia)

86 Commonwealth of Australia. *CPD [Senate] Vol 34, 22 August 1972.* Page 237

87 Royal Australian Navy, *Haul Down Report of Flag Officer Commanding HMA Fleet: Rear Admiral W. Dovers RAN. Dated 22 January 1973. (SPC.DS.38.1),* Navy File 1/26/10 Canberra: Sea Power Centre Australia. Page 2

88 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1973 to December 1973,* AWM78-292-10 Canberra: Australian War Memorial. Page 16

89 Royal Australian Navy, *Project Directive no 63 - Naval Combat Data System. Dated 29 may 1973. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 104) (SPC.DS.46.1),* Navy File 1626/204/415 (N) Canberra: Sea Power Centre Australia.

90 Department of Defence (Australia), *Australian Defence: Report on the Reorganisation of the Defence Group of Departments. Presented to the Minister for Defence, November 1973 (Tange Review)* Canberra: Dept. of Defence, 1973

91 Commonwealth of Australia. *CPD [Reps] Vol 34, 22 August 1973.* Page 241

92 Commonwealth of Australia, *New Destroyer Project - Decision 2185 7 April 1974*, Vol. NAA: A5915, 1005 (Canberra: National Archives of Australia)

93 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1974 to December 1974,* AWM78-292-11 Canberra: Australian War Memorial. Pages 53-71

94 "SCTT - A Major Step Forward in the Training of Submarine Command Teams," *Royal Australian Navy News,* 1 August 1975, Vol18 No15, Page 7

95 Royal Australian Navy, *Reports of Proceedings HMAS PERTH January 1975 to December 1975,* AWM78-292-12 Canberra: Australian War Memorial. Page 75

Date	Event	Footnote
February 1976	Captain William (Bill) Rourke becomes the first DDG Qualified Engineering Officer promoted to commodore after service in a DDG (*Brisbane*).	96
April 1976	Change of Australian Government. Confirms acquisition of 2 FFG on advantageous terms to Australia and with minor modifications to the ships.	97
April 1976	*Perth* conducts workup but is overwhelmed by coordinated attacks from multiple F-111 aircraft. NCDS performance is criticised.	98
June 1976	Commodore Guy Griffiths becomes first DDG Qualified seaman officer promoted to rear admiral.	99
August 1976	Two day conference held at RAN Fleet Headquarters to discuss problems with performance of NCDS and options for improvement.	100
November 1977	Prime Minister Fraser announces acquisition of third FFG as part of election policy.	101
March 1979	Commodore William (Bill) Rourke becomes first DDG Qualified engineering officer promoted to rear admiral.	102
July 1979	Captain Ian Crawford becomes the first DDG Qualified supply officer promoted to commodore (*Perth*).	103
August 1979	Government announces improved simulation and training capability will be provided at *Watson* for DDG and FFG training.	104
February 1980	Government decides to acquire fourth FFG following Soviet invasion of Afghanistan.	105
1980 to 1985	Rotational deployments of RAN DDGs and FFGs to North West Indian Ocean assisting USN to counter increased Soviet presence.	106

96 Sea Power Centre Australia, *The Navy List December 1977* Canberra: Department of Defence (Navy), 1977 page 31

97 Commonwealth of Australia. *CPD [Reps] Vol 8, 18 February 1976.* Page 40

98 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1),* A.F. 5/3/94 Canberra: Sea Power Centre Australia. Enclosure 6 (HMAS *Perth* AAW Performance)

99 Sea Power Centre Australia, *The Navy List December 1977*, page 14

100 Royal Australian Navy, *Total Combat System Discussion Period 17 - 19 August 1976. Dated 30 September 1976. (Sea Power Centre Australia Classified Library: XC40 NHS 001 Serial 127) (SPC.DS.51.1),* A.F. 5/3/94 Canberra: Sea Power Centre Australia.

101 Commonwealth of Australia, *Prime Minister Policy Speech 21 November 1977,* Canberra: Commonwealth of Australia. Page 52

102 Sea Power Centre Australia, *The Navy List June 1979* Canberra: Department of Defence (Navy), 1979, page 33

103 Sea Power Centre Australia, *The Navy List June 1983* Canberra: Department of Defence (Navy), 1983, page 10

104 "Adelaide Commissions on Nov 15," *Royal Australian Navy News,* 17 October 1980, Vol23 No18, Page 2

105 Commonwealth of Australia. *CPD [Senate] Vol 8, 19 February 1980.* Pages 23-24

106 David Stevens, *The Australian Centenary History of Defence: The Royal Australian Navy*, page 229

Date	Event	Footnote
February 1982	Government announces intention to acquire HMS *Invincible* and that its combat system is compatible with those of the RAN. *Melbourne* is to be decommissioned as soon as possible. (The acquisition did not proceed but *Melbourne* did decommission.)	107
April 1982	Rear Admiral David Leach becomes the first DDG Qualified seaman officer promoted to vice admiral after service in a DDG (Commanding Officer *Perth*) and becomes first CNS with DDG service.	108
October 1983	Change of Australian Government. Announcement of construction of two FFGs to USN design at Williamstown, Victoria.	109
November 1984	Commodore Ian Crawford becomes the first DDG Qualified supply officer promoted to rear admiral.	110
January 1985	Principal Warfare Officer training for RAN officers commences in Australia (repatriated from the RN).	111
February 1985	Mr. Paul Dibb commences review of Australian Defence Capabilities to contribute to the 1987 White Paper. It was delivered in 1986 and highlighted the aging and capability deficiencies of the DDGs and requirement to plan in a timely manner for replacement of their capabilities. A new class of ships was proposed that ultimately became the Anzac class.	112
September 1985	*Brisbane* commences second major modernisation program.	113
March 1987	Defence White Paper of 1987. Acquisition of eight light patrol frigates announced in the second level of surface combatant capability – they became the Anzac class.	114
March 1987	*Perth* commences second major modernisation program.	115
May 1987	Acceptance Board formed to evaluate modernisation of *Brisbane*.	116

107 "It's Official: RAN to Get HMS INVINCIBLE," *Royal Australian Navy News,* 26 February 1982, Vol25 No3, Page 1

108 Sea Power Centre Australia, *The Navy List December 1982* Canberra: Department of Defence (Navy), 1982, page 27

109 Commonwealth of Australia. *CPD [Reps] Vol 33, 12 October 1983.* Page 1659

110 Sea Power Centre Australia, *The Navy List June 1985* Canberra: Department of Defence (Navy), 1985, page 10

111 G. MacKinnell, "The SWOC - Australian Trained PWOs," *Journal of the Australian Naval Institute,* 11, 1, 1985, 45-46

112 Paul Dibb, *Review of Australia's Defence Capabilities: Report to the Minister for Defence* Canberra: Australian Govt. Pub. Service, 1986

113 Royal Australian Navy, *Project 1230 - DDG Modernization (Equipment Acquisition Strategy). Dated 19 February 1988. (SPC.DS.63.1),* Navy File 91-28893 Pt 1 Canberra: Sea Power Centre Australia.

114 Commonwealth of Australia, *The Defence of Australia, 1987* Canberra: Australian Government Publishing Service, 1987, page 44

115 Royal Australian Navy, *Project 1230 - DDG Modernization (Equipment Acquisition Strategy). Dated 19 February 1988. (SPC.DS.63.1)*

116 Royal Australian Navy, *HMAS BRISBANE - Acceptance Board Report at Acceptance into Service (Report by Chairman of Acceptance Board). Dated 10 October 1988. (SPC.DS.12.1),* Navy File 18-12-55 Canberra: Sea Power Centre Australia.

Date	Event	Footnote
June 1988	Rear Admiral Peter Sinclair (Maritime Commander Australia and former Commanding Officer of *Hobart*) becomes first non-USN Flag Officer to be given command of opposing forces in the RIMPAC exercise series.	117
September 1988	*Hobart* commences second major modernisation program.	118
August 1988	Work completes on FFG simulators at *Watson*. Further work was needed to upgrade the DDG simulators to the same configuration as in the actual DDGs.	119
1989	Australia's Strategic Planning in the 1990s. Recognised that conflict could emerge from short warning and that long warning periods might not be possible.	120
November 1989	*Perth* completes second modernisation.	121
December 1990	First Gulf War. *Brisbane* is the senior ship for the second RAN deployment. Requires further weapon, sensor and communications upgrades to meet the threat.	122
1991	Force Structure Review 1991. Block obsolescence of some capabilities in early 21st century recognised. Derivative of Anzac frigate recommended as replacement for the DDGs. Major modernisations of warships should no longer be undertaken due their cost and generally low benefit. Lack of timely replacement for DDGs is evident.	123
January 1991	DDG training simulator at *Watson* to be further modified and completed by early 1994.	124
May 1991	Feasibility study undertaken by RAN to fit Adams class with flight deck to support limited helicopter operations. Does not proceed further.	125
August 1991	*Hobart* completes second modernisation.	126

117 "RIMPAC Command to RAN," *Royal Australian Navy News,* 24 June 1988, Vol31 No12, Page 1

118 Royal Australian Navy, *Project 1230 - DDG Modernization (Equipment Acquisition Strategy). Dated 19 February 1988. (SPC.DS.63.1)*

119 "Model Upgrade for FFGs," *Royal Australian Navy News,* 5 August 1988, Vol31 No15, Page 2

120 Commonwealth of Australia, *Australia's Strategic Planning in the 1990s* Canberra: Departmental Publications 113/92, September 1992 page 39

121 "PERTH Powers On," *Royal Australian Navy News,* 24 November 1989, Vol32 No22, Page 9

122 Royal Australian Navy, *HMAS BRISBANE Reports of Proceedings, January to December 1991 (SPC.DS.59.1),* Canberra: Sea Power Centre Australia. Page 8

123 Department of Defence (Australia), *Force Structure Review* Canberra: Australian Government Publishing Services, May 1991, Covering letter, pages 15-16

124 "Training Facility Upgrade," *Royal Australian Navy News,* 18 January 1991, Vol34 No1, Page 2

125 Royal Australian Navy, *RAN DDG Modernisation Project - Re-Engining of DDGs and Other Enhancements: Naval Engineering Services Branch: DDG Helicopter Feasibility Study 23 may 1991 - Navy File 89-23269 Pt 1(SPC.DS.61.1),* Canberra: Sea Power Centre Australia.

126 "Hobart, Orion Refits Over," *Royal Australian Navy News,* 30 August 1991, Vol34 No17, Page 3

Date	Event	Footnote
1993	Strategic Review 1993. Block obsolescence of capabilities was likely (DDGs included) and that more capable threats were appearing in Australia's region.	127
April 1993	USS *Goldsborough* decommissions – marking end of service by Adams class with USN.	128
May 1993	Government announces acquisition of ex-USS *Goldsborough* to provide DDG spares and training equipment.	129
1994	White Paper: Defending Australia - Defence White Paper 1994. The recommended policy of 1991 of not conducting major modernisations is overturned and a major upgrade program initiated for the FFGs. Studies would address the capability question of the DDG but recognition was made of them leaving service without replacement.	130
1997	Defence Efficiency Review. Major review of Defence functions and capabilities with the intention of identifying administrative efficiencies for redeployment of resources into an improved force structure. A precursor to the subsequent policy paper.	131
1997	Australia's Strategic Policy. Air power promoted as the primary means of defending Australia with priority given for future fighters. Warships were not central to the capabilities being developed and no further surface combatants would be acquired. Provision of land based air defence to the RAN was the preferred method by Government of defending against air attack but recognised that a lack of availability could not be discounted.	132
1999	Minister for Defence rejects idea of acquiring second hand USN warships (*Kidd* class) to replace DDGs.	133
October 1999	*Perth* decommissions and taken out of service.	134
December 1999	Anzac War Fighting Improvement Project is cancelled. This project was intended to provide advanced capabilities to the Anzac Frigates to replace the DDGs. Cost and technical risk challenges were regarded too high to continue. An air defence capability gap is introduced for the RAN.	135

127 Commonwealth of Australia, *Strategic Review 1993* Canberra: Australian Government Publishing Service, December 1993, pages 43 & 47

128 "USS Goldsborough (DDG-20)," NavSource Naval History, http://www.navsource.org/archives/05/01020.htm

129 "Surplus USN DDG for RAN," *Royal Australian Navy News,* 7 May 1993, Vol36 No8, Page 3

130 Commonwealth of Australia, *Defending Australia (Defence White Paper 1994)* Canberra: Australian Government Publishing Service, November 1994, page 43

131 Department of Defence (Australia), *Future Directions for the Management of Australia's Defence - Report of the Defence Efficiency Review* Canberra, A.C.T: Directorate of Publishing and Visual Communications, 1997

132 Commonwealth of Australia, *Australia's Strategic Policy* Canberra: Defence Publishing and Visual Communications, 1997

133 "Navy Told US Ships Too Risky," *Herald-Sun,* 5 November 1999,

134 Sea Power Centre Australia, *Ship Histories*

135 Janes Navy International, "ANZAC WIP Scrapped," *Janes Navy International,* 1 December 1999, 1

Date	Event	Footnote
1999-2000	Australia participates in East Timor UN military operation to transfer sovereignty and independence from Indonesia. Australia is lead nation and US provides support. Primary air defence capability present in USN Aegis Cruiser.	136
2000	White Paper: Defence 2000 - Our Future Defence Force. Noted the changes in Australia's strategic circumstances and that ship-borne air defence capabilities were required. A new class of destroyer was required to replace the capabilities of the DDG but the FFGs would have that role in the interim. The Air Warfare Destroyer program was initiated (Hobart class).	137
2000	RAN produces the first edition of its own Maritime Doctrine.	138
May 2000	*Hobart* decommissions and taken out of service.	139
September 2001	Agreement for submarine combat system cooperation signed between RAN Chief of Navy Vice Admiral David Shackleton and USN Chief of Naval Operations Admiral Vernon Clarke.	140
October 2001	*Brisbane* decommissions and taken out of service.	141
2004	Agreement for surface warfare cooperation signed between RAN Chief of Navy Vice Admiral Christopher Ritchie and USN Chief of Naval Operations Admiral Vernon Clarke.	142
December 2005	Australian Government announces acquisition of Aegis combat system to equip the Hobart class of destroyers for the RAN.	143
July 2006	CDSC closes and its functions are replaced by the Naval Warfare Systems Agency.	144
2009	White Paper: Defending Australia in the Asia Pacific Century: Force 2030. Confirms acquisition of Hobart class and intent to fit most modern USN surface to air missile system.	145

136 David Stevens, *Strength through Diversity: The Combined Role in Operation Stabilise* Canberra: Sea Power Centre Australia, 2007 page 21

137 Commonwealth of Australia, *Defence 2000: Our Future Defence Force* Canberra: Defence Publishing Service, 2000, page 90

138 Royal Australian Navy, *Australian Maritime Doctrine (RAN Doctrine 1) 2000*, 1st ed. Canberra, ACT: Defence Publishing Service, 2000

139 Sea Power Centre Australia, *Ship Histories*

140 "CN Visit Cements Old and New Ties," *Royal Australian Navy News,* 1 October 2001, Vol44 No19, Page 6

141 Sea Power Centre Australia, *Ship Histories*

142 Royal Australian Navy, *Haul Down Report of Chief of Navy: Vice Admiral C.A. Ritchie RAN. Dated 3 July 2000. (SPC.DS.41.1),* Canberra: Sea Power Centre Australia.

143 Department of Defence (Australia), *Purchase of Aegis Combat System for Destroyers (MIN 196/05)* (Canberra: Commonwealth of Australia)

144 "FFG Upgrade is on Course at GID Site," *Royal Australian Navy News,* 30 October 2000, Vol43 No21, Page 10

145 Commonwealth of Australia, *Defending Australia in the Asia Pacific Century : Force 2030 (Defence White Paper 2009)* Canberra: Canberra : Australian Govt. Pub. Service, 2009 page 71

Date	Event	Footnote
2009	Defence Strategic Reform Program. A further comprehensive review of review of Defence functions seeking efficiencies to fund the force structure of the future.	146
2009	FFG Modernisation completes. Originally intended to be undertaken by six ships, the number was reduced to four to control costs. The project was four years late in delivery and over cost. SM-2 was fitted to replace SM-1 but was not part of the original capability upgrade.	147
2011	Rizzo Review investigated causes of RAN ships being taken out of service early and found it was a result of deficient RAN engineering practices. Recommends closer relationships between RAN and industry.	148

146 Department of Defence (Australia), *The Strategic Reform Program MAKING IT HAPPEN* Canberra: Defence Publishing services, 2010

147 Lee Cordner, "The most Capable Warships in the Navy's History Set to Join the Fleet," *Headmark (Journal of the Australian Naval Institute),* 130, 2008, 4-14

148 P. Rizzo, *Plan to Reform Support Ship Repair and Management Practices* Canberra: Department of Defence, 2011

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Appendix E Tables and Graphs for Senior Officer Promotion

Summary

The following tables and graphs support the examination of RAN senior leadership development as presented in Chapter 6, which incorporates an assessment of the relevance of the data. Details were drawn from the RAN *Navy List* series with minor assistance obtained from personal communications. Supporting Tables are shown in Appendixes F and G.

Seaman Branch Promotions to Commodore

Figure E-1 Seaman Branch Promotions to Commodore 1971 – 2001

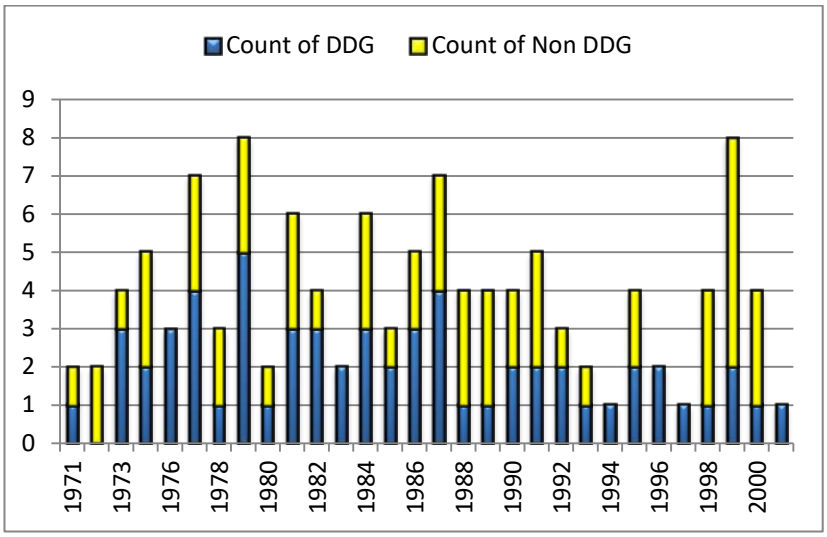


Table E-1 Seaman Branch Promotions to Commodore 1971 to 2001 – by Sub-Specialisation

Sub-Specialisation	DDG	Non DDG	Total
Navigation	13	5	18
Torpedo & Anti-Submarine	9	5	14
Gunnery	7	4	11
Communications	5	2	7
Direction	5	4	9
PWO Navigation	4	1	5
PWO Anti-Submarine Warfare	3	3	6
PWO Communications	3		3
PWO Direction	3	2	5
PWO Gunnery	3	1	4
Submariner	2	5	7
Seaman	2	3	5
Pilot	1	12	13
Mine Clearance Diver		2	2
Hydrography		3	3
Observer		2	2
TAS & MCD		1	1
Principal Warfare Officer		1	1
Grand Total	**60**	**56**	**116**

Table E-2 DDG Numbers of Commanding Officers (Operational)

Posting/Rank	CAPT	CMDR	LCDR	Total
Brisbane	16	4	2	22
Hobart	16	4	1	21
Perth	18	5	2	25
Grand Total	**50**	**13**	**4**	**68**

Table E-3 DDG Commanding Officers – by Sub-Specialisation

Sub-Specialisation	*Brisbane*	*Hobart*	*Perth*	Total
Seaman		1	2	3
Navigator	4	2	5	11
Torpedo & Anti-Submarine	2	4	1	7
Gunnery	1	2	3	6
Communications	2	3	2	7
Direction	3	1	2	6
Submariner +		1		1
Pilot		1		1
PWO			1	1
PWO (Navigation)	3	1	2	6
PWO (Gunnery)	3	2	2	7
PWO (Anti-Submarine Warfare)	1	2	2	5
PWO (Direction)	2	1		3
PWO (Communications)			3	3
Grand Total	**21**	**21**	**25**	**67**

Figure E-2 Promotions to Commodore: Navigating Officers 1973 - 2001

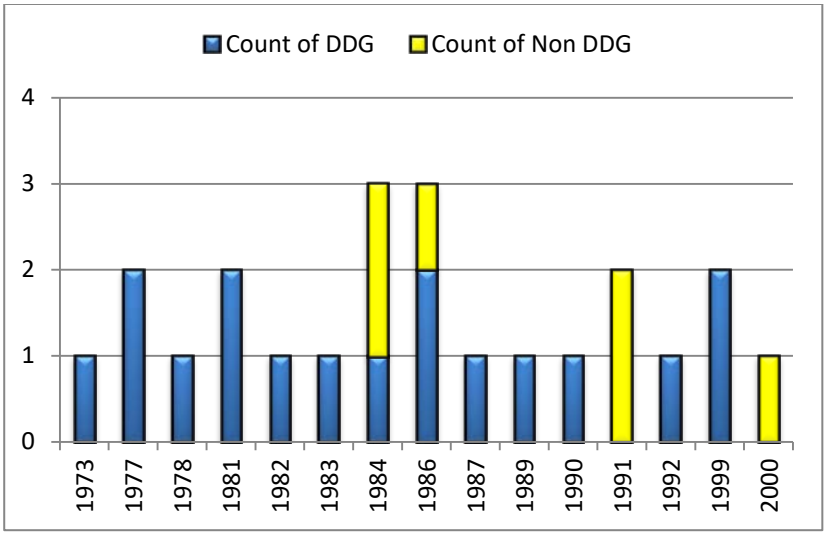


Table E-4 PWO Promotions to Commodore 1990 to 2001

Sub Specialisation	DDG	Non DDG
PWO Navigation	4	1
PWO Gunnery	3	1
PWO Anti-Submarine Warfare	3	3
PWO Direction	3	2
PWO Communications	3	
Principal Warfare Officer		1
Grand Total	**16**	**8**

Seaman Branch Promotions to Rear Admiral

Figure E-3 Seaman Branch Promotion to Rear Admiral 1976 – 2001

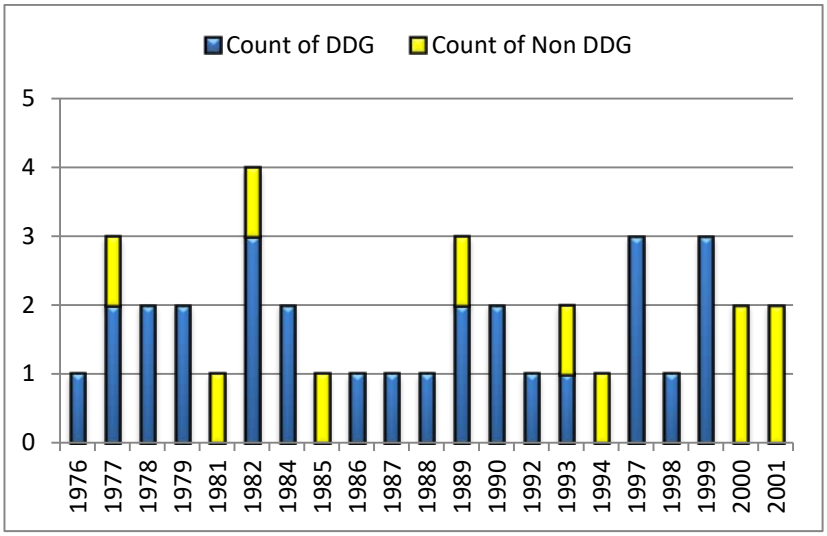


Table E-5 Seaman Branch Promotions to Rear Admiral 1976 – 2001 by Sub-Specialisation

Sub Specialisation	DDG	Non DDG	Total
Navigation	7	2	9
Gunnery	4	2	6
Torpedo & Anti-Submarine	4	1	5
Direction	3		3
PWO Anti-Submarine Warfare	2	1	3
PWO Gunnery	2		2
PWO Navigation	2		2
Communications	1		1
PWO Communications	1		1
PWO Direction	1	1	2
Submariner	1	2	3
Pilot		1	1
Seaman		1	1
Grand Total	**28**	**11**	**39**

Seaman Branch Promotions to Vice Admiral

Figure E-4 Seaman Branch Promotions to Vice Admiral 1982 – 2001

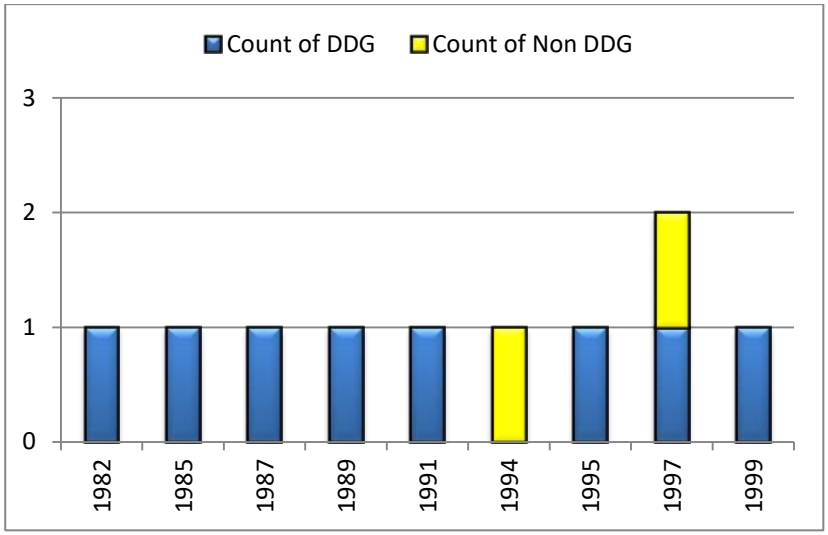


Table E-6 Seaman Branch Promotions to Vice Admiral 1982 – 2001 by Sub-Specialisation

Sub Specialisation	DDG	Non DDG	Total
Torpedo & Anti-Submarine	2		2
Navigation	2	2	4
Gunnery	1		1
Direction	1		1
PWO Direction	1		1
Submariner	1		1
Seaman Total	**8**	**2**	**10**

Engineering Branch Promotions to Commodore

Figure E-5 Engineering Branch: Promotions to Commodore 1976 – 2001

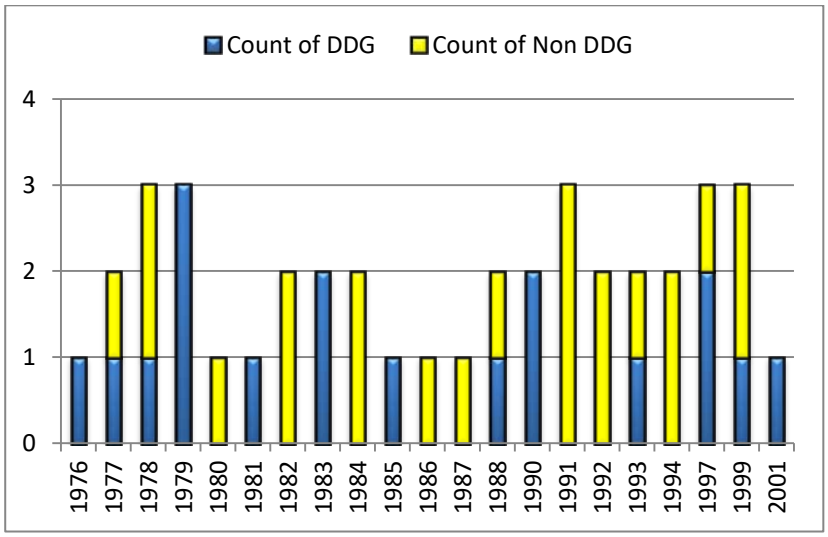


Table E-7 Engineering Branch Promotions to Commodore 1976 - 2001 by Sub-Branch

Engineering Sub-Branch	DDG	Non DDG	Total
Weapons Electrical Engineer	12	4	16
Weapons Electrical Engineer - Submarines	1	3	4
Marine Engineering	4	9	13
Marine Engineer - Submarine	1	3	4
Air Engineering		3	3
Grand Total	**18**	**22**	**40**

Engineering Branch Promotions to Rear Admiral

Figure E-6 Engineering Branch: Promotions to Rear Admiral 1979 – 2001

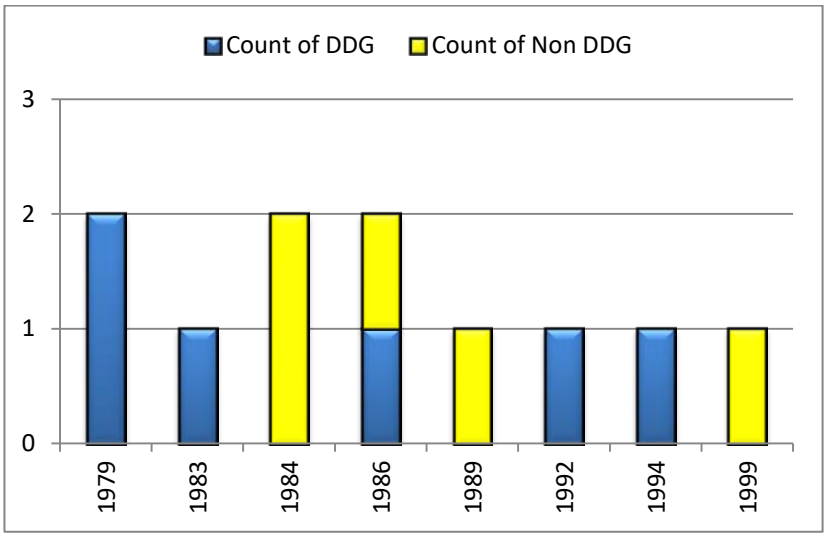


Table E-8 Engineering Branch: Promotions to Rear Admiral 1979 – 2001 by Sub-Branch

Engineering Sub Branch	DDG	Non DDG	Total
Weapons Electrical Engineer	4	1	5
Marine Engineering	2	2	4
Air Engineering		2	2
Grand Total	**6**	**5**	**11**

Supply Branch Promotions to Commodore

Figure E-7 Supply Branch Promotions to Commodore 1979 to 2001

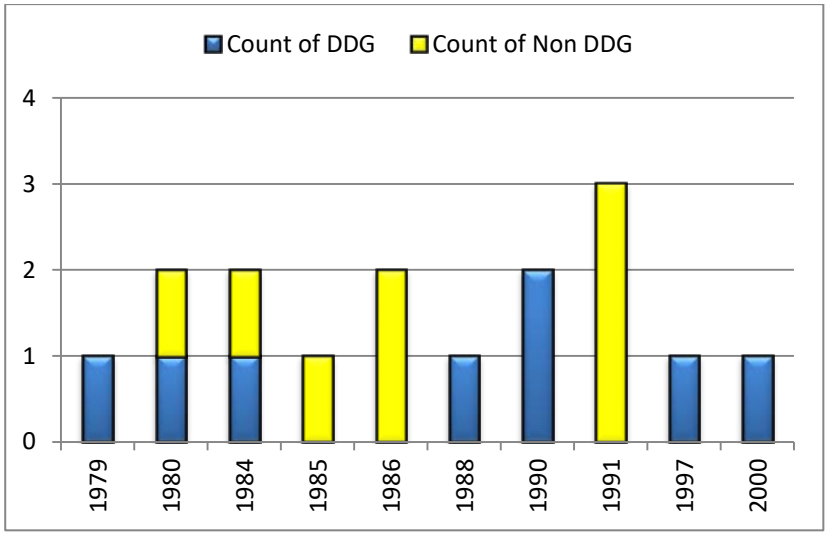


Table E-9 Supply Branch Promotions to Commodore 1979 to 2001

Branch	DDG	Non DDG	Total
Supply	8	8	16
Supply Total	**8**	**8**	**16**

Supply Branch Promotions to Rear Admiral

Figure E-8 Supply Branch Promotions to Rear Admiral 1984 to 2001

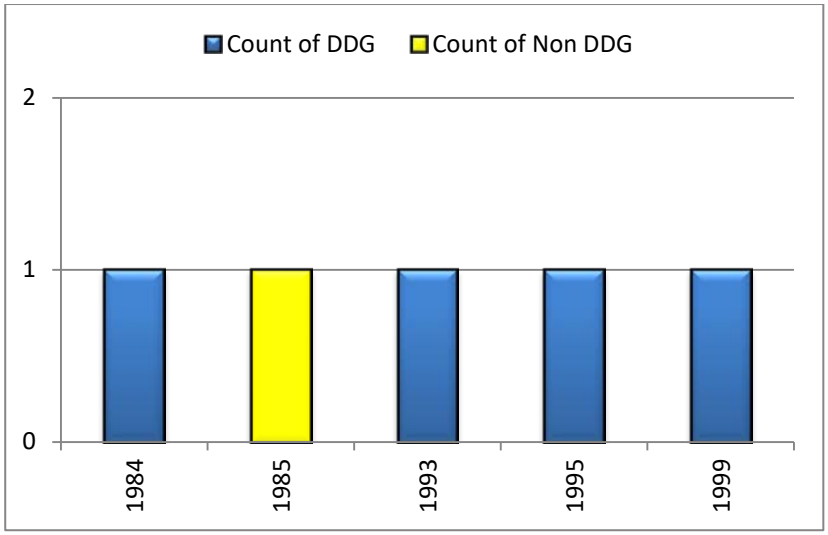


Table E-10 Supply Branch Promotions to Rear Admiral 1984 to 2001

Branch	DDG	Non DDG	Total
Supply	4	1	5
Supply Total	**4**	**1**	**5**

DDG Command and Star Rank Achieved

Table E-11 DDG Commanding Officers and Star Rank Achieved at Retirement

Ship/Rank	Admiral	Vice Admiral	Rear Admiral	Commodore	Total
Brisbane	1	4	6	9	20
Perth		3	3	12	18
Hobart		2	7	8	17
Grand Total	**1**	**9**	**16**	**29**	**55**

Leaders of the RAN

Table E-12 Leaders of the RAN 1955 to 2008

		DDG			Aircraft Carrier			Cruiser	Destroyer Escort
Year	CNS/CN	*Brisbane*	*Hobart*	*Perth*	*Melbourne*	*Sydney*	*Vengeance*	*Australia*	*Torrens*
1955	Dowling					1			
1959	Burrell						1		
1962	Harrington					1			
1965	McNicoll							1	
1968	Smith				1				
1970	Peek				1				
1973	Stevenson				1				
1976	Synnot				1				
1979	Willis				1				
1982	Leach			1					
1985	Hudson	1			1				
1991	MacDougall		1						
1994	Taylor								1
1997	Chalmers			1					
1999	Shackleton	1							
2002	Ritchie	1							
2005	Shalders			1					
Total	**18**	**3**	**1**	**3**	**6**	**2**	**1**	**1**	**1**

Summary of Star Rank Promotions by Branch

Table E-13 Summary of RAN Star Rank Promotions by Branch 1971 – 2001

	Rank	Commodore		Rear Admiral		Vice Admiral	
Branch	**Period**	**DDG%**	**Non DDG%**	**DDG%**	**Non DDG%**	**DDG%**	**Non DDG%**
Seaman	1971 - 2001	51.7	48.2				
	1976 - 2001			71.8	28.2		
	1982 - 2001					80.0	20.0
Engineering	1976 - 2001	45	55				
	1979 - 2001			54.5	45.5		
Supply	1979 - 2001	50	50				
	1984 - 2001			80.0	20.0		

Promotion to Rear Admiral (all Branches)

Table E-14 Promotions to Rear Admiral 1976 to 2001

Period (Inclusive)	DDG	Non DDG	Total
1976-1981	9	3	12
1982-1986	9	7	16
1987-1992	8	2	10
1993-1998	8	2	10
Sub Total	*34*	*14*	*48*
1999-2001	4	5	9
Total	**38**	**19**	**57**

Appendix F Officers of the RAN Promoted to Star Rank 1971 to 2001

Tables and Terminology

The following tables provide summary details of officers promoted to star ranks in the period. The Navy List (Year and Month) which records their details of rank and seniority in the *Navy List* series is shown in the two left most columns. The 'Seniority' column shows the year in which their seniority in rank commenced. Those with the figure 1 in the DDG column satisfy the requirements for being DDG Qualified. The term 'non-DDG' in the right-most column is used to refer to those who did not hold those positions.

Table F-1 Seaman Officers Promoted to Commodore 1971 to 2001

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1974	Sep	1971	Griffiths	Guy	Gunnery	1	
1974	Sep	1971	Robertson	Andrew	Gunnery		1
1974	Sep	1972	Loxton	Bruce	Direction		1
1974	Sep	1972	Merson	James	Direction		1
1974	Sep	1973	Clarke	Domara	Direction		1
1974	Sep	1973	Doyle	Peter	Navigation	1	
1974	Sep	1973	Shands	Ken	Direction	1	
1974	Sep	1973	Willis	Alan	Direction	1	
1975	Mar	1975	Goble	John	Pilot		1
1975	Mar	1975	Gray	Ken	Pilot		1
1975	Mar	1975	Leach	David	Gunnery	1	
1977	Dec	1975	Parker	Vernon	Torpedo & Anti-Submarine		1
1977	Dec	1975	Swan	Rothsay	Communications	1	
1977	Dec	1976	Hutson	Peter	Gunnery	1	
1977	Dec	1976	Percy	Robert	Torpedo & Anti-Submarine	1	
1977	Dec	1976	Stevens	John. D	Torpedo & Anti-Submarine	1	
1977	Dec	1977	Boase	Neil	Torpedo & Anti-Submarine		1
1977	Dec	1977	Burnside	Ian	Navigation	1	
1977	Dec	1977	Cleary	Brian	Torpedo & Anti-Submarine		1
1977	Dec	1977	Loosli	Robert	Direction	1	
1977	Dec	1977	Robertson	John	Communications	1	
1977	Dec	1977	Woolrych	Geoffrey	Torpedo & Anti-Submarine		1
1977	Dec	1978	Hudson	Michael	Navigation	1	
1977	Dec	1978	Lee	Norman	Pilot		1
1977	Dec	1978	O'Farrell	James	Pilot		1
1979	Jun	1979	Clarke	Malcolm	Observer		1

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1979	Jun	1979	Martin	David	Gunnery		1
1979	Jun	1979	Nicholson	Ian	Communications	1	
1981	Jun	1980	Kennedy	Philip	Torpedo & Anti-Submarine	1	
1981	Jun	1981	Orr	David	Pilot		1
1981	Dec	1981	Snow	John	Communications		1
1980	Jan	1977	Richards	Ian	Navigation	1	
1980	Jan	1979	Burnett	Rory	Torpedo & Anti-Submarine	1	
1980	Jan	1979	Johnston	Eric	Seaman	1	
1980	Jan	1979	Knox	Ian	Torpedo & Anti-Submarine	1	
1980	Jan	1979	Matthew	John	Pilot		1
1980	Jan	1979	Sinclair	Peter	Gunnery	1	
1982	Dec	1980	Ralph	Neil	Pilot		1
1982	Dec	1981	Baird	Malcolm	Communications	1	
1982	Dec	1981	Dadswell	Thomas	Pilot		1
1982	Dec	1981	Horton	Anthony	Navigation	1	
1982	Dec	1981	James	Ian	Navigation	1	
1982	Dec	1982	Adams	Harold	Communications	1	
1982	Dec	1982	Cummins	Adrian	Gunnery	1	
1983	Dec	1982	Dickson	James	Navigation	1	
1983	Dec	1982	James	Peter	Torpedo & Anti-Submarine		1
1984	Jun	1983	Beaumont	Alan	Torpedo & Anti-Submarine	1	
1984	Jun	1983	Rayment	Michael	Navigation	1	
1984	Jun	1984	Jackson	Malcolm	Navigation		1
1984	Jun	1984	Thomson	David	Navigation	1	
1985	Jun	1984	Stoker	Nigel	Torpedo & Anti-Submarine	1	
1985	Jun	1984	Taylor	Malcolm	Navigation		1
1985	Jun	1984	Unwin	Malcolm	Direction		1
1986	Jun	1984	Berger	Howard	Direction	1	
1986	Jun	1985	Carwardine	Anthony	Gunnery	1	
1986	Jun	1985	MacDougall	Ian	Submariner	1	
1986	Jun	1985	McKay	Peter	Seaman		1
1987	Jun	1986	Bateman	Walter	Seaman	1	
1987	Jun	1986	Doolan	Kenneth	Navigation	1	
1987	Jun	1986	Sulman	Leonard	Navigation	1	
1987	Jun	1986	Taylor	Rodney	Navigation		1
1988	Jun	1986	Callaway	Ian	Gunnery		1
1988	Jun	1987	Chalmers	Donald	Navigation	1	
1988	Jun	1987	Compton	John	Hydrography		1

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1988	Jun	1987	Donohue	Hector	TAS & MCD		1
1988	Jun	1987	Longden	James	Torpedo & Anti-Submarine	1	
1988	Jun	1987	Roach	Terence	Submariner	1	
1988	Jun	1987	Salmon	Martin	Seaman		1
1988	Jun	1988	Da Costa	John	Pilot		1
1989	Jun	1987	Farthing	David	Pilot	1	
1989	Jun	1988	Heron	George	Pilot		1
1989	Jun	1988	Walls	Robert	Direction	1	
1989	Jun	1988	Wilson	Bryan	Gunnery		1
1989	Jun	1989	Brecht	Alan	Communications		1
1989	Jun	1989	Stubington	Edward	Navigation	1	
1990	Jun	1989	Briggs	Peter	Submariner		1
1990	Jun	1989	Littleton	Clement	Mine Clearance Diver		1
1990	Jun	1990	Partington	Robin	Pilot		1
1992	Jul	1990	Leech	John	Hydrography		1
1992	Jul	1990	Morton	Geoffrey	Gunnery	1	
1992	Jul	1990	Oxenbould	Christopher	PWO Navigation	1	
1992	Jul	1991	Barrie	Christopher	Navigation		1
1992	Jul	1991	Cox	Timothy	PWO Anti-Submarine Warfare	1	
1992	Jul	1991	Dunne	Michael	Submariner		1
1992	Jul	1991	Kable	Garvon	Navigation		1
1992	Jul	1991	Sloper	Graham	Torpedo & Anti-Submarine	1	
1992	Jul	1992	Christie	Rupert	PWO Anti-Submarine Warfare		1
1993	Jul	1992	Ritchie	Christopher	PWO Anti-Submarine Warfare	1	
1993	Jul	1993	Pitt	Kim	Submariner		1
1994	Oct	1992	Lord	John	PWO Navigation	1	
1994	Oct	1993	Shackleton	David	PWO Direction	1	
1994	Oct	1994	Harrington	Simon	PWO Communications	1	
1995	Jul	1995	O'Hara	James	Principal Warfare Officer		1
1996	Jul	1995	Dovers	William	PWO Gunnery	1	
1996	Jul	1995	Willis	Robert	Hydrography		1
1997	Aug	1996	Smith	Geoffrey	PWO Gunnery	1	
1997	Aug	1996	Walpole	Geoffrey	PWO Communications	1	

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1998	Aug	1995	Shalders	Russell	PWO Anti-Submarine Warfare	1	
1998	Aug	1997	Robertson	Brian	PWO Communications	1	
1998	Aug	1998	Adams	Brian	Seaman		1
1998	Aug	1998	McCaffrie	John	Observer		1
1998	Aug	1998	Stapleton	James	PWO Gunnery	1	
1999	Aug	1998	Eames	Keith	Pilot		1
1999	Aug	1999	Bonser	Marcus	PWO Anti-Submarine Warfare		1
1999	Aug	1999	Gates	Raydon	PWO Direction		1
2000	Aug	1999	Clarke	Peter	Submariner		1
2000	Aug	1999	Cordner	Lee	PWO Gunnery		1
2000	Aug	1999	Moffitt	Rowan	PWO Navigation	1	
2000	Aug	1999	Mole	Denis	Submariner		1
2000	Aug	1999	Pataky	Les	PWO Direction		1
2000	Aug	1999	Rago	Louis	PWO Navigation	1	
2000	Aug	2000	Crane	Russell	Mine Clearance Diver		1
2000	Aug	2000	Flint	Anthony	PWO Direction	1	
2000	Aug	2000	Gately	Warwick	PWO Navigation		1
2001	Aug	2000	Hancock	Maxwell	PWO Anti-Submarine Warfare		1
2003	Feb	2001	Tripovich	Matthew	PWO Direction	1	
Grand Total					**116**	**60**	**56**

Table F-2 Seaman Officers Promoted to Rear Admiral 1976 - 2001

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1977	Dec	1976	Griffiths	Guy	Gunnery	1	
1977	Dec	1977	Doyle	Peter	Navigation	1	
1977	Dec	1977	Robertson	Andrew	Gunnery		1
1977	Dec	1977	Willis	Alan	Direction	1	
1979	Jan	1978	Leach	David	Gunnery	1	
1979	Jan	1978	Swan	Rothsay	Communications	1	
1979	Jan	1979	Stevens	John. D	Torpedo & Anti-Submarine	1	
1979	Jun	1979	Loosli	Robert	Direction	1	
1981	Jun	1981	Woolrych	Geoffrey	Torpedo & Anti-Submarine		1

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1982	Dec	1982	Hudson	Michael	Navigation	1	
1982	Dec	1982	Knox	Ian	Torpedo & Anti-Submarine	1	
1982	Dec	1982	Martin	David	Gunnery		1
1982	Dec	1982	Richards	Ian	Navigation	1	
1984	Jun	1984	Kennedy	Philip	Torpedo & Anti-Submarine	1	
1984	Jun	1984	Sinclair	Peter	Gunnery	1	
1985	Jun	1985	Ralph	Neil	Pilot		1
1986	Jun	1986	Horton	Anthony	Navigation	1	
1987	Jun	1987	Beaumont	Alan	Torpedo & Anti-Submarine	1	
1988	Jun	1988	Carwardine	Anthony	Gunnery	1	
1989	Jun	1989	Doolan	Kenneth	Navigation	1	
1989	Jun	1989	MacDougall	Ian	Submariner	1	
1990	Jun	1989	Taylor	Rodney	Navigation		1
1992	Jul	1990	Stubington	Edward	Navigation	1	
1992	Jul	1990	Walls	Robert	Direction	1	
1992	Jul	1992	Chalmers	Donald	Navigation	1	
1994	Oct	1993	Briggs	Peter	Submariner		1
1994	Oct	1993	Oxenbould	Christopher	PWO Navigation	1	
1995	Jul	1994	Barrie	Christopher	Navigation		1
1997	Aug	1997	Harrington	Simon	PWO Communications	1	
1997	Aug	1997	Lord	John	PWO Navigation	1	
1997	Aug	1997	Ritchie	Christopher	PWO Anti-Submarine Warfare	1	
1998	Aug	1998	Shackleton	David	PWO Direction	1	
1999	Aug	1999	Dovers	William	PWO Gunnery	1	
1999	Aug	1999	Shalders	Russell	PWO Anti-Submarine Warfare	1	
1999	Aug	1999	Smith	Geoffrey	PWO Gunnery	1	
2000	Aug	2000	Adams	Brian	Seaman		1
2003	Feb	2000	Gates	Raydon	PWO Direction		1
2003	Feb	2001	Bonser	Marcus	PWO Anti-Submarine Warfare		1
2003	Feb	2001	Clarke	Peter	Submariner		1
Grand Total					**39**	**28**	**11**

Table F-3 Seaman Officers Promoted to Vice Admiral 1982 - 2001

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1982	Dec	1982	Leach	David	Gunnery	1	
1985	Jun	1985	Hudson	Michael	Navigation	1	
1987	Jun	1987	Knox	Ian	Torpedo & Anti-Submarine	1	
1990	Jun	1989	Beaumont[1]	Alan	Torpedo & Anti-Submarine	1	
1992	Jul	1991	MacDougall	Ian	Submariner	1	
1994	Oct	1994	Taylor	Rodney	Navigation		1
1995	Jul	1995	Walls	Robert	Direction	1	
1997	Aug	1997	Barrie	Christopher	Navigation		1
1997	Aug	1997	Chalmers	Donald	Navigation	1	
1999	Aug	1999	Shackleton	David	PWO Direction	1	
Grand Total					**10**	**8**	**2**

Table F-4 Engineer Officers Promoted to Commodore 1976 - 2001

Navy List		**Seniority**	**Surname**	**First**	**Sub Specialisation**	**DDG**	**Non DDG**
1977	Dec	1976	Rourke	William	Marine Engineering	1	
1977	Dec	1977	Fisher	Thomas	Marine Engineering		1
1977	Dec	1977	Jones	Ivor	Weapons Electrical Engineer	1	
1977	Dec	1978	Crossley	William	Weapons Electrical Engineer		1
1979	Jun	1978	Dalrymple	Henry	Marine Engineering		1
1979	Jun	1978	Lynam	Daryall	Weapons Electrical Engineer	1	
1981	Jan	1980	Berlyn	Nigel	Marine Engineering		1
1981	Dec	1981	Holthouse	David	Marine Engineering	1	
1980	Jan	1979	Calder	Ron	Weapons Electrical Engineer	1	

[1] Beaumont was the only DDG Qualified officer promoted Admiral. He was promoted on 17 April 1993 and appointed as Chief of the Defence Force. See *Navy List* July 1993.

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1980	Jan	1979	Miller	Desmond	Weapons Electrical Engineer	1	
1980	Jan	1979	Partington	Jeffrey	Marine Engineering	1	
1982	Dec	1982	Jobson	John	Weapons Electrical Engineer		1
1983	Dec	1982	Hughes	Owen	Air Engineering		1
1983	Dec	1983	Cooper	Ormsby	Weapons Electrical Engineer	1	
1985	Jun	1983	Holmes	Ian	Weapons Electrical Engineer	1	
1985	Jun	1984	Fox	Daryl	Weapons Electrical Engineer		1
1985	Jun	1984	Hunt	Anthony	Air Engineering		1
1986	Jun	1985	Dechaineux	Peter	Marine Engineer - Submarine	1	
1987	Jun	1986	York	David	Marine Engineering		1
1989	Jun	1987	Mitchell	Peter	Weapons Electrical Engineer - Submarines		1
1989	Jun	1988	Ferry	David	Air Engineering		1
1990	Jun	1988	Hammond	Nicholas	Weapons Electrical Engineer	1	
1992	Jul	1990	Purcell	Peter	Weapons Electrical Engineer	1	
1992	Jul	1990	Walkington	Deane	Weapons Electrical Engineer	1	
1992	Jul	1991	Polding	George	Marine Engineering		1
1992	Jul	1991	Trotter	Robert	Marine Engineer - Submarine		1
1993	Jul	1991	Rose	Geoffrey	Marine Engineer - Submarine		1
1993	Jul	1992	Lamacraft	Richard	Marine Engineering		1
1994	Oct	1992	Helyer	Nicholas	Marine Engineering		1

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1994	Oct	1993	Elsmore	Christopher	Marine Engineer - Submarine		1
1994	Oct	1993	McGuire	Philip	Weapons Electrical Engineer	1	
1994	Oct	1994	Asker	Eoin	Weapons Electrical Engineer - Submarines		1
1994	Oct	1994	Mitchell	Patrick	Marine Engineering		1
1997	Aug	1997	Warrington	Michael	Marine Engineering		1
1998	Aug	1997	Hatcher	Peter	Weapons Electrical Engineer - Submarines	1	
1998	Aug	1997	Ruting	Trevor	Marine Engineering	1	
1999	Aug	1999	Davis	Mervyn	Weapons Electrical Engineer		1
2000	Aug	1999	Greenfield	Paul	Weapons Electrical Engineer – Submarines		1
2000	Aug	1999	Joseph	Kenneth	Weapons Electrical Engineer	1	
2003	Feb	2001	Malpress	Keith	Weapons Electrical Engineer	1	
Grand Total					40	18	22

Table F-5 Engineer Officers Promoted to Rear Admiral 1979 to 2001

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1979	Jan	1979	Rourke	William	Marine Engineering	1	
1980	Jan	1979	Lynam	Daryall	Weapons Electrical Engineer	1	
1983	Jun	1983	Calder	Ron	Weapons Electrical Engineer	1	

Navy List		Seniority	Surname	First	Sub Specialisation	DDG	Non DDG
1984	Jun	1984	Crossley	William	Weapons Electrical Engineer		1
1985	Jun	1984	Berlyn	Nigel	Marine Engineering		1
1987	Jun	1986	Holthouse	David	Marine Engineering	1	
1987	Jun	1986	Hughes	Owen	Air Engineering		1
1990	Jun	1989	Hunt	Anthony	Air Engineering		1
1993	Jul	1992	Hammond	Nicholas	Weapons Electrical Engineer	1	
1995	Jul	1994	Purcell	Peter	Weapons Electrical Engineer	1	
1999	Aug	1999	Lamacraft	Richard	Marine Engineering		1
Grand Total					**11**	**6**	**5**

Table F-6 Supply Officers Promoted to Commodore 1979 - 2001

Navy List		Seniority	Surname	First	Branch	DDG	Non DDG
1981	Jun	1979	Crawford	Ian	Supply	1	
1980	Jun	1980	West	Barrie	Supply		1
1982	Dec	1980	Gibbs	Brian	Supply	1	
1984	Jun	1984	Coulson	Donald	Supply	1	
1985	Jun	1984	Youl	Mervyn	Supply		1
1986	Jun	1985	Gulliver	Kelvin	Supply		1
1987	Jun	1986	Mulcare	Philip	Supply		1
1987	Jun	1986	Taylor	William	Supply		1
1989	Jun	1988	Campbell	David	Supply	1	
1990	Jun	1990	Forrest	Murray	Supply	1	
1992	Jul	1990	Letts	Robert	Supply	1	
1992	Jul	1991	Gashler	Paul	Supply		1
1992	Jul	1991	Thompson	Alan	Supply		1
1993	Jul	1991	Earley	Geoffrey	Supply		1
1997	Aug	1997	Scarce	Kevin	Supply	1	
2000	Aug	2000	Lemon	Sydney	Supply	1	
Grand Total					**16**	**8**	**8**

Table F-7 Supply Officers Promoted to Rear Admiral 1984 - 2001

Navy List		Seniority	Surname	First	Branch	DDG	Non DDG
1985	Jun	1984	Crawford	Ian	Supply	1	
1985	Jun	1985	West	Barrie	Supply		1
1994	Oct	1993	Campbell	David	Supply	1	
1995	Jul	1995	Forrest	Murray	Supply	1	
2000	Aug	1999	Scarce	Kevin	Supply	1	
Grand Total					**5**	**4**	**1**

Appendix G Commanding Officers of DDG Reaching Star Rank: 1971 to 2001

The following tables provide details of DDG Commanding Officers included as part of the investigation in terms of which Commanding Officers reached star rank.

The term 'Start' means the date of appointment in command as shown in the relevant *Navy List*. 'Years' means the duration of their command of the ship. The term 'Included' means whether this entry has been included in the analysis of officers who, for the purpose of this examination, met the criterion for being recognised in command. This means that the officer was posted in command when the ship was operationally ready for service, which included officers posted in command for trials periods and who then remained in command for a period of operational service. Officers who were nominally posted as the Executive Officer but who were posted in command on a temporary basis due to an absence of the officer nominally in command, or for some other reason, are also included. Periods in refit which excluded the consideration of some officers were obtained from multiple issues of *Navy News* and *Reports of Proceedings*.

Where officers were in command for more than one qualifying period, they have only been counted once for the purposes of calculating the number of officers who reached star rank.

Table G-1 HMAS BRISBANE - Commanding Officers[1]

Start	Last	First	Sub-Specialisation	Years	Include
16-Dec-67	Willis	Alan A.	Direction	1.84	Y
20-Oct-69	Beaumont	Alan	Torpedo & Anti-Submarine	0.21	Y
05-Jan-70	Stevens	John D.	Torpedo & Anti-Submarine	1.00	Y
05-Jan-71	Loosli	R. Geoff	Direction	1.95	Y
18-Dec-72	Rees	Peter	Communications	1.04	Y
01-Jan-74	Hudson	Mike W.	Navigator	1.64	Y
25-Aug-76	Burnett	Rory	Torpedo & Anti-Submarine	1.50	Y
18-Jan-78	Baird	R. Malcolm	Communications	1.00	Y
25-Feb-78	Howland	R.A	Torpedo & Anti-Submarine	0.42	N
28-Jul-78	O'Sullivan	Timothy	Direction	0.47	N
08-Nov-80	Dickson	Jim	Navigator	1.85	Y
14-Sep-82	Stubington	Edward	Navigator	1.82	Y
12-Jul-84	Elliot	Phillip	PWO (Gunnery)	0.14	Y
03-Sep-84	Doolan	Ken	Navigator	0.98	Y
26-Aug-85	Smith	Geoffrey	PWO (Gunnery)	1.30	N
16-Dec-86	Smith	Anthony P.	Submariner +	0.48	N

[1] Information for this table has been compiled from multiple editions of *The Navy List, Navy News* and http://www.navy.gov.au/hmas-brisbane-ii

Start	Last	First	Sub-Specialisation	Years	Include
10-Jun-87	Walls	Robert A.K.	Direction	1.53	Y
20-Dec-88	Stubington	Edward	Navigator	0.48	Y
13-Jun-89	Morton	Geoffrey	Gunnery	0.96	Y
29-May-90	Moffitt	Rowan	PWO (Navigation)	0.07	Y
25-Jun-90	Ritchie	Christopher	PWO (Anti-Submarine Warfare)	1.35	Y
30-Oct-91	Shackleton	David	PWO (Direction)	1.14	Y
19-Dec-92	Flint	Anthony	PWO (Direction)	2.04	Y
04-Jan-95	De Vries	Martin	PWO (Gunnery)	1.44	Y
15-Jun-96	Hart	Simon	PWO (Gunnery)	1.56	Y
05-Jan-98	Leschen	Peter	PWO (Navigation)	1.60	Y
12-Aug-99	Moffitt	Rowan	PWO (Navigation)	0.34	Y
14-Dec-99	Darby	Cameron	PWO (Navigation)	1.85	Y

Table G-2 HMAS HOBART – Commanding Officers[2]

Start	Last	First	Sub-Specialisation	Years	Include
18-Dec-65	Griffiths	Guy	Gunnery	1.74	Y
15-Sep-67	Shands	Kenneth	Direction	1.58	Y
14-Apr-69	Swan	Rothsay	Communications	2.64	Y
05-Jan-71	Robertson	John A.	Communications	1.34	Y
08-May-72	Nicholson	Ian	Communications	1.05	Y
28-May-73	Lattin	Jerry	Torpedo & Anti-Submarine	0.28	Y
08-Sep-73	Knox	Ian	Torpedo & Anti-Submarine	1.25	Y
11-Dec-74	Sinclair	Peter	Gunnery	2.68	Y
17-Aug-77	Stubington	Edward	Navigator	0.18	Y
23-Oct-77	Kennedy	Philip	Torpedo & Anti-Submarine	1.27	Y
31-Jan-79	MacDougall	Ian D.G.	Submariner +	0.03	Y
11-Feb-79	Kennedy	Philip	Torpedo & Anti-Submarine	0.37	Y
26-Jun-79	Horton	Anthony	Navigator	1.43	Y
01-Dec-80	Adams	Harry J.P.	Communications	1.10	Y
07-Jan-82	Thomson	David H.	Navigator	0.99	Y
03-Jan-83	Stoker	Nigel	Torpedo & Anti-Submarine	1.18	Y
08-Mar-84	Flindell	Kenneth	PWO (Anti-Submarine Warfare)	0.01	Y
11-Mar-84	Caton	Derek	SMN	0.77	N
17-Dec-84	Bateman	Walter S.G.	SMN	1.44	Y
27-May-86	Farthing	David	Pilot	2.48	Y
18-Nov-88	Wellham	Gordon	PWO (Anti-Submarine Warfare)	0.33	N

[2] Information for this table has been compiled from multiple editions of *The Navy List*, the *Navy News* and http://www.navy.gov.au/hmas-hobart-ii

Start	Last	First	Sub-Specialisation	Years	Include
20-Mar-89	Haynes	Wayne	PWO (Direction)	1.04	N
04-Apr-90	Hart	Simon	PWO (Gunnery)	1.08	N
06-May-91	Lord	John	PWO (Navigation)	1.51	Y
09-Nov-92	Dovers	William A.G.	PWO (Gunnery)	1.35	Y
18-Mar-94	Stapleton	James	PWO (Gunnery)	1.85	Y
17-Jul-96	Mapson	Greg	Mine Clearance Diver	0.15	N
09-Sep-96	Woolrych	Simon	PWO (Direction)	1.75	Y
12-Jun-98	Murray	Peter	PWO (Anti-Submarine Warfare)	1.92	Y

Table G-3 HMAS PERTH – Commanding Officers[3]

Start	Last	First	Sub-Specialisation	Years	Include
17-Jul-65	Cartwright	Ian	SMN	0.98	Y
11-Jul-66	Doyle	Peter	Navigator	0.38	Y
27-Nov-66	Knox	Ian	Torpedo & Anti-Submarine	0.04	Y
10-Dec-66	Doyle	Peter	Navigator	1.33	Y
15-Apr-68	Leach	David	Gunnery	1.13	Y
02-Jun-69	Thomson	David H.	Navigator	0.61	N
09-Jan-70	Burnside	Ian	Navigator	1.85	Y
14-Nov-71	Freeman	Michael	Navigator	0.04	Y
01-Dec-71	Percy	Robert	Direction	1.49	Y
29-May-73	Nicholson	Ian	Communications	0.70	Y
09-Feb-74	Hutson	Peter	Gunnery	2.26	Y
15-May-76	Johnston	Eric	SMN	1.64	Y
06-Jan-78	Berger	Howard	Direction	2.00	Y
29-Jan-80	Cummins	Adrian	Gunnery	1.81	Y
18-Nov-81	Chalmers	Don	Navigator	0.85	Y
27-Sep-82	Parsons	Jim	PWO (Gunnery)	0.12	Y
09-Nov-82	Chalmers	Don	Navigator	0.34	Y
13-Mar-83	Pfennigwerth	Ian	Communications	1.77	Y
19-Dec-84	Sloper	Graham	Torpedo & Anti-Submarine	1.07	Y
14-Jan-86	Sulman	Leonard	Navigator	0.98	Y
08-Jan-87	Whitehouse	Ian	PWO (Navigation)	0.92	N
09-Dec-87	Smith	Martin	PWO (Anti-Submarine Warfare)	1.48	N
01-Jun-89	Oxenbould	Christopher	PWO (Navigation)	1.33	Y
28-Sep-90	Purnell-Webb	Philip	PWO	0.07	Y
22-Oct-90	Cox	Timothy	PWO (Anti-Submarine Warfare)	1.32	Y

[3] Information for this table has been compiled from multiple editions of *The Navy List,* the *Navy News* and http://www.navy.gov.au/hmas-perth-ii

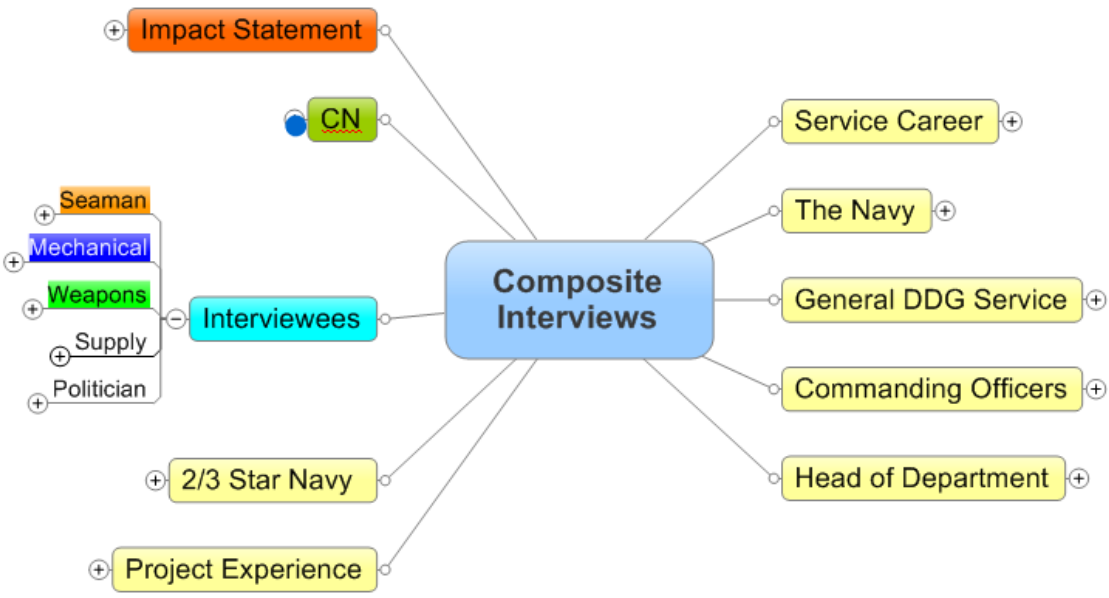
Start	Last	First	Sub-Specialisation	Years	Include
15-Feb-92	Walpole	Geoffrey	PWO (Communications)	1.31	Y
07-Jun-93	Shalders	Russ	PWO (Anti-Submarine Warfare)	1.19	Y
17-Aug-94	Ladomirski	Antony	PWO (Communications)	0.42	Y
16-Jan-95	Smith	Geoffrey	PWO (Gunnery)	1.50	Y
17-Jul-96	Robertson	Brian	PWO (Communications)	1.74	Y
14-Apr-98	Rago	Lou	PWO (Navigation)	1.50	Y

Appendix H Interview Structure and Questions

General Structure

Interviews for this research were structured using the model summarised in Figure H-1. It was designed to permit exploration of responses to questions concerning the DDGs but structured around the careers and experiences of those interviewed. Interviewees were from multiple backgrounds and collectively spanned the full range of specialist groups of the RAN; hence not all questions were of equal application or importance to all interviewees. The headings were used to guide conversations and enable exploration of matters as they emerged, and a full listing of questions is shown on the following pages. Guidance was taken from authoritative sources[1] in both choosing questions and permitting individuals to answer as expansively as they were able. Through adopting that mechanism it is considered that the quality of responses was as accurate in recollection as they were able to provide, and provides credible evidence in support of the research.

Figure H-1 Summary of Interview Model



Ethical Research

Compliance was maintained with procedures applicable for human research as stipulated by the Department of Defence and University of NSW.

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[1] Robert Perks and Alistair Thomson, *The Oral History Reader*, 2nd ed. New York: Routledge, 2006 and Donald A. Ritchie, *The Oxford Handbook of Oral History* New York ; Oxford: New York ; Oxford : Oxford University Press, 2011

Interview Questions

Numbers of interviewees were selected in proportion to the RAN's Branch sizes[2] and who met as much as possible of the following criteria:

- Were involved in the acquisition of the DDGs, their operation, maintenance, support and evolution of capability.
- Served with or operated with the Royal Navy.
- Served with or operated with the USN.
- Served in the Department of Defence.
- Served in Navy Office or organisations related with the life cycle of the DDGs.

The purpose of the interviews was to be able to draw conclusions regarding any enduring DDG impact on the RAN in terms of its:

- War-fighting capability
- People
- Culture – including leadership
- Technical expertise
- Operational expertise
- Doctrine
- Preparation for the future
- Implications of the DDGs for the RAN at large

Questions were structured under the following headings:

Service Career

Early

- Where did you join the Navy from?
- Why did you join the Navy?
- What were your aspirations when you joined the Navy?
- What were some of the most notable experiences you can recall from your early days in the Navy?

Mid

- Did your aspirations change as your career progressed? If so, (a) how, and (b) why?
- What were some of the most notable experiences you can recall from this period in your career?

Later

- What were your aspirations at this point in your career?
- What were some of the most notable experiences you can recall from this period in your career?

RN Experiences

- What experience did you have with the RN?

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[2] The Branches were: Seaman (Executive), Engineering (both Mechanical and Weapons Engineering), and Supply and Secretariat.

- How applicable was it to the RAN?

USN Experiences

- What experience did you have with the USN?
- How applicable was it to the RAN?

RAN culture over your career

- What changed?
- Why did it change?
- Was it for the better or worse?

The Navy

Was the RN legacy a good one?

- What were its main strengths and weaknesses?
- Did we have our own views about how to run a navy?
- Did the RAN rely on the RN for too long?

Was the RAN ready for DDGs from the following perspectives?

- Technical
- Operational
- Support
- Education
- Training
- Conception of its mission as a Navy

What was the initial impact on the RAN?

- Big/medium/small - why

What was the RAN like when you first went to a DDG from the following perspectives?

- Morale
- Conditions of service
- Public recognition and support for its Navy
- Comprehension of its own strengths and weaknesses as a Navy
- Recruiting and Retention
- What its future looked like and why did it look that way
- The general culture of its officers and sailors

General DDG Service

- What DDG postings did you have and when?
- How were you selected?
- How well were you equipped for the posting(s)?
- Was everybody well prepared?
- Is your recollection of DDG service primarily positive or negative?
- Why?

What was the difference between DDGs and other classes of destroyers or frigates you served in and how do they compare?

Which other ships?

- Mission
- Capabilities
- Professionalism
- Technical
- Support
- Comfort
- Culture

Personnel issues

Interviewees were asked a series of questions relating to their experiences in a variety of contexts. In addition, there were questions that related directly to positions in which only some the interviewees had served. Not all areas of investigation were applicable to all interviewees.

Officers

- ***Warfare***
- ***Technical***
- ***Supply***
  - Was there any difference from previous ships?
  - What did you like most and least?
  - Was there a DDG 'club'?
  - Were they effective in contemporary operations – if so why – if not - why?
  - How well did the Navy prepare its people?
  - How much posting churn did you have?
  - Was it a problem?
  - As a Commanding Officer (Not all interviewees)
  - Was there any difference from previous Commands?
  - What did you like most and least?
  - Was there a DDG 'club'?
  - Were they effective in contemporary operations?
  - How well did the Navy prepare its people?
  - How well were you supported?
  - How much posting churn did you have?
  - Was it a problem?

As a Head of Department (Not all interviewees)

- Was there any difference from previous HOD?
- What did you like most and least?
- Was there a DDG 'club?'?
- Were they effective in contemporary operations?
- How well did the Navy prepare its people?
- How well were you supported?

- How much posting churn did you have?
- Was it a problem?

In your Project Experience (Anzac project and/or FFG project, and/or Collins) (Not all interviewees)

What were your

- Roles,
- Responsibilities, and
- Broad organisational arrangements?

What level of authority did you have?

What were the coordination arrangements?

Were they effective?

- What problems did you experience?
- What were the outcomes?
- What lessons were learned?

At 2/3 Star Navy (Not all interviewees)

How much effort did you have to devote to DDG matters?

What concerns did you have about their capabilities?

- Potential threats
- Technical support
- Training
- Education
- Did you ever feel that their capabilities were insufficient for what was needed?
- How do you think the RAN changed because of the DDGs?
- Was your relationship with the USN different to the RN?
- What political challenges did you have concerning DDG?
- How was the decision reached to decommission the ships?
- What was your view about their role in the RAN?
- How was the evolution of the capability of these ships managed?
- How effective was it?
- What were the issues involved in this process?

As Chief of Navy (CN) (Not all interviewees)

What was the RAN like when you were CN?

- Political circumstances
- Defence circumstances
- Morale

What were the circumstances of each of the following when you were CN?

- Public support
- Recruiting
- Retention

- Current and future capabilities

How did you choose Commanding Officers for DDGs?

Did DDGs have a special place?

- Why?

As Vice Chief of the Defence Force (VCDF) (Not all interviewees)

What was the RAN like when you were VCDF?

- Political circumstances
- Defence circumstances
- Morale

What were the circumstances of each of the following regarding the Navy when you were VCDF?

- Public support
- Recruiting
- Retention
- Current and future capabilities

IMPACT OF THE DDGs

- What was the impact on you as a member of the RAN – can you give any examples of where the DDGs made an impact on your professional naval life.
- What was the impact on the RAN as a whole - can you give any examples of where the DDGs made an impact on the RAN.

SUMMARY

- Do you have any other information you would like to add?

Appendix I Interviews Conducted and Biographical Details

Overview

This Appendix contains a list of those interviewed for the thesis and summarises their career backgrounds in a manner so as to indicate their relevance. A total of 23 recorded interviews were conducted, each taking on average approximately two hours and collectively accumulating 1117 pages of transcript.

With few exceptions, all those interviewed had first-hand knowledge of the DDGs from serving in the ships on one or more occasions during their careers, and/or could knowledgeably discuss their impact on the RAN in an informed manner. Many subsequently became senior officers with major responsibilities for naval and defence policy development. All were chosen because their experience and knowledge was relevant to the study. Career summaries have been developed from information provided by the interviewees.

Summary Table of Interviewees

The Hon Kim Beazley was serving Ambassador to the United States and Commodore Richard Menhinick was a serving officer of the RAN at the time of their being interviewed. The ranks of naval officers given are those held at the time of their retirement from the RAN. Table I-1 lists the names of interviewees alphabetically by primary specialisation. A short alphabetically listed summary of their careers follow.

Table I-1 Summary of Interviewees

Branch	Name	Vice Admiral	Rear Admiral	Commodore	Captain	Commander	Mr	Hon
Seaman	David Cotsell				1			
	Donald Chalmers	1						
	Guy Griffiths		1					
	Robert Hall					1		
	David Leach	1						
	Richard Menhinick			1				
	Ian Pfennigwerth				1			
	Christopher Ritchie	1						
	Robert Walls	1						
Seaman Total		4	1	1	2	1		
Marine Engineer	Robert Mummery					1		
	Maxwell Reed		1					
	Trevor Ruting		1					

Branch	Name	Vice Admiral	Rear Admiral	Commodore	Captain	Commander	Mr	Hon
Marine Engineer Total			2			1		
Weapons Engineer	Antony Anderson					1		
	Ormsby Cooper			1				
	Ian Holmes			1				
	Oscar Hughes		1					
	Peter Purcell		1					
	Christopher Skinner				1			
Weapons Engineer Total			2	2	1	1		
Supply	David Campbell		1					
	Ian Crawford		1					
	Murray Forrest		1					
Supply Total			3					
Technical Services	Andrew Johnson						1	
Technical Services Total							1	
Federal Government	Kim Beazley							1
Federal Government Total								1
Grand Total	**23**	**4**	**8**	**3**	**3**	**3**	**1**	**1**

Commander Antony Anderson

Antony Keith Anderson joined the RAN in 1963 as a sailor apprentice tradesman. After practical training in HMAS *Sydney* he attended six months training in the United States to qualify as a maintainer for the DDG Guided Missile Launcher System, and was then posted to *Brisbane* for its first Vietnam deployment.

He became an officer in 1971, underwent training in the United Kingdom, and returned as the Tartar and Gun Systems engineer of *Brisbane*. He later undertook a comprehensive 12-month training course in the relatively new Naval Combat Data System (NCDS) before joining *Perth* as the NCDS engineering officer. Anderson then spent time in the USA attached to the USN Superintendent of Shipbuilding, Conversion and Repair as the Waterfront Coordinator for the construction of Australian and USN Perry class FFGs.

He became the Weapons Engineering Electrical Officer of *Perth* and later the Project Officer for the modernisation of *Perth* and *Hobart* in the second major modernisation project for the DDGs. In this latter role he was also responsible for the weapons upgrades required for *Brisbane* before its deployment to the first Gulf War.

Anderson transferred to the Australian Public Service in 1998 where he continued in his then position as a member of the Anzac Ship Project. His background as a sailor and an officer and wide ranging experience, primarily with ships of USN-origin, make him a significant source of knowledge about their capabilities and development.

The Hon Kim Beazley, AC

Mr Beazley was elected to the Federal Parliament in 1980 and represented the electorates of Swan (1980-96) and Brand (1996-2007).

He was a Minister in the Hawke and Keating Labor Governments (1983- 96) holding, at various times, the portfolios of Defence, Finance, Transport and Communications, Employment Education and Training, Aviation, and Special Minister of State. He was Deputy Prime Minister (1995-96) and Leader of the Australian Labor Party and Leader of the Opposition (1996-01 and 2005-06). Mr Beazley held the appointment of Australia's Ambassador to the United States of America from February 2010 until January 2016.

Mr Beazley was the sponsor of the 1986 Dibb Review of Australia's defence capabilities, and Minister responsible for the 1987 Defence White Paper.

Rear Admiral David Campbell, AM

David John Campbell joined the RAN as a Cadet Midshipman at the RAN College in 1961. After initial training in Australia, the United States and the United Kingdom, he specialised as a Supply Officer.

He was the Deputy Supply Officer and then Supply Officer of *Hobart* during its third deployment to Vietnam where he saw the way in which the USN supported its ships. He later attended the US Navy Supply School and underwent advanced training at the Virginia Polytechnic Institute and State University in logistic support. Campbell applied the knowledge gained in postings associated with RAN support of new and existing platforms and systems. He was the Naval Attaché in Washington DC during the first Gulf War and was closely involved in addressing various logistical and operational support requirements for RAN units operating as part of the US lead coalition force in the Persian Gulf.

Following a posting as the Deputy Chief of Naval Staff, he became the Naval Support Commander with responsibilities for all logistic support for RAN operations. He retired from the RAN as Head Strategic Logistics, a Defence position in which he was responsible for logistics policy for the whole ADF.

Vice Admiral Donald Chalmers, AO

Donald Bruce Chalmers joined the RAN in 1958 as a Cadet Midshipman. After initial training in Australia and with the Royal Navy, he qualified as a Seaman Officer and served in a number of RAN ships participating in Indonesian confrontation operations. He then qualified as a Long Course Navigating Officer with the RN and underwent two years exchange service in the UK.

After navigating *Brisbane* and *Melbourne*, he attended the USN War College and commanded *Perth*, which deployed with a USN Battle Group during heightened Cold-War operational circumstances in the North West Indian Ocean. As a Commodore, he led the team conducting a comprehensive assessment of the RAN officer corps, intended to create the future officer career development framework. As Commodore Flotillas (COMFLOT), Chalmers commanded the initial RAN task group which deployed in August 1991 to support first Gulf War operations. As a Rear Admiral he was the Maritime Commander with responsibility for command of all operational forces of the RAN, followed by a period as Assistant Chief of Defence Force-Development (ACDEV) with responsibility for defining and gaining Government approval of all future major capabilities of the ADF.

Chalmers became the Chief of Navy in 1997, responsible for the command of the RAN including its administration and organisation. His wide ranging career and close interaction with the RN and USN provided him with perspectives of both navies, and he was witness to many changes in the RAN over a career of 41 years. He was one of the series of Chiefs who had commanded a DDG.

Commodore Ormsby Cooper

Ormsby Cooper joined the Navy in 1950 as a Cadet Midshipman. After basic training in the United Kingdom he returned to Australia and studied Electrical Engineering at Melbourne University, becoming one of the first RAN electrical officers to graduate.

He underwent DDG technical training in the United States and joined *Perth* while it was under construction in the USA. On its return to Australia, he remained in the ship as the liaison engineer during installation and acceptance of the Ikara missile system, and was onboard *Perth* for its first Vietnam deployment as the gunnery system weapons engineer. He was the Weapons Electrical Engineering Officer of *Hobart* in 1971/72 when a further Vietnam deployment was cancelled after the Australian Government decided that no further ships would undertake that mission.

Cooper was the inaugural head of the Naval Systems Engineering Group at the Combat Data Systems Centre in Canberra, the land based development and testing centre for the new Naval

Combat Data System (NCDS) to be installed in all three DDGs. He visited the United States to build linkages with the USN and inspected *Perth* during its equipment update at Long Beach shipyard. He later undertook a major study of digital systems in RAN service, and to enter service, and arrangements for support of their software, which found that the Navy had not prepared itself well for the digital age. Cooper believes then that study and its ramifications were not well understood by the senior officers of the Navy.

Captain David Cotsell

David Barry Cotsell joined the RAN in 1966 as Midshipman under the short service Supplementary List (Seaman) scheme. He was awarded a Naval Board commendation for his service in *Hobart* during its second Vietnam deployment and was on watch when a USAF aircraft attacked the ship, killing two sailors and causing considerable damage. He became the first incumbent of the newly established position of Flag Lieutenant to the Chief of Naval Staff, which enabled him to gain an understanding of how the larger Naval and Defence organisations functioned at the strategic level. Cotsell then undertook warfare training with the RN and joined *Perth* as the Communications Officer as it was being modernised with NCDS in the United States. He was later posted as warfare officer (gunnery) to *Hobart*, and completed advanced warfare training with the RN, at which time he sub-specialised in Communications.

Cotsell completed an advanced communications technology program at the Royal Military College Shrivenham (UK), and then became the Director of Electronic Warfare (Navy) on the Naval staff. His final posting was as Director of Naval Communications, responsible for all RAN communications policy and capabilities. He participated as a Naval Reservist in several advanced studies concerning communications and information technology issues affecting the Navy and the ADF. Cotsell's wide ranging career enabled him to see how the RAN evolved from a predominantly RN oriented organisation into one with a greater sense of its own requirements with the associated difficulties involved in that transition.

Rear Admiral Ian Crawford, AO

Ian Crawford joined the RAN in 1949 as a Cadet Midshipman in the Supply and Secretariat specialisation. He completed initial training in Australia and then with the RN, returning to Australia having served on the East Indies and Far East Stations including 1950-1951 service in Korea.

Crawford was posted at short notice to the Washington DC to support expansion of the staff of the Australian Naval Attaché precipitated by Australia's acquisition of the DDGs. He joined *Perth* as its Supply Officer as it was building. He undertook supply training with the USN in

1965, and in his view, the USN Supply organisation was far more professional than that of the RAN. Crawford's experiences led him to advocate major changes in how the RAN undertook comparable activities. During his posting as Secretary to the CNS he worked to ensure that Navy Office was better organised and that a distinction was maintained in the Headquarters between policy and its implementation.

As the Chief of Defence Supply he initiated changes across all of the ADF intended to apply many of the procedures used by the USN, and the United States military more broadly, for the benefit of ADF logistical support.

Rear Admiral Murray Forrest, AM

Murray Bruce Forrest joined the RAN in 1958 as a Cadet Midshipman. After training at the RAN Naval College and in the UK, he commenced a career as a Supply Officer. At that time, officers in the RAN received limited training in supply matters, and were more typically employed in Secretarial responsibilities on the staff of a senior officer.

As a relatively junior officer he was selected as *Hobart's* Deputy Supply Officer as it was building in the United States, and then participated in its first Vietnam tour. There he saw how differently and in superior fashion the USN supported its ships logistically than did the RAN. Forrest subsequently became Supply Officer of *Hobart* and later the Officer in Charge of the RAN Supply School where changes were being implemented in the curriculum to adopt many USN practices. He achieved changes in navy support methods as Director General of Naval Logistic Policy. He was witness and a champion of changes made by the RAN to increase its professionalisation in logistics management brought about by his exposure to USN methods commencing with the DDGs.

Rear Admiral Guy Griffiths, AO, DSO, DSC

Guy Richmond Griffiths joined the RAN as a Cadet Midshipman in 1937. After initial training he went to the UK for service with the RN, which included being in the battle cruiser HMS *Repulse* when it was sunk by the Japanese. He later had active service in the Korean War and underwent further training with the RN, qualifying as a Long Course Gunnery Officer.

Griffiths was the commissioning Commanding Officer of *Parramatta*, a River class frigate of British design built in Australia, and then of the DDG *Hobart*. In taking delivery of *Hobart* he arranged for it to undergo a full workup with the USN Fleet Training Group, and later successfully advocated the RAN adopt a similar training regime to replace its ad-hoc arrangements then in place. He commanded *Hobart* on the first operational deployment by an

RAN DDG to Vietnam where the ship was taken under hostile fire on several occasions. He later he commanded the carrier HMAS *Melbourne*.

Griffiths' career spanned the RAN's early stages of its transition from the RN and introduction of the DDGs into service. He was instrumental in improving higher level educational opportunities for naval officers by establishing the RAN Staff College and his extensive experiences with the RN, RAN and USN during combat operations gave him considerable insights into each Navy and its capabilities.

Commander Robert Hall

Robert Norman Hall joined the RAN as a Cadet Midshipman in 1960. After initial training in Australia he undertook further training with the RN. He served as a Seaman Officer in HMAS *Vendetta* before joining *Brisbane* in the United States as it was being built. He participated in *Brisbane*'s first Vietnam deployment, which was followed by a posting to the UK where he completed the Long Direction course followed by exchange service with the RN.

Hall was the Direction Officer of *Perth* when it underwent the RAN's first modernisation with NCDS in 1974/5, undertaken at the USN shipyard in Long Beach. He had responsibilities for the operational performance of the new system. He joined the Combat Data Systems Centre (CDSC) in Canberra as Head of the Operational Design Group, a small cohort of operationally qualified officers whose responsibilities included developing operational improvements to the software of NCDS. Hall then became Director of the Action Information Tactical Trainer (AIOTT) Project, intended to provide simulation equipment for training at *Watson*, including for NCDS fitted DDGs and FFGs.

His career gave him insights into the differences and strengths and weaknesses of the RN, the USN, and the RAN, and the difficulties associated with introducing a new digital system into RAN service.

Commodore Ian Holmes, AM

Ian Fletcher Holmes joined the RAN in 1952 as a Cadet Midshipman. After initial training he qualified as an Ordnance Engineer in the UK. He had several years of experience with RN derived gun systems fitted to the RAN Daring class destroyers.

In 1964 Holmes was posted to the United States for DDG weapons and sensor training courses, and then posted as a member of the commissioning crew of *Hobart*. He participated in *Hobart*'s first deployment to Vietnam as the gun system weapons engineer and later participated in the RAN enquiry into the accidental USAF attack on *Hobart* in its second deployment, which caused significant damage and two fatalities.

Holmes had a range of senior postings, including being Project Director for acquisition of the FFGs from the USN. His experiences of the USN training system and of how the USN manned their DDGs contributed to the RAN adopting a similar systems management regime for sensors and weapons, and *Hobart* was the first ship to adopt this approach. As Director General of Fleet Maintenance he was responsible for development and oversight of RAN policy concerning maintenance of operational units. Holmes' career spanned a period of change in the RAN and he had considerable experiences of both the RN and USN, which permitted him to observe differences in professional practices as well as cultural dissimilarities between all.

Rear Admiral Owen Hughes,[1] AO

Owen (Oscar) John Hughes joined the RAN as a Cadet Midshipman in 1951. After initial training he completed a degree in Electrical Engineering, becoming one of the first officers in the RAN to become so qualified. On graduation, and on completion of further training, he became attached to the Fleet Air Arm as an Air Electrical Engineering Officer.

After progressively increasing responsibilities, Hughes became Project Director for the Replacement Aircraft Carrier Program, intended to replace the carrier *Melbourne*. The project was controversial; on election of the Labor government in 1983 it was cancelled. In 1985, he became Director of the Collins class submarine project to build six modern conventional submarines in Australia. This was Australia's largest defence capital acquisition program to date. On retirement from the Navy in 1993, he had been leader of the Collins project for 8 years.

Hughes did not serve in the DDGs or have a direct relationship with them. But through his wide-ranging naval career and roles in directing two of the largest Australian Defence projects of the second half of the 20th century, he was keenly aware of the influence of the DDGs on the RAN and of its efforts to accommodate them in its order of battle. His extensive experience included comprehensive involvement with the RN and USN as well as with the most senior leadership of the RAN, and his views are those of an astute and informed observer who witnessed much change in the Navy.

Mr Andrew Johnson

Mr Andrew Johnson was the Engineering Director of the RAN Submarine Warfare System Centre at HMAS *Watson* which culminated 11 years of him working in Australia, the US and Europe on various RAN submarine projects. He departed the Public Service and became Director of Computer Sciences Corporation's Australian and NZ, Defence and Communications

[1] Rear Admiral Hughes died on 23 September 2014.

Division. Johnson's responsibilities included developing combat system software and providing shore facilities for Anzac frigates, Collins submarine and Seahawk helicopters, and the initial Jindalee Over the Horizon Radar project. Following, he became Chief Executive Officer Tenix Defence Systems and during his leadership the business grew from being a shipbuilder with the 10 frigate Anzac Ship project, to Australia's then largest defence contractor with five Divisions covering all three Services and with significant international and commercial business.

Johnson's close working relationship with the RAN over an extended period of time gave him the opportunity to observe its personalities, culture, strengths and weaknesses, and gain insights into how it did, or did not, act as an organisation preparing for the future.

Vice Admiral David Leach, AC, CBE, LVO

David Willoughby Leach joined the RAN in 1942 as a Cadet Midshipman. After training in Australia and with the RN he qualified as a Seaman Officer. He subsequently qualified as a Long Course Gunnery Officer with the RN. Leach commanded the Daring class destroyer of British design, HMAS *Vendetta*, and subsequently the DDG *Perth*, including during its second Vietnam deployment. He had a wide range of sea and staff postings, which included lengthy periods in the UK. He had three postings as a Rear Admiral before becoming Chief of Naval Staff in 1982.

Leach was CNS when options for the replacement of HMAS *Melbourne* were being assessed. The RN HMS *Invincible* had been chosen for acquisition, but this decision was overturned and *Melbourne* left service without replacement. He was responsible for guiding the RAN through considerable change as it adjusted to losing its flag ship and fixed wing Fleet Air Arm.

David Leach was the first officer who had commanded a DDG to become the CNS, and the first in a lengthy and virtually continuous series of leaders of the RAN to be so qualified. He brought his experience and knowledge of USN methods and capabilities to the highest leadership level of the RAN.

Commodore Richard Menhinick, AM, CSC

Richard Temple Menhinick joined the RAN as a Cadet Midshipman in 1976. After junior officer training which included service in *Perth*, He completed RAN warfare training in 1987 and then a two year exchange posting with the RN as the Principal Warfare Officer (Gunnery) in the Type 42 destroyer HMS *Cardiff*. The ship completed a full work up and deployed for six months to the Persian Gulf.

He joined *Brisbane* as Direction Officer for its deployment to the first Gulf War and then became Fleet Direction Officer, responsible for evaluating the performance of operations room teams in RAN ships working up to operational proficiency. He was also responsible for developing Fleet air warfare and combat systems policy. After being Executive Officer of *Hobart* he became Head of the Operational Design Group at CDSC, responsible for guiding the evolution of NCDS.

As commissioning Commanding Officer of HMAS *Warramunga*, Menhinick critically examined and re-arranged how the Anzac Combat System was manned and fought. When later in command of HMAS *Anzac*, the ship conducted a deployment to European waters engaging in extensive maritime exercises with French and British forces to benchmark the RAN's performance. While on the Maritime Capability Development staff he was tasked with evaluating the Kidd class destroyers when first considered by the RAN.

His operational service in DDGs and an RN Type 42, direction of the evolution of NCDS, assessing options to replace the DDGs, and in command of two modern warships, makes Menhinick a particularly knowledgeable and experienced commentator on the impact of the DDGs on the RAN.

Commander Robert Mummery

Robert Browning Mummery joined the RAN in 1960 as an apprentice fitter and turner, and after qualifying as a tradesman and achieving the rank of Chief Petty Officer, was selected to become an officer specialising in mechanical engineering. He underwent officer training in the UK.

His career included serving in the carrier *Melbourne* and two postings to DDGs. Firstly as Deputy Marine Engineer Officer of *Hobart,* and secondly as the Marine Engineer Officer of *Perth* during its extended deployments to the North West Indian Ocean and then managing its complex comprehensive refit at Garden Island Sydney. In a wide ranging career he was responsible for RAN technical training policy development and delivery and for oversight of all engineering activities associated with naval vessels in Western Australia. Mummery's lengthy experience during a time of considerable change in the RAN's technical capabilities makes his contribution to this thesis highly relevant.

Captain Ian Pfennigwerth

Ian Elvins Pfennigwerth joined the RAN as a Cadet Midshipman in 1958. After initial training in Australia and consolidation training with the RN, he returned to Australia and qualified as a Seaman Officer. He underwent the Long Communications course with the RN and remained

on exchange service. His later postings to the United States gave him insights to modern USN communications and intelligence systems and methods, and how they were changing the way navies operated. He subsequently established the important RAN Tactical Electronic Warfare Support Section (RANTEWSS) which comprised personnel and equipment specialising in communications (COMINT) and electronic intelligence (ELINT).

Pfennigwerth served in *Brisbane* as the Communications and Operations Officer, and later commanded *Perth*. While in *Perth* he designed and applied methods to exploit features of NCDS different to those which had been conventionally utilised, including after its performance was degraded through battle damage. His experience thus is of considerable relevance to this study. He has earned a PhD in History and is the author of several books on the history of the RAN.

Rear Admiral Peter Purcell, AO

Peter Terence Purcell joined the RAN as a Cadet Midshipman in 1958. After initial training in Australia he qualified in the UK as an Electrical Engineer and underwent training in RN electrical application courses.

On return to Australia he was selected to undergo 12 months' training in the United States on DDG weapons and sensors. He then joined *Hobart* during its second Vietnam deployment and was on watch when the ship was attacked by the USAF aircraft which killed two RAN sailors.

He was later posted to the United States while *Perth* was modernised with NCDS under the management of the USN at Long Beach. On return to Australia he managed the same project for *Hobart* and on completion he was posted to *Hobart* as the Weapons Electrical Engineering Officer. He thus had extensive DDG engineering and operational experience before and after their modernisation with NCDS.

Purcell's last posting was as the officer responsible for all naval and land major capital acquisitions, drawing upon his extensive knowledge of USN engineering and support methods in doing so. His experiences with the RN, USN and RAN enable an expert comparative assessment of each Navy and its cultures, and give insights into the factors associated with major defence projects involving advanced technologies.

Rear Admiral Maxwell Reed, AO

Maxwell Peter Reed joined the RAN in 1936 as a Cadet Midshipman. After initial training he underwent training as a mechanical engineer at the Royal Naval Engineering College in 1940. He also subsequently trained as an Ordinance Engineer.

Reed was staff officer to the 3rd Naval Member of the RAN Naval Board when the choice was made to purchase the Adams class DDGs and privy to discussions between senior RAN officers as to which ship – US or British - offered the best solution. He had insights to matters being considered by CNS Vice Admiral Burrell when coming to his preference. Reed then became the liaison officer with the US Bureau of Ships where he represented RAN interests as well as oversighting minor modifications to the DDGs as they were constructed. Reed retired as the Chief of Naval Technical Services. His presences at the genesis of the DDG acquisition, then delivery of *Perth*, and later as the officer responsible for all RAN Technical policy and its application, allows him to shed light on early RAN approaches to project management and the early impact of the DDGs on both technical matters and the RAN more generally.

Vice Admiral Christopher Ritchie, AO

Christopher Angus Ritchie joined the RAN in 1965 as a Cadet Midshipman. After initial RAN preparation, he completed junior officer training with the RN. He subsequently qualified as a Seaman Officer in *Hobart* after which he commanded an LCH. Ritchie then completed Principal Warfare Officer training with the RN and on return to Australia became Anti-Submarine Warfare officer (ASWO) in *Derwent,* and then for the *Melbourne* Carrier Air Group.

After advanced warfare training with the RN he undertook almost three years exchange service as a member of the RN warfare teaching faculty located at HMS *DRYAD.* This period spanned the 1982 Falklands War and gave him insights as to RN preparations and its conduct. Ritchie then underwent staff training and gained experience before being appointed in command of the RAN Type 12 frigate *Torrens*. After further staff appointments he commanded *Brisbane* during its workup, deployment and involvement in the first Gulf War. The Commander of the RAN task group was embarked in *Brisbane* at that time.

Ritchie underwent the Royal College of Defence Studies course in the UK and was then promoted to Commodore. As a Rear Admiral, he had a range of command and senior staff appointments which included responsibilities for all ADF operations and then all ADF future capability requirements.

He became Chief of Navy in 2002, one of series of officers who had commanded a DDG who went on to command the RAN. In that role he was involved in selecting destroyers to replace the DDGs. In 2004 he entered into a Statement of Principles for Surface Warfare agreement with the USN and extended the extant similar agreement for submarine warfare. Ritchie thus had a wide ranging career including service in ships of both RN and USN-origin in a period of

transition for the RAN, and was able to comment authoritatively on matters associated with this study.

Rear Admiral Trevor Ruting, AM, CSC

Trevor Barnaby Ruting joined the RAN as a Cadet Midshipman in 1968. After completing a Naval Architecture degree at the University of NSW he completed extensive training as a Marine Engineering Officer with the RAN and RN. He later underwent postgraduate education and training in the UK as a naval architect.

Ruting became fully familiar with DDG propulsion and engineering capabilities through his experience as the Deputy Marine Engineering Officer of *Brisbane*, and later as Marine Engineering Officer of *Perth*. In the latter capacity he managed an extensive refit as well as meeting his sea-going engineering responsibilities.

He was involved in an important study which recommended changes to the RAN Officer Career Structure, making proposals for ensuring technical knowledge was provided to naval officers of all sub specialisations. As Chief Staff Officer Engineering (CSO-E) on Fleet Staff, he was responsible for all Fleet operational engineering matters.

Ruting was Director of the *Anzac* Ship Project, which produced 10 modern frigates for the RAN and RNZN. In his final posting, he was responsible for all Navy materiel matters including policy development and aspects of major capital acquisition. His knowledge of RN, USN and RAN engineering and support practices was extensive, and equipped him to make a professional assessment of technical risk as applicable to the RAN, and how the DDGs interacted with, and were affected by those risks.

Captain Christopher Skinner

Christopher John Skinner joined the RAN in 1959 as a Cadet Midshipman. After completing initial training in Australia, he graduated with an Electrical Engineering degree in the UK and completed RN equipment application courses. On return to Australia he became Deputy Weapons Electrical Officer of *Parramatta* and undertook a lengthy deployment to South East Asia.

Skinner underwent 9 months of DDG missile systems technical training in the United States and then joined *Hobart* for work up and its third Vietnam deployment. This was followed by assignment to the Mulloka development project, tasked with designing a hull-mounted sonar suitable for detecting submarines in Australia's undersea acoustic conditions. He then joined *Perth* for its NCDS modernisation in the United States and became its combat systems engineer. This was followed by a posting with the USN where he had responsibility for the test

and evaluation of all FFG-7 ships being constructed for the USN and RAN. Skinner was posted to *Brisbane* as the Weapons Engineer Officer after its NCDS update, and then became the inaugural Director for the New Surface Combatant Project, which evolved into the Anzac Ship Project.

Skinner had extensive DDG experience and his wide ranging postings with broad responsibilities coupled with extensive time in the UK and US provided him with significant insights into how the RN, USN and RAN conducted business, thus making an informed contribution to this study.

Vice Admiral Robert Walls, AO

Robert Andrew Kevin Walls joined the RAN in 1955 as a Cadet Midshipman. After training in Australia and consolidation in the UK he qualified as a Seaman Officer. Walls was posted at short notice to *Hobart,* then under construction in the United States, and participated in its first deployment to Vietnam where he gained combat experience as an aircraft controller. He then completed the Long Direction training course with the RN followed by approximately two years exchange service before returning as the Direction Officer of the un-modernised *Perth*.

Walls was subsequently posted as the Executive Officer of *Perth*, and later the Commanding Officer of *Brisbane* when it underwent the second of its major combat system upgrades and life extensions. In *Brisbane* he conducted sea trials to establish the technical and operational capabilities of those changes. As a Commodore, he was a senior member of the RAN staff when the 1986 Dibb Review and 1987 Defence White Paper was under development. He led the ADF team in identifying Australian options for operational commitment and support in the Persian Gulf prior to hostilities commencing in the first Gulf War.

As a Rear Admiral, he commanded all of the RAN's operational forces as Maritime Commander Australia and used DDGs as benchmarks of operational performance. He was then responsible for future ADF capability development as Assistant Chief of Defence Force Capability. Then, as Vice Chief of the Defence Force, Walls was intimately involved in the 1996 comprehensive Government review of Defence. Over his career Walls became a very influential officer in the RAN and broader ADF, and his experiences with the DDGs and more widely permitted him to speak authoritatively on those matters addressed in this study.

Appendix J Sources Provided to Sea Power Centre Australia

Overview

This Appendix provides a list of all material used in the thesis obtained through the Australian Department of Defence Archives, Sea Power Centre Australia and other non-public sources.

Classified Sources

Approval was granted by the RAN to access classified Government information at Defence Archives Queanbeyan, NSW and the Sea Power Centre Australia ACT. A body of relevant material was assembled which has enabled a more comprehensive understanding concerning the DDGs from their introduction through to their end of operational service.

Declassification of that material, which had not previously been available to public researchers, was requested and obtained by the author for use in this thesis. [1] The declassified material is first used publically here.

Unclassified Sources

Unclassified material was also obtained from all the locations listed above, and from Defence Archives located at Point Cook, Victoria.

Vice Admiral Peter Jones (retired) and Rear Admiral James Goldrick (retired) provided various RAN documents dating from the early 1960s. These documents had been obtained in the course of their earlier research work concerning the DDGs and are no longer available from official sources. They have assisted me in clarifying the choice of the Adams class over the British County class.

Summary of Sources

Table J-1 provides a list of the origins of material shown in Table J-2 with amplifying details.

Table J-1: Origins of Sources and Amplifying Details

Origin	Source
Peter Jones	Obtained from Jones and Goldrick
SPC-A	Obtained from records at the Sea Power Centre Australia, ACT
Max Reed	Provided by Rear Admiral Maxwell Reed
The Raytheon Company	Provided by Mr Tony Smith of the Raytheon Company of the United States
Defence Publishing Archive	Obtained from the Defence Archives at Point Cook, Victoria
UNSW Canberra Library	Obtained from library holdings of the UNSW (Canberra)
Queanbeyan Defence Archives	Obtained from Defence Archive records at Queanbeyan, NSW

[1] Navy Strategic Command Letter DDGCIT/OUT/2014/AB18936185 dated 5 August 2014 (Captain Andrew Masters RAN) and Sea Power Centre - Australia email 5 August 2014 (Mr Duncan Perryman)

Referencing System

A referencing system has been adopted to identify unique sources and enable their distinction from other material used in the thesis. It will also permit identification of the material held by the Sea Power Centre Australia. The system works thus:

SPC.DS.Num - where SPC = Sea Power Centre Australia, DS= David Shackleton provenance, and Num = the reference number assigned to the document.

Because referencing numbers were applied to sources as they became available and without regard to dates, and not all sources obtained were used in this thesis, document numbers and dates do not always appear sequentially.

List of Documents and Public Availability

Copies of all unclassified material listed in Table J-2 have been provided by the author to the Sea Power Centre Australia where they are now available for use by other researchers.

The left most column shows the origin of the document as obtained by the author (as shown in Table J-1), with the second column showing the date of the document. Abbreviated dates are given where the full date is not known. The right most column shows whether all or part of the document was required to be declassified.

Table J-2 Source Material Provided by Author to SPC-A

Source	Date	SPC.Num	Details	Declassified
Peter Jones	23-May-1961	1	Chief of Naval Staff advice to Minister proposing acceptance of US offer 23 May 1961	No
Peter Jones	20-Apr-1961	5	Minute from DCNS to CNS concerning helicopter advice for DDGs	No
Peter Jones	21-Mar-1961	6	Minute from 3NM concerning helicopter facilities on the Adams Class	No
Peter Jones	23-Mar-1961	7	Minute by CNS seeking finalisation of requirements for Adams Class	No
Peter Jones	29-Jun-1961	8	Minute from CNS to Minister advising acquisition of Adams Class "as is"	No
Peter Jones	26-Oct-1961	9	RAN File (Australian Consulate General New York): 1215-201-76: Purchase Order for 2 DDG 2 Class Destroyers Dated 26 October, 1961	No
Peter Jones	29-Mar-1961	10	Minute - 3NM advice to CNS concerning design of Adams Class	No

Source	Date	SPC.Num	Details	Declassified
SPC-A	10-Oct-1988	12.1	HMAS BRISBANE - Acceptance Board Report at Acceptance into Service (Report by Chairman of Acceptance Board) Navy File 18-12-55 10 October 1988	Yes
Peter Jones	20-Dec-1960	13	Navy File 211/207/3 - RAN Director of Weapons Minute: 'Implications of the Acquisition of the U.S. D.D.G.'S of the CHARLES F.A. ADAMS Class FOR THE RAN' Dated 20/12/1960	No
SPC-A	09-Dec-1961	16.1	USS Robison (DDG-12) CIC Standing Operating Procedures OPINST P05400.2 9 December 1961	Yes
SPC-A	15-Mar-1973	17.1	DDG NCDS Update - Factors and Installation Schedule Navy File 1215/51/405 C2/205/68 15 March 1973	Yes
SPC-A	17-Jun-1968	20	Accidental Attack on HMAS Hobart by US Aircraft in Vietnam Waters. Navy File 68/1381	No
SPC-A	01-Jul-1988	21.1	Guide to the Modernised RAN DDG 1 July 1988	Yes
SPC-A	01-Nov-2011	22	Australian Fleet Awards: Fleet/S4582123. Flag Officer Commanding HMA Fleet, 2011.	No
SPC-A	26-Oct-1954	23	Royal Australian Navy. His Royal Highness the Duke of Gloucester Cup (CNO 645/54)	No
SPC-A	2011	24	Royal Australian Navy. Gloucester Cup Winners 1947-2011	No
Peter Jones	30-Aug-1961	25	Minute CNS to Secretary recommending acceptance of Adams LOA. Navy File 1217/201/76 30 August 1961	No
Max Reed	1965	26	Reed, Maxwell. "The RAN Guided Missile Destroyer Project" The Institution of Mechanical Engineers.	No
The Raytheon Company	02-Feb-2010	27	STANDARD MISSILES Public Release Portfolio Revision F (2012).Power Point Slides ed. DSER # 214754	No
Defence Publishing Archive	01-May-1978	28	ABR 5296 - DDG Follow on Support Manual 1978	No
SPC-A	23-Feb-1959	36.1	Haul Down Report of Vice Admiral R. Dowling RAN Chief of Naval Staff	Yes

Source	Date	SPC.Num	Details	Declassified
SPC-A	08-Mar-1991	37.1	Haul Down Report of Vice Admiral M.W. Hudson RAN Chief of Naval Staff	Yes
SPC-A	22-Jan-1973	38.1	Haul Down Report of Rear Admiral W. Dovers RAN as Flag Officer Commanding HMA Fleet	Yes
SPC-A	30-Jun-1997	39.1	Haul Down Report of Vice Admiral R.G. Taylor RAN Chief of Naval Staff & Chief of Navy	Yes
SPC-A	03-Jul-2005	41.1	Haul Down Report of Vice Admiral C.A. Ritchie RAN Chief of Navy.	Yes
SPC-A	30-Jun-1969	45.1	Naval Combat Data Systems - A State of the Art Report -XC40 NHS 001 Serial 108 1626/204/415 30 June 1969	Yes
SPC-A	29-May-1973	46.1	Project Directive No 63 - Naval Combat Data System - XC40 NHS 001 Serial 104 1626/204/415 (N) 29 May 1973	Yes
SPC-A	01-Apr-1971	47.1	Naval Combat Data System Evaluation Report and Financial Statement Volume 2 - RAN Combat Data System XC40 NHS 001 Serial 116 Director General of Fighting Equipment April 1971	Yes
SPC-A	06-Nov-1975	48	Minute by NCSS PD - Responsibilities and Accountability of the NCDS PD	No
SPC-A	31-Aug-1970	50.1	Hughes Aircraft Company. Proposal for a DDG Tactical Data System for the Royal Australian Navy XC40 NHS 001 Serial 123 70D/C2620 31 August 1970	Yes
SPC-A	30-Sep-1976	51.1	Total Combat System Discussion Period 17 - 19 August 1976 XC40 NHS 001 Serial 127 30 September 1976	Yes
SPC-A	06-Jul-1968	53.1	Report of Proceedings HMAS HOBART June 1968	Yes
UNSW Canberra Library	01-Feb-1976	54	ABR 5016 - Regulations and Instructions for the Royal Australian Navy 1976	No
Defence Publishing Archive	01-Mar-1979	55	ABR 5245 - Royal Australian Navy Integrated Logistic Support Manual 1979	No
Defence Publishing Archive	01-Apr-1996	56	ABR 5287 - Royal Australian Navy Logistics Planning Data Manual - HMA Ships and Establishments 1996	No

Source	Date	SPC.Num	Details	Declassified
Defence Publishing Archive	01-Dec-1992	57	ABR 5476 - Shipboard NBCD Organisation, Damage Control, Firefighting and General Information	No
SPC-A	01-Dec-1991	59.1	HMAS BRISBANE Reports of Proceedings, January to December 1991	Yes
Queanbeyan Defence Archives	27-Jun-1991	60	Navy File 91-12103 Mixed gender accommodation HMAS Hobart	Yes
Queanbeyan Defence Archives	01-May-1991	61.1	RAN DDG Modernisation Project - Re-Engining of DDGs and Other Enhancements: Naval Engineering Services Branch: DDG Helicopter Feasibility Study 23 May 1991 Navy File 89-23269 Part 1	Yes
Queanbeyan Defence Archives	01-Jul-1989	62.1	RAN DDG Modernization Project Re-Engining of DDGs and Other Enhancements DNSP 66/89 Dated 4 July 1989 Navy File 89-23269 Part 1	Yes
Queanbeyan Defence Archives	01-Feb-1988	63.1	Project 1230 - DDG Modernization (Equipment Acquisition Strategy) dated February 1988 Navy File 91-28893 Part 1	Yes

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Appendix K DDGs and Exercise RIMPAC

Overview

The first Exercise RIMPAC (Rim of the Pacific) was held in 1971, and became the most important advanced international naval training exercise in which the RAN participated. It replaced and overtook in scale and complexity those conducted with the RN in the Far East and with SEATO. Until 1982, the RAN Flagship *Melbourne* took a leading role in RIMPAC and the embarked Flag Officer frequently exercised command of important phases of the exercise.[1] With *Melbourne*'s demise, the DDGs became the RAN's leading ships of those involved in the exercise.

This Appendix summarises the RAN involvement in RIMPAC from 1971 until 1998[2] and indicates the importance of the DDGs in helping build Australia's relationship with its major ally, the United States, whilst sustaining and building upon the advanced warfighting skills of the RAN.

Exercise RIMPAC

In May 1970, the RAN Flagship *Melbourne* led a task group of 11 RAN ships into Singapore after completing a major five-nation exercise led by the RN. The exercise was named "Bersatu Padu" and took place in the Singaporean and Malaysian military training areas.[3] The Australian Fleet Commander, Rear Admiral H.D. Stevenson, was embarked in the carrier and had been allocated a command role in the exercise. The training event was the last major exercise undertaken by the RN Far East Fleet prior to its withdrawal to UK home waters.[4] In October 1971, the first of a new series of naval training exercises known as Exercise RIMPAC was hosted by the USN in naval training areas near Hawaii, and has since become the world's largest international maritime training exercise.[5] At the same time as RIMPAC-71[6] was in its early stages, *Brisbane* was completing the RAN's final DDG tour of service with the USN 7th

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1 This did not include command of opposing forces, for which the RAN was first delegated in 1988.

2 1971 was the first year of the exercise; the year 1998 was the last time a DDG participated.

3 "Big RAN Entry in Singapore," *Royal Australian Navy News,* 29 May 1970, Vol13 No11, Page 1

4 Royal Australian Navy, *Warfare Officers Career Handbook*, ed. Naval Warfare Advisory Council Canberra: Royal Australian Navy, 2006 page 33

5 "RIMPAC 2014 - RIMPAC is the World's Largest International Maritime Exercise," Commander, U.S. Pacific Fleet, http://www.cpf.navy.mil/rimpac/2014/

6 The abbreviated year is added to the term RIMPAC to denote which specific exercise in the series is being referred to e.g. RIMPAC-71 means the RIMPAC exercise of 1971.

Fleet in conducting shore bombardment and other operations in support of the war in Vietnam.[7]

RAN ships participating in RIMPAC-71 included *Melbourne*, *Hobart*, the Type 12 frigates *Torrens* and *Yarra,* and the submarine *Onslow*.[8] This was the first time a DDG had operated as part of a deploying RAN task group, as opposed to working up and deploying independently for Vietnam operations with the USN 7th Fleet. *Hobart* had been scheduled to relieve *Brisbane* on Vietnam operations but its departure from Australia was cancelled by the Prime Minister (Mr McMahon). As an indication of the speed of the Government in making that decision, which seems to have taken the Navy by surprise, *Hobart* had completed its deployment preparations and was due to sail for Vietnam in the near future.[9]

Onslow had sailed for Hawaii and RIMPAC-71 sometime earlier, but the main RAN task group departed Sydney on 11 October 1971 with the Fleet Commander, Rear Admiral Dovers, embarked in *Melbourne* and exercising command of the force.[10] A subsequent report in *Navy News* noted the Minister for the Navy, Dr Mackay, as acknowledging the importance of the exercise in conducting tactical firings of the Australian designed and built Ikara anti-submarine missile system using the instrumented weapon testing ranges of the USN located in the Hawaiian area.[11] Commodore Nigel Stoker RAN assisted in the preparation of RIMPAC-71 and in that of RIMPAC-72, conducted the following year.[12] Lieutenant Graham Sloper became the first of a number of RAN officers awarded a citation by the USN for their work in planning and executing RIMPAC; Sloper was also involved with the first of the series in 1971 while on exchange service with the USN.[13]

Between 1971 and 1998, the RIMPAC exercise was held on 16 occasions, and the RAN participated in them all with a range of ships, aircraft and submarines, with the exercise progressively becoming more international in character and complex in its naval warfighting

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7 "Government Statements on Vietnam Withdrawal and Pay Increases," *Royal Australian Navy News,* 3 September 1971b, Vol14 No18, Page 1

8 "RAN Ships Sail for Hawaiian Exercise," *Royal Australian Navy News,* 15 October 1971, Vol14 No21, Page 6

9 "Admiral's Exchange Tributes," *Royal Australian Navy News,* 3 September 1971a, Vol14 No18, Page 2

10 Royal Australian Navy, *RAN Ships Sail for Hawaiian Exercise*

11 "Ikara Firing Success in Hawaii Exercise," *Royal Australian Navy News,* 10 December 1971, Vol14 No25, Page 1

12 "CDRE Stoker's 39 Year RAN Career," *Royal Australian Navy News,* 24 April 1992, Vol35 No7, Page 4. Stoker was of a more junior rank at the time of planning RIMPAC. He was promoted to Commander in 1971 See: Sea Power Centre Australia, *The Navy List September 1971* Canberra: Department of Defence (Navy), 1971, page 25

13 "US Navy Award," *Royal Australian Navy News,* 9 June 1972, Vol15 No12, Page 9

scenarios. The RAAF similarly increased its presence at RIMPAC with P3 Orion maritime patrol aircraft and F-111 strike aircraft providing significant contributions to the advanced nature of the training provided.[14] Table K-1 summarises RAN attendance for ships and submarines over that period and has been derived from *Navy News* articles shown in Table K-2. The names of RAN ships and submarines attending RIMPAC are shown in Table K-3.

On each of the seven occasions that *Melbourne* participated in RIMPAC, it provided the command platform for the Fleet Commander of the RAN task group. In addition to other ships, it was always accompanied by one or two DDGs whose role was to support the air defence of the task group and to take on some degree of delegated tactical responsibility.

Attendance at the exercise by the RAN Fleet Commander was a significant indication to the USN of the importance attached by the RAN to the exercise. Rear Admiral David Leach was the Fleet Commander for RIMPAC 80 (the last time *Melbourne* participated), and in regard to the USN he remarks that it gave him "…an insight into how they worked and I was much more impressed with their operations at planning and execution than some of the British exercises I'd done."[15] Additionally, the presence of Australian Charles F. Adams DDGs, as well as the USN-origin aircraft (A4 Skyhawk and S2E/G Trackers) operated by *Melbourne*, provided a basis for meaningful discussion between the RAN and USN about naval tactics, logistical support and other matters of professional interest. Although the RAN DDGs were not as technically advanced as the more modern ships of the USN, the professional experience of officers and sailors in the RAN ships was highly respected, as had recently been acknowledged by the USN concerning Vietnam operations conducted by the RAN.[16] The RIMPAC exercise continued the close association developed between the RAN and USN during Vietnam operations, with the RAN's surface combatant element being predominantly through the DDGs. The DDGs were instrumental in retaining an intimacy that might otherwise have been lost if the RAN, and Australia's Government, had not recognised the opportunity to build on its relationship with the United States as presented by RIMPAC.

With the loss of *Melbourne* and removal of the fixed wing capabilities of the RAN Fleet Air Arm, for most of their remaining service lives the Commanding Officers of DDGs became the task group commanders of the RAN contingent attending RIMPAC, and exercised command of those units assigned. Gaining such valuable experience was important professional development in higher command for officers who had already demonstrated their skills as

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14 "Pacific Bound," *Royal Australian Navy News,* 11 February 1977, Vol20 No3, Page 1

15 Interview with Vice Admiral David Leach, 14 March 2012. Page 23

16 Royal Australian Navy, *Admiral's Exchange Tributes*

competent naval officers. The DDGs did not possess all of the command and control capabilities of *Melbourne*, but the RAN considered that good results were nevertheless achieved. In 1996, the Commanding Officer of *Perth*, Captain (later Rear Admiral) Geoffrey Smith noted "…RIMPAC had been of enormous value to the RAN in polishing the Navy's ability to operate at the highest levels of maritime warfare…two aircraft carrier battle groups and all the expertise they bring…"[17]

In 1988 the Maritime Commander Australia, Rear Admiral Peter Sinclair, was given command of one of the two opposing forces participating in RIMPAC that year.[18] Sinclair was the first non-USN Flag Officer to be given that opportunity, reflecting the increased confidence in the RAN on the part of the USN gained through the continuing interaction of the two navies.[19] A subsequent Maritime Commander, Rear Admiral Robert Walls, was also given command during RIMPAC-92[20] when he became one of the designated battle force commanders.[21] To prepare for the RIMPAC role he undertook an extensive training program with his subordinate USN commanders in San Diego over a period of several months, gaining a much better understanding of the technical intricacies and personal relationships involved in the USN approach to command and control of large scale operations.[22] Walls' headquarters in Australia had been equipped with the same intelligence and command support system as used in the shore headquarters of the USN, which gave him important insights as to the manner by which afloat forces were commanded by the world's largest and most powerful Navy.[23]

The importance of RIMPAC was acknowledged in helping prepare the RAN for the first Gulf War. CNS Vice Admiral Hudson noted in his Haul Down Report:

> "… (RIMPAC) is the largest multi-national exercise in which the RAN participates..(and) is of immense value…in terms of providing opportunities to operate as a much larger force. Our personnel are exposed to advanced warfare systems and tactics…I am sure that our experiences …at RIMPAC have

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17 "RIMPAC Enormous Value," *Royal Australian Navy News,* 1 July 1996, Vol39 No12, Page 3

18 "RIMPAC Command to RAN," *Royal Australian Navy News,* 24 June 1988, Vol31 No12, Page 1

19 Sinclair was a former Commanding Officer of *Hobart*. "Destroyer Commanding Officers," http://hmashobartassqld.org/ship/ddg/destroyercomofficers.html

20 Interview with Vice Admiral Robert Walls , 6 October 2011. Page 35

21 Walls had previously commanded *Brisbane*. "HMAS Brisbane D-41 History - Commanding Officers," http://www.navsource.org/archives/05/01027.htm

22 Interview with Vice Admiral Robert Walls . Page 35

23 Aviation Week & Space Technology, "Electronic Intelligence - Royal Australian Navy (OBU for RAN)," *Aviation Week & Space Technology,* 131, 11, 1989, 117

significantly contributed to the ease with which our forces integrated with others in the Gulf Conflict."[24]

The presence of the DDGs in the RAN order of battle post-Vietnam, together with their participation in the RIMPAC exercises from their beginning provided an essential means of continuing and strengthening a professional RAN relationship with the USN, as well enhancing the ANZUS relationship in general. This interaction built upon a relationship which had been evolving with varying degrees of progress before and since WWII.[25] That the USN had sufficient confidence in the senior officers of the RAN to entrust them with high level command positions involving foreign command of US forces was a sign that the relationship had reached a level of maturity comparable with which the RAN previously had with the RN in South East Asia. The modern RAN experience of USN operations stemmed, in the main, through the involvement of the DDGs in USN activities, which therefore made an important contribution to the RAN professionally and enhanced Australia's international standing.

Table K-1 Summary of RAN Participation RIMPAC 1971 - 1998

Year/Class	Majestic	Adams	River	Perry	Durance	Tide	Oberon	Grand Total
1971	1	1	2				1	5
1972	1	2				1		4
1973	1	1	1					3
1975	1	1	1				1	4
1977	1	2	1			1	2	7
1978	1	1	1			1	2	6
1980	1	2	1			1	1	6
1982		2	2				2	6
1984			1	1		1	2	5
1986				2				2
1988		1	1	2	1		1	6
1990		1		2	1		1	5
1992		1		2	1		1	5
1994		1		2	1			4
1996		1	2	3	1		2	9
1998		2		2	1		1	6
Grand Total	7	19	13	16	6	5	17	83

[24] Royal Australian Navy, *Haul Down Report of Chief of Naval Staff: Vice Admiral M.W. Hudson RAN. Dated 8 March 1991. (SPC.DS.37.1),* Canberra: Sea Power Centre Australia. Page 14

[25] T. R. Frame, *Pacific Partners: A History of Australian-American Naval Relations* Rydalmere, N.S.W.: Hodder & Stoughton Australia, 1992, page 168

Table K-2 Navy News Reports of RIMPAC Participation

Year of RIMPAC	Navy News Edition	Note
1971	15 October 1971	26
1972	15 September 1972	27
1973	14 September 1973	28
1975	11 April 1975	29
1977	11 February 1977	30
1978	07 April 1978	31
1980	07 March 1980	32
1982	26 March 1982	33
1984	01 June 1984	34
1986	11 July 1986	35
1988	10 June 1988	36
1990	27 April 1990	37
1992	22 May 1992	38
1994	06 May 1994	39
1996	11 March 1996	40
1998	15 June 1998	41
2000	15 May 2000	42

26 Royal Australian Navy, *RAN Ships Sail for Hawaiian Exercise*, 6)

27 "Melbourne Task Group Sails for RIMPAC August 1972," *Royal Australian Navy News,* 15 September 1972, Vol15 No19, Page 1 HMAS *Stuart* joined during the voyage.

28 "24 Ships in RIMPAC Exercise," *Royal Australian Navy News,* 14 September 1973, Vol16 No18, Page 7

29 "International Exercise a 'Major Test' for RAN," *Royal Australian Navy News,* 11 April 1975, Vol21 No6, Page 3

30 Royal Australian Navy, *Pacific Bound*

31 "Passage to Pearl Over," *Royal Australian Navy News,* 27 April 1990, Vol33 No8, Page 6

32 "RAN Fleet Units Poised to Repel Air/Sea Attack in Mid Pacific Exercise," *Royal Australian Navy News,* 7 March 1980, Vol23 No4, Page 3

33 "RIMPAC Underway Off Hawaiian Coast," *Royal Australian Navy News,* 26 March 1982, Vol25 No5, Page 2

34 "Full Throttle for RIMPAC," *Royal Australian Navy News,* 1 June 1984, Vol27 No10, Page 1

35 "RIMPAC Flexes Muscle," *Royal Australian Navy News,* 11 July 1986, Vol29 No13, Page 7

36 "Courses Shaped for RIMPAC," *Royal Australian Navy News,* 10 June 1988, Vol31 No11, Page 6

37 Royal Australian Navy, *Passage to Pearl Over*

38 "Ships Leave for US," *Royal Australian Navy News,* 22 May 1992, Vol35 No9, Page 3

39 "Task Group Farewelled," *Royal Australian Navy News,* 6 May 1994, Vol37 No8, Page 14

40 "Worked Up and Ready for Hawaii," *Royal Australian Navy News,* 11 March 1996, Vol39 No4, Page 1

41 "Ships Head Out for RIMPAC 98," *Royal Australian Navy News,* 15 June 1998, Vol41 No11, Page 3

42 "Submarine to Test Ships Capabilities," *Royal Australian Navy News,* 15 May 2000, Vol43 No9, Page 1

Table K-3 RAN Participation RIMPAC 1971 - 1998

Year & Participant	Majestic	Adams	River	Perry	Durance	Tide	Oberon	Grand Total
1971	1	1	2				1	5
Hobart		1						1
Melbourne	1							1
Onslow							1	1
Torrens			1					1
Yarra			1					1
1972	1	2				1		4
Brisbane		1						1
Melbourne	1							1
Perth		1						1
Supply						1		1
1973	1	1	1					3
Brisbane		1						1
Melbourne	1							1
Stuart			1					1
1975	1	1	1				1	4
Hobart		1						1
Melbourne	1							1
Otway							1	1
Parramatta			1					1
1977	1	2	1			1	2	7
Brisbane		1						1
Melbourne	1							1
Otway							1	1
Ovens							1	1
Parramatta			1					1
Perth		1						1
Supply						1		1
1978	1	1	1			1	2	6
Melbourne	1							1
Onslow							1	1
Ovens							1	1
Perth		1						1
Supply						1		1
Torrens			1					1
1980	1	2	1			1	1	6
Brisbane		1						1
Hobart		1						1

Year & Participant	Majestic	Adams	River	Perry	Durance	Tide	Oberon	Grand Total
Melbourne[43]	1							1
Otama							1	1
Supply						1		1
Yarra			1					1
1982		2	2				2	6
Brisbane		1						1
Hobart		1						1
Onslow							1	1
Otway							1	1
Swan			1					1
Yarra			1					1
1984			1	1		1	2	5
Adelaide				1				1
Ovens							1	1
Oxley							1	1
Parramatta			1					1
Supply						1		1
1986				2				2
Darwin				1				1
Sydney				1				1
1988		1	1	2	1		1	6
Canberra				1				1
Darwin				1				1
Hobart		1						1
Otama							1	1
Parramatta			1					1
Success					1			1
1990		1		2	1		1	5
Adelaide				1				1
Brisbane		1						1
Darwin				1				1
Otway							1	1
Success					1			1
1992		1		2	1		1	5
Adelaide				1				1
Canberra				1				1
Hobart		1						1
Otway							1	1
Success					1			1

[43] This was the last time *Melbourne* participated in RIMPAC

Year & Participant	Majestic	Adams	River	Perry	Durance	Tide	Oberon	Grand Total
1994		1		2	1			4
Darwin				1				1
Hobart		1						1
Success					1			1
Sydney				1				1
1996		1	2	3	1		2	9
Melbourne[44]				1				1
Newcastle				1				1
Onslow							1	1
Orion							1	1
Perth		1						1
Success					1			1
Swan			1					1
Sydney				1				1
Torrens			1					1
1998		2		2	1		1	6
Brisbane		1						1
Darwin				1				1
Melbourne				1				1
Onslow							1	1
Perth[45]		1						1
Success					1			1
Grand Total	**7**	**19**	**13**	**16**	**6**	**5**	**17**	**83**

[44] FFG *Melbourne*

[45] *Perth* and *Brisbane* were the last DDGs to participate

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Appendix L Terms and Abbreviations – Comprehensive List

The following terms and abbreviations have been used in this thesis.

Term	Meaning
1st SL	First Sea Lord (RN)
3NM	Third Naval Member (Australian Naval Board)
4.5"	Four point five inch calibre gun fitted to RN and RAN ships
5"/54	Five inch 54 calibre gun fitted to the Adams Class
A/S	Anti-Submarine
A4	McDonald Douglas Skyhawk aircraft
AAW	Anti Air Warfare
ABR	Australian Book of Reference
AC	Companion of the Order of Australia
ACDEV	Assistant Chief of Defence Force (Development)
ACDS	Advanced Combat Direction System (USN)
ACNB	Australian Commonwealth Naval Board
AD	Destroyer Tender
ADACS	Australian Distributed Architecture Combat System (RAN FFG)
Adams Class	Charles F. Adams Class of destroyers (USN & RAN)
ADAWS	Action Data Automated Weapon System (RN)
ADF	Australian Defence Force
Admiral	A four star rank naval officer
Aegis	Current generation (2016) USN combat system combining phased array radars, command and control and guided missile capabilities
AEW&C	Airborne Early Warning and Control (aircraft operated by the RAAF)
AIC	Air Intercept Controller
AINS	Acceptance Into Naval Service
AIO	Action Information Organisation
AIOTT	Action Information Tactical Trainer
AITC	Action Information Training Centre (HMAS WATSON)
AM	Member of the Order of Australia
AN/OJ-194	NCDS user console used for presentation of radar video, electronic symbols and communications
AN/SLQ-32	Electronic Warfare support equipment
AN/SPG-51	Fire control radar for Tartar and Standard missile system
AN/SPG-55	Fire control radar for the Terrier missile system
AN/SPS-10	Medium range surface search and navigation radar
AN/SPS-39	Three dimensional radar with mechanical rotation and electronic scan in elevation (replaced by SPS-52)
AN/SPS-40	Long range air warning two dimensional radar
AN/SPS-48	Three dimensional surveillance radar with mechanical rotation and electronic scan in elevation
AN/SPS-49	Long range air warning two dimensional radar

Term	Meaning
AN/SPS-52	Three dimensional radar with mechanical rotation and electronic scan in elevation (Used in association with Tartar/Standard Missile)
AN/SPS-67	Medium range surface search and navigation radar (replacement for SPS-10)
AN/SQS-23	Medium range low frequency sonar (fitted to the Adams Class)
AN/SYS-1	Automatic radar tracking system with multiple radar inputs
AN/SYS-2	Automatic radar tracking system with multiple radar inputs (not adopted by RAN)
AN/ULQ-6	Electronic countermeasure and fire control decoy system fitted to the Adams Class
AN/USQ-20	Early USN NTDS digital computer - initially proposed for the Adams Class
AN/UYA-4	NCDS/JPTDS display system
AN/UYK-20	USN standard mini-computer used in Perry FFG and Adams DDG
AN/UYK-7	USN standard computer for the first RAN NCDS conversion
AN/WLR-1	Electronic emission detection system (ESM) (fitted to the Adams Class)
AN/WLR-1H	Electronic emission detection system (ESM) (fitted to the Adams Class)
ANRUK	Australian Representative United Kingdom
Anzac Class	Anzac Class of Frigates (RAN & RNZN)
ANZAM	Australian New Zealand and Malaya (Defence Agreement)
ANZUS	Australia New Zealand United States Defence Treaty
AO	Officer of the Order of Australia
AO	Auxiliary - Oiler (Tanker)
AOE	Auxiliary - Oiler and Explosives
Arleigh Burke Class	USN Aegis equipped guided missile destroyer
AS-1	Soviet air to surface anti-ship missile (Kennel)
AS-4	Soviet air to surface anti-ship missile (Kitchen)
ASM	Anti-Ship Missile
ASMD	Anti-Ship Missile Defence
ASROC	Anti-Submarine Rocket (fitted to USN Adams Class)
ASW	Anti-Submarine Warfare
ASWO	Anti-Submarine Warfare Officer
AUSDESRON 1	First Australian Destroyer Squadron
AWD	Air Warfare Destroyer (the Hobart Class to be operated by the RAN)
AWM	Australian War Memorial
Battle Class	Battle Class Destroyers
Beagle	NATO code name for Ilyushin IL-28 bomber
Belknap Class	Terrier equipped USN large destroyer - first ships fitted with NTDS
BR	Book of Reference (RN)
Brakemine	RN project for development of surface to air guided missile

Term	Meaning
Brooke Class	USN ASW frigate fitted with a single channel Tartar system - similar to the Garcia Class
Bumblebee	USN project for development of surface to air guided missiles
BuShips	Bureau of Ships (USN)
BVP	Beacon Video Processor (NTDS/NCDS)
CA	Cruiser
Captain	A naval officer of Captain rank
CBE	Commander of the British Empire
CDF	Chief of the Defence Force
CDFS	Chief of the Defence Force Staff
CDS	Comprehensive Display System (RN)
CDSC	Combat Data Systems Centre (Canberra)
CEC	Cooperative Engagement Capability (Networking of ship, aircraft and other sensors and missiles for target engagement)
C-I-C	Combat Information Centre (USN) A compartment from where operations of the ship are controlled from
CIWS	Close In Weapon System
CLSA	Cooperative Logistics Support Arrangements
CN	Chief of Navy (RAN)
CNM	Chief of Naval Materiel
CNO	Chief of Naval Operations (USN)
CNORP	Chief of Naval Operations Requirements and Plans
CNP	Chief of Naval Personnel
CNS	Chief of Naval Staff (RAN)
CNSAC	Chief of Navy Advisory Committee (previously Chief of Naval Staff Advisory Committee) - successor to the Naval Board
CNTS	Chief of Naval Technical Services
Collins Class	Collins Class Submarines
COMFLOT	Commodore Flotilla's
COMINT	Communications Intelligence
Command	Commanding Officer
Commander	A naval officer of Commander rank
Commodore	A one star rank naval officer
COSC	Chiefs of Staff Committee (became Chiefs of Service Committee)
County Class	County Class of destroyers (RN) Also known as Hampshire Class
CPO	Chief Petty Officer
CSC	Conspicuous Service Cross
CSE	Combat System Evaluation
CSO-E	Chief Staff Officer - Engineering
CSTOR	Combat System Tactical Operational Requirement
CTF	Commander Task Force
CTG	Commander Task Group
CTU	Commander Task Unit
CV	Aircraft Carrier

Term	Meaning
DAMR	Director of Aircraft Maintenance and Repair Division
DAO	Defence Acquisition Organisation
Daring Class	Class of destroyers constructed for service in both the RN and RAN, but RAN ships were modified for Australian conditions
DAWOT	Director of Air Warfare Organization and Training Division
DCNS	Deputy Chief of Naval Staff
DCP	Defence Capability Plan
DD	Destroyer
DDG	Guided Missile Destroyer
DDG Qualified	An officer who held the position of Head of Department or Commanding Officer of a DDG
DDG-2	Charles F Adams Class Guided Missile Destroyer
DDL	Light Destroyer (A project to replace the RAN Darings Approved and then cancelled and replaced by FFG Project (Perry Class))
DE	Destroyer Escort
DEG	Guided missile equipped Destroyer Escort
DER	Defence Efficiency Review (1997)
DERP	Defence Efficiency Reform Program (followed from DER)
DI (N)	Defence Instruction (Navy)
Direction Officer	Seaman Officer with responsibilities for air direction and the action information organisation sub department of the Seaman Department
DMEO	Deputy Marine Engineering Officer
DSC	Distinguished Service Cross (British and Commonwealth)
DSDC	Defence Source Definition Committee
DSO	Deputy Supply Officer - Assistant to the Supply Officer
DSO	Distinguished Service Order (British and Commonwealth)
DSTO	Defence Science and Technology Organisation
DTSR	Director of Tactics and Staff Requirements
EDP	Electronic Data Processing
ELINT	Electronic Intelligence
ESM	Electronic Support Measures (normally passive detection of electronic emissions)
Essex Class	WWII medium size aircraft carrier (USN)
ESSM	Evolved Sea Sparrow Missile
Evaluator	The Seaman Officer controlling the DDG operations room and fighting the ship on behalf of the Commanding Officer This term was made redundant with adoption by the RAN of the PWO fighting doctrine
EW	Electronic Warfare
Executive Officer	Seaman Officer Second in command and Head of the Seaman Department in a warship
F-111	US origin swing wing fighter bomber operated by the RAAF
FAA	Fleet Air Arm
Farragut Class	USN Guided Missile Destroyer fitted with the Terrier missile

Term	Meaning
	system
FBP	Final Battle Problem
FCSC	Fire Control Systems Coordinator - coordinates the engagement of air targets by the missile and gun system of a DDG
FF	Frigate
FFG	Guided Missile Frigate
Fleet Commander	Commander Australian Fleet
FMS	Foreign Military Sales
FOCEA	Flag Officer in Command East Australian Area
FOD	Follow on Destroyer Project (Became two Perry Class FFG constructed in Australia)
FOF2	Flag Officer Second Flotilla (RN)
Forrest Sherman Class	Early post WWII USN destroyer
FTG	Fleet Training Group
Gannet	UK carrier borne ASW aircraft operated by the RN and RAN
Garcia Class	USN ASW frigate
Gearing Class	USN WWII class of destroyer
GID	Garden Island Dockyard (Sydney)
GL	General List of officers
GM	Guided Missile Ships
GMLS 13	Guided Missile Launcher System - fitted to DDG and FFG - from which Tartar, then Standard missiles, and also Harpoon missiles could be launched
GOA	Government of Australia
GT	General Purpose (Training)
Gunnery Officer	Seaman Officer with responsibilities for Gunnery and associated sub-department of the Seaman Department
Hampshire Class	RN guided missile destroyer - also known as County Class
Harpoon	US anti-ship capable missile Capable of being launched from ships, submarines and aircraft
Head of Department	Head of a Department of a warship
HF	High Frequency radio communications
HICAPCOM	High Capacity Communications system (USN)
HOD	Head of Department - head of one of the primary departments of a warship - responsible to the Commanding Officer
ICKCMX	Integrated Circuit Keyset Central Multiplexer (NCDS)
IFF	Identification Friend or Foe
Ikara	Australian designed and built long range ASW guided missile system
ILLAROO	Planned, but not implemented, upgrade to the Ikara ASW system
Ilyushin	Soviet Union medium range jet tactical bomber
INSERV	Board of Inspection and Survey (USN)
INTERFET	International Force East Timor
ITR	Improved Tartar

Term	Meaning
LT (JG)	Lieutenant Junior Grade (USN)
JOTS	Joint Operational Tactical System
JPTDS	Junior Participating Tactical Data System The RAN NCDS was developed from this system
JTIDS	Joint Tactical Information Distribution System
Kennel	NATO code name Soviet air to surface anti-ship missile (also AS-2)
Kitchen	Soviet air to surface anti-ship missile (AS-4)
Komar Class	Soviet Union fast missile armed patrol boat
LCDR	Lieutenant Commander
LCH	Landing Craft Heavy
Leander Class	Frigate of the Royal Navy
LEUT	Lieutenant (Navy)
Lieutenant	A naval officer of Lieutenant rank
Lieutenant Commander	A naval officer of Lieutenant Commander rank
Link 11	Digital data link for the exchange of tactical data via a communications system
Link 16	Digital data link for the exchange of tactical data via a communications system
LOA	Letter of Offer and Acceptance
LPA	Landing Platform Amphibious
LSH	Landing Ship - Heavy
LST	Landing Ship Tank
LVO	Royal Victorian Order - Lieutenant (British and Commonwealth)
LWO	LWO-2 (long range 2 dimensional air search radar)
Majestic Class	Modified Majestic Class Aircraft Carrier (built in UK)
MAS	Military Assistance (US)
MEO	Marine Engineering Officer - The 'MEO' - the Head of the Marine Engineering Department of the warship
Midshipman	A naval officer of Midshipman rank
Mirage	French Dassault Mirage jet fighter (operated by RAAF)
Mk44	A homing torpedo designed to attack submarines
Mk46	A homing torpedo designed to attack submarines
NAA	National Archives of Australia
NARA	National Archives and Records Administration (United States)
Navigating Officer	Seaman officer with responsibilities for the safe navigation of the ship
NC-2	Mechanical plotting table with a light projection and compass graticule representing the position of the ship
NCDS	Naval Combat Data System
NCSS	Naval Command Support System - a shore based all-source computerised intelligence system used for the support of maritime operations The Australian system was a derivative of the USN OSIS
NOFORN	Not Releasable to Foreign Nationals (United States)

Term	Meaning
NSD	Naval Supply Depot (USN)
NTDS	Naval Tactical Data System
NTU	New Threat Upgrade
NWSA	Naval Warfare Systems Agency (Successor to CDSC)
Oberon Class	Oberon Class Submarines
OBU	OSIS Baseline Upgrade (major upgrade to OSIS)
Oliver Hazard Perry Class	Guided Missile Frigate (USN & RAN)
OPEVAL	Operational Evaluation (a component of OT&E)
OpNav	Office of Chief of Naval Operations (USN)
ORDALT	Ordinance Alteration (USN)
ORE	Operational Readiness Evaluation
OSIS	Operational Support Intelligence System (USN shore based intelligence system purchased by the RAN)
PACOM	Pacific Command (United States)
Perry Class	Oliver Hazard Perry Class Frigates
Phalanx	Close in Weapon System
PWO	Principal Warfare Officer - the Seaman Officer controlling the operations room and fighting the ship on behalf of the Commanding Officer
QR	a computer controlled process for recognising and selecting the highest priority targets for engagement
QR & AI	Queens Regulations and Admiralty Instructions
RAAF	Royal Australian Air Force
Radar	Common word meaning Radio Detection and Ranging
RADM	Rear Admiral (2 Star)
RAN	Royal Australian Navy
RANC	Royal Australian Naval College
RANTAU	RAN Trials and Assessing Unit
RANTEWSS	RAN Tactical Electronic Warfare Support Section
RAS	Replenishment at Sea (RN Term)
RATSTRUC	Rating Structure and Advancement Committee (1964)
Rear Admiral	A two star rank naval officer
RI	Regulations and Instructions for the RAN (ABR 5016)
RIMPAC	Rim of the Pacific (International Naval exercise)
River Class	Class of RAN frigates constructed primarily as ASW platforms Also known as DE
RN	Royal Navy
RNZN	Royal New Zealand Navy
ROP	Report of Proceedings
RUSI	Royal United Services Organisation
RVP	Radar Video Processor
S2E	Grumman Tracker ASW aircraft
Sabre	US jet fighter (operated by RAAF)
Sacramento Class	USN Combined Oiler, Ammunition and Stores support ship

Term	Meaning
SAGW	Surface to Air Guided Weapon (sometimes S.A.G.W.)
SAILSTRUC	Sailor Structure Review (1970)
SCB	Ship Characteristics Board (USN)
Scimitar	RN Carrier borne jet fighter aircraft
SCO	Signals Communications Officer Seaman Officer with responsibilities for the ships Signals Communications sub department of the Seaman Department Normally also responsible for the Electronic Warfare capabilities of the ship
SD	Special Duties list of officers (officers who were previously sailors)
Sea Cat	Short Range Surface to Air Guided Missile (RN)
Sea Dart	Medium to Extended Surface to Air Guided Missile (RN)
Sea King	Medium lift helicopter
Sea Slug	Medium Range Surface to Air Guided Missile (RN)
Sea Venom	Carrier borne jet fighter (operated by RAN & RN)
SEATO	South East Asian Treaty Organisation
SERVMART	Service Market Store (USN)
Skory Class	Destroyer type warship of the Soviet Union
Skyhawk	A4 fighter bomber
SM-1	Standard Missile Version 1
SM-2	Standard Missile Version 2
SM-6	Standard Missile Version 6
SOAP	Supply Operations Assistance Program
Sonar	Common word meaning Sound Navigation and Ranging
SPC-A	Sea Power Centre - Australia
SQAT	Ship Qualification and Acceptance Trials (sometimes SQT)
SQT	Ship Qualification and Acceptance Trials (Sometimes SQAT)
SSG	Guided Missile Submarine (conventionally powered)
Standard Missile	The USN Standard missile family
Styx	Soviet origin surface to surface anti-ship missile
Sub Lieutenant	A naval officer of Sub Lieutenant rank
Sumner Class	USN WWII class of destroyer
Supply Officer	Supply Officer - an officer responsible for the victualling, cash, stores and administrative support of a warship 'The Supply Officer' - Head of the Supply Department
Surface Combatant	A collective term that includes both frigate and destroyer types of warship
Sverdlov Class	Soviet Union Cruiser
SWC	Ship's Weapon Coordinator - Seaman Officer who coordinates the management of the above warfare sensors, elements of NCDS and the weapons of a DDG
SWSC	Submarine Weapons Systems Centre
SWUP	Submarine Weapon Systems Upgrade Program
Talos	Long Range Surface to Air Guided Missile (USN)
Tartar	Medium Range Surface to Air Guided Missile (USN)

Term	Meaning
TAS Officer	Torpedo and Anti-Submarine Officer A Seaman Officer with responsibilities for the operational performance of the under-water warfare capabilities of the ship
TBP	Training Battle Problem
TCSPT	Total Combat System Proving Trials
TEMP	Test and Evaluation Master Plan
Terrier	Medium to Extended Range Surface to Air Guided Missile (USN)
Ticonderoga Class	USN Aegis equipped guided missile cruiser
TIDE	Tactical International Data Exchange (precursor to Link 11)
Tide Class	Fleet Oiler
Ton Class	Minesweepers and Minehunters
TTB	Tactical Trainer Building (HMAS WATSON)
TTP 92	Technical Training Plan 1992
Type 184	Medium range sonar (RN)
Type 199	Variable depth sonar (RN)
UHF	Ultra-High Frequency (Radio spectrum)
UK	United Kingdom
UN	United Nations
UNREP	Underway Replenishment (USN Term)
URDEF	Urgent Defect - a method of assigning priorities to assistance required to repair defective equipment affecting operational performance requirements
US	United States
USA	United States of America
USAF	United States Air Force
USN	United States Navy
USNHHC	United States Navy History and Heritage Command
VCDF	Vice Chief of the Defence Force (3 Star) - deputy to the Chief of the Australian Defence Force
VDS	Variable depth sonar
VERTREP	Helicopter transfer of stores using underslung carrying equipment
Vice Admiral	A three star rank naval officer
VLF	Very Low Frequency radio communications (used primarily to communicate with submerged submarines)
VLS	Vertical Launch System (for launch of missiles)
VOA	Voice of America
WEEO	Weapons Electrical Engineering Officer - 'The WEEO' - the Head of the Weapons Electrical Department of a warship. Also a qualification.
Wessex 31B	Westland Wessex Helicopter
Whiskey Class	Soviet Union conventional submarine
WRANS	Women's Royal Australian Naval Service
WWII	Second World War
XO	Executive Officer - second in command