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# headmark

DECEMBER 2008

*THE MOST CAPABLE WARSHIPS  
IN THE NAVY'S HISTORY SET TO  
JOIN THE FLEET*

**INFORMATION OPERATIONS  
MANAGEMENT IN THE RAN**

*THE VERNON PARKER ORATION 2008  
THE NAVY & THE WHITE PAPER*

**A CAUTIONARY TALE – FAILURES OF  
JAPANESE AIR POWER IN WWII AND  
LESSONS FOR AUSTRALIAN MARITIME  
AIR EXPANSION**

**FINDING THE LOST SUBMARINE:  
*THE MYSTERY OF AE1***

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# President's Message

2008 has been an extremely busy and, in my mind, successful year for the ANI. We have conducted a number of very well attended events including the Vernon Parker Oration, the ANI Warfare Seminar and the Sea patrol Cast visit to ADFA.

We have seen membership rise by its highest annual rate this decade, much of that due to our focus on engaging younger members through our efforts at ADFA and through the two new essay competitions named after Commodores Harry Adams (essay competition for Midshipmen and Sub Lieutenants) and Alan 'Rocker' Robertson (for Lieutenants). These competitions have lifted the ANI's profile and have re-affirmed that our younger officers have much to contribute to the maritime debate that we strive so hard to stimulate. Hopefully you will read a good cross section of essays from these competitions over the next 12 months in *Headmark* – I would encourage you to join the debate through either letters to the editor or through your own contribution.

There was no doubt that this year's Vernon Parker Oration was a real treat for those who were lucky enough to be there. In this edition we have reproduced the address given by Professor the Honourable Kim Beazley. He remains a most thoughtful strategic commentator and his words were timely in this a White Paper year. Over 100 people attended this year's oration and over 65 stayed on for the annual dinner – a very successful evening. I am pleased to report that Rear Admiral James Goldrick, AM, CSC, RAN was awarded Honorary Life membership of the Institute at the annual dinner. James is of course no stranger to any of us in

the Institute and his active involvement over the last 30 years at all levels was truly worthy of recognition with the ANI's highest honour.

For the second year we hosted the ANI Warfare Seminar at *HMAS Watson* which was followed by a reception. It was good to see the support of the event from the Naval Warfare Officers Association and the Naval Officers' Club. The sixty guests were given a range of presentations from Senior serving officers on a range of issues that the RAN is grappling with. There is no doubt that the Warfare Seminar has established itself as a key event in the ANI calendar.

I would like to thank the members of your Council for their efforts this year. Council has been active in implementing a work programme to ensure that the key elements of the ANI Strategic Plan are put in place. I am pleased to see an improved focus on governance and the development of useful set of governance metrics which I will expose to you at the next AGM early next year. I would like to thank Ernie Power for his continuing work on the website and Tom Lewis for getting the *Journal* together each quarter and keeping up to the quality we have come to expect. As always I need to mention our business manager Jean Davitt for her unstinting support.

My aim for next year is to maintain the momentum we have built this year through our improved membership numbers, our busy events calendar and hopefully a vigorous maritime debate. I hope that all our members have a peaceful and restful Christmas break.

*Yours Aye,  
Davyd Thomas*

# Contents

*The most capable warships in the Navy's history set to join the Fleet* 4

*Information Operations Management in the RAN* 15

*The Vernon Parker Oration 2008  
The Navy & the White Paper* 19

*A Cautionary Tale – Failures of Japanese Air Power In WWII and Lessons for Australian Maritime Air Expansion* 25

*Finding The Lost Submarine: The Mystery of AE1* 34

*Visions from the Vault* 43

*Book Reviews* 45

*Style Notes for Headmark* 48

*ANI Online Guide* 49

*Australian Naval Institute Info* 50

*ANI Membership Application Form* 51

*Front page:  
HMAS Ballarat in  
Milford Sound.*

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# THE MOST CAPABLE WARSHIPS IN THE NAVY'S HISTORY SET TO JOIN THE FLEET

BY LEE CORDNER

The most capable warships in the history of the Royal Australian Navy (RAN) will soon be in service. But how can that be with the first of the *Hobart* Class Air Warfare Destroyers (AWD) more than five years away? Fortunately, the Navy and the Nation will not have to wait that long before four very capable surface combatants are again operational in the Fleet. The upgraded *Adelaide* Class FFGs are planned to re-enter service as fully operational front-line warships over the next 12–18 months. They will bring what will in some respects be an advanced level of combat capability unprecedented in the RAN. This article analyses the Upgraded FFG, the capabilities that it brings and the challenges and opportunities it presents for the Navy and the Australian Defence Force (ADF).

No analysis of the Upgraded FFG would be complete without first briefly reviewing the policy context that resulted in a decision to proceed with an upgrade, and the FFG Upgrade Project experience. Like most major Defence projects the FFG Upgrade Project (Project SEA 1390)<sup>1</sup> had a long gestation period. Although the project is a capability upgrade to an existing platform rather than a new build, the time taken from concept to the capability being fully operational will be more than 15 years. The FFG Upgrade Project has drawn attention to many Defence policy and project management issues that will briefly be considered here. Whilst project, contractual and audit difficulties have been aired in parliamentary committees and the media, the capability gains and advantages for the total Naval force have not been as well understood. This article seeks to enhance that understanding.



*HMAS Sydney in homeport  
– note the Mk 41 VLS*

## DEFENCE POLICY AND THE FFG UPGRADE

The FFG Upgrade Project reflects the outcomes of evolving, indecisive Australian Defence policy making and relatively low levels of national investment in Defence<sup>2</sup> that have marked the Australian experience over several decades.<sup>3</sup> This has impacted negatively on the development of the surface combatant force along with other areas of Defence capability. Procrastination followed by time and cost overruns has largely been the characteristics of Defence procurement; characteristics that are in many respects reflected in the FFG Upgrade Project experience.

In the 1987 Defence white paper the Government announced that the Navy would be expanded "...to a force operating 16 to 17 major surface combatants".<sup>4</sup> The 1991 *Force Structure Review* (FSR 91) recognised that the surface combatant force was declining in numbers (it was then down to 10 ships) and indicated a planning intention to replace the DDGs with "an *Anzac* derivative" to "maintain the continuity of Australian shipbuilding, to achieve commonality ... and to

build the number up to 16" with the suggestion that "*Anzac* derivatives could also replace the first four FFGs".<sup>5</sup>

Prophetically, FSR 91 went on to state: "the ADF has for some time followed a program of mid-life modernisations of the destroyer force ... (which) without exception, have been lengthy. Reduced operational availability, together with considerable capital expenditure, have been the consequences of these programs. The concept of mid-life modernisations is not cost effective, and will not continue."<sup>6</sup> When FSR 91 was presented the DDG Modernisation project was still underway, with prospects of a limited return on investment for those ships.

Notably in this context, the *Anzac* Class frigates were replacements for the *River* Class destroyer escorts; very much at the low end of the ADF major surface combatant range of capabilities. The chosen Meko 200 base design would be unlikely to provide the space and weight necessary for the significant capability enhancements required to replace the FFGs (and the DDGs). In particular, evolving air warfare (including Aegis phased array radar derivatives and long-range vertical launch air warfare missiles) plus helicopter support capabilities and potentially unmanned aerial vehicles (UAVs) in the future (the *Anzac* has only one hanger) would be beyond that which a Meko 200 platform could reasonably support.

Notwithstanding the FSR 91 pronouncement, due to concerns about platform and system supportability, the FFG Upgrade Project was initiated in 1993. A Surface Combatant Force Study during 1993-96 concluded that given evolving anti-ship missile (ASM) and other threats, the FFGs



FFG and side number	Launched	Commissioned	Original Life	Upgraded Life
HMAS Adelaide - 01	June 1978	November 1980	2008	Withdrawn from service Jan 08
HMAS Canberra - 02	December 1978	March 1981	2008	Withdrawn from service Nov 05
HMAS Sydney - 03	September 1980	January 1983	2010	2015
HMAS Darwin - 04	March 1982	July 1984	2012	2017
HMAS Melbourne - 05	May 1989	February 1992	2019	2019
HMAS Newcastle - 06	February 1992	December 1993	2021	2021

**Royal Australian Navy - FFG Fleet Schedule Summary<sup>14</sup>**

also required an increase in capability; particularly improved self defence.<sup>7</sup> A request for proposal (RFP) was released to industry in 1994 which led to a request for tender (RFT) in 1997.

By 1997 defence policy statements indicated that 14 major surface combatants were considered an adequate number and the intention to substantially invest in “ASM defences and other upgrades for the FFGs and *Anzacs*” was declared.<sup>8</sup> By this time the three DDGs were approaching their end of life and were to be retired from service without replacement, significantly reducing the Navy’s air warfare (AW) capability.

The question of surface combatant numbers was left unanswered in the 2000 Defence White Paper other than the (six) FFGs were to be replaced

by “at least three air-defence capable ships.”<sup>9</sup> Upgrades to the FFGs plus the *Anzacs* were also identified to occur.<sup>10</sup> In 2007 Government policy recognised that “Our Navy must be able to establish sea control and operate freely within our region, while denying such freedoms to an opponent.”<sup>11</sup> Given the vast maritime geography and dependence upon the maritime domain for economic, environmental and territorial security for Australia and its region this bold defence policy assertion appears entirely justified. Concomitantly, this policy statement raises reasonable expectations that Australia would seek to acquire a significant surface combatant fleet to operate in collaboration with submarines and land-based air forces. While the acquisition of three AWDs and upgrades to the *Anzac* and *Adelaide* Class frigates were mentioned, no mention was made of surface combatant numbers or acquisitions beyond the AWDs.<sup>12</sup>

The ADF currently has 12 major surface combatants (eight *Anzac* Class and four FFGs). The *Anzacs* are shouldering the operational burden which includes ongoing commitments in the Persian Gulf<sup>13</sup> while the FFGs are being upgraded. There is some overlap between when the AWDs are planned to enter service during the period 2014-2017 and when the remaining FFGs are planned to be retired between 2015 and 2021, noting that there will typically be a considerable trials and acceptance period beyond 2014 until the first AWD will be fully operational. The table above outlines the FFG

planned life of type schedule.

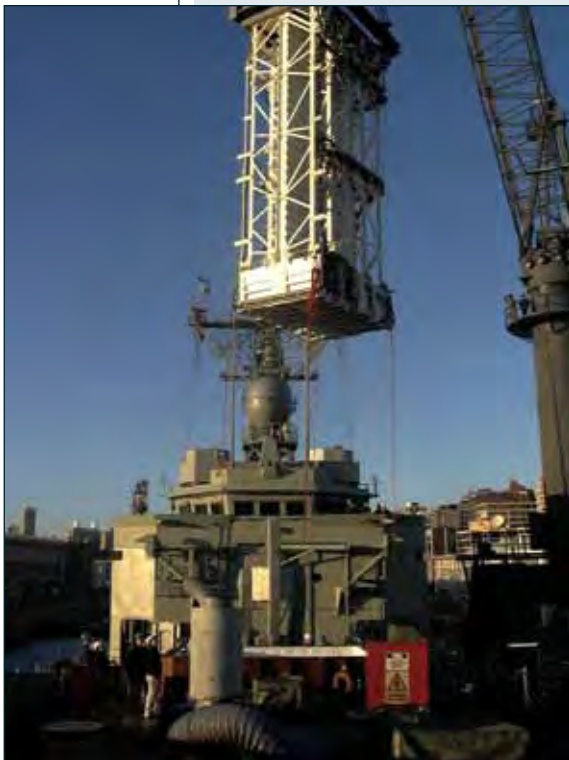
**THE FFG UPGRADE PROJECT**

The FFG Upgrade Project began in earnest when the RFT was released which led to ADI Ltd being selected as the prime contractor in 1998. The contract to proceed was signed in 1999. The initial plan was for all six FFGs to be upgraded and the Project includes the procurement of six ship sets of equipment plus an FFG Warfare Systems Support Centre (WSSC), a Combat Team Trainer and three Operator Trainers.

The FFG Upgrade Project is more an end of life than a mid-life modernisation. The prolonged concept to upgrade timeline with attendant project delays meant that the cost effectiveness of upgrading the older ships could not be justified. In late 2003 the Government determined that *Canberra* and *Adelaide* would not be upgraded. They have since been withdrawn from service.

The Project has proven to be challenging and extremely complex.<sup>15</sup> The FFG Upgrade is one of the most sophisticated and extensive enhancements ever undertaken of a modern surface combatant. It involves major weapon, sensor, combat, and command and control systems upgrades along with significant platform supportability work. The system integration work is in some respects unique in the world with the challenge of combining legacy systems from the original FFG configuration (1970s technology) with more advanced technologies drawn from a range of international sources. In addition to the upgrade specific activities many platform deficiencies and deep maintenance issues also had to be rectified to ensure a planned 35 year hull life could be achieved. Effectively this required the ships to undergo major refits concurrent with

**Mk 41 VLS being embarked**



## THE MOST CAPABLE WARSHIPS IN THE NAVY'S HISTORY SET TO JOIN THE FLEET

the upgrade.

The complexity of the Project and its implementation was no doubt underestimated from the outset. Navy, Defence Capability Development (DCD), Defence Material Organisation (DMO) and the prime contractor, ADI Ltd now trading as Thales Australia Ltd have been party to what became an ongoing series of schedule slippages to the extent that the Project is now four and half years late (i.e. the first of the Upgraded FFGs should have been in operational service by 2004). Following an extensive negotiation between DMO and the prime contractor a Deed of Settlement and Release was signed in 2006 that presented a revised master schedule with Contract Final Acceptance due in December 2009.

The extensive delays had resulted in a project climate of frustration and disappointment for all concerned. The situation was exacerbated by a set to work and trials period plagued by systems interface and perceived performance shortcomings, with several major systems initially failing to meet acceptance criteria. The main problem areas have been underwater warfare (UW), electronic surveillance (ES) system, and the central Australian Distributed Architecture Combat System (ADACS), with Link 16 and other significant operational features being progressively incorporated. Of late, more collaborative DMO-contractor approaches with a sharper end capability focus have shown dividends, with substantial progress on rectifying problem issues and demonstration of improved performance.

There have also been highly successful and impressive results during the trials and introduction to service period. For example, during ASM defence trials involving *HMAS Sydney* on the United States Navy's fully instrumented Pacific Missile

Range Facility (PMRF) off Hawaii in October 2007 the combination of the upgraded air warfare (AW) package of improved sensors, vertical launched Enhanced Sea Sparrow Missile (ESSM) and ADACS successfully dealt with multiple, simultaneous, multi-directional live ASM attack (using realistic drone missile targets). This event included a successful live ESSM engagement. Incorporation of the 32 cell Mk 41 Vertical Launch System (VLS) into the FFG hull is a considerable naval architectural design feat which helps fulfil one of the key requirements for effective ASM defence in the Upgraded FFG. The ADACS combat system has been developed in Australia and is unique to the Upgraded FFGs.

Given the operational environment of the Navy's ongoing Middle East commitment a fully functioning, integrated ES capability has been identified as the highest priority outstanding requirement to support acceptance and deployment by the Navy. Navy has understandably taken a firm stand in demanding that the Project demonstrate fully functional operational capabilities. In early 2008 DMO, with strong support from and direct involvement of The Hon. Greg Combet, Parliamentary Secretary for Defence Procurement,<sup>16</sup> established an FFG ES Stakeholders Group. This group includes representatives from all the major players including Navy, DMO, Thales and Rafael (the subcontractor for the C-Pearl system).

A number of significant people and perception casualties have resulted from the extensive Project delays and the failure of some systems to achieve satisfactory results during initial acceptance trials. Within Navy the FFG Upgrade Project and the Upgraded FFG has become known as a "lemon". Some FFG officers and sailors appear to have lost confidence in the ships



*Sydney launches an ESSM*

and the improved capabilities the upgrade offers. These internal to Navy perceptions will be difficult to rectify as the challenges are progressively addressed and fully operational, high performing systems are accepted into service. Further, the incoming Labor Government has rightly put Defence on notice about poor project performance.<sup>17</sup> No doubt the FFG Upgrade Project stands out as one of several troubled projects. The media, both nationally and internationally has understandably been critical of the project<sup>18</sup> and this in turn impacts on morale among people in the FFG Fleet.

There are parallels here with the situation that obtained when the *Collins* Class submarines were encountering problems during introduction to service. The overall result is that Navy (and Defence) is faced with a crisis of confidence both internally and with Government, and this has significant implications for national security. The situation must be resolved satisfactorily and expeditiously.

Considerable progress is now being made due in no small part to a more collaborative approach to solving problems and dealing with challenges

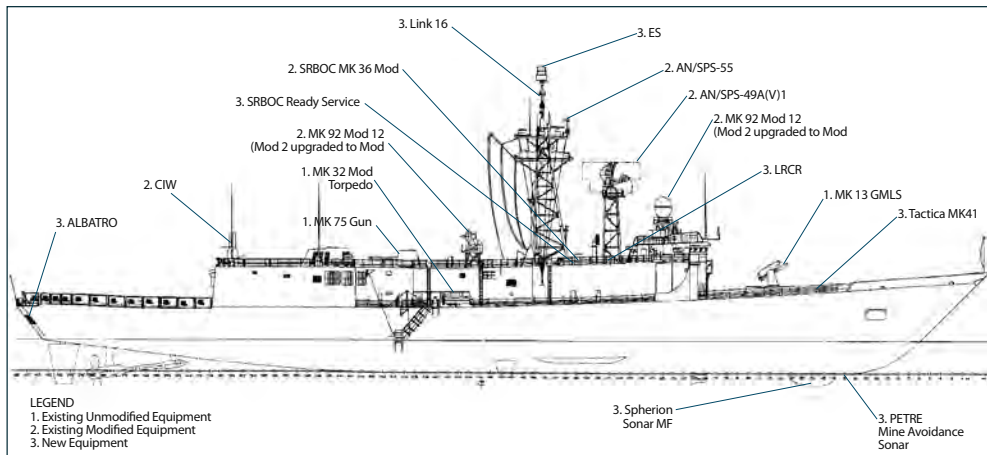


Diagram Courtesy of Thales

generated through initiatives like the FFG ES Stakeholders Group. There is now an atmosphere of cautious optimism that the Upgraded FFG will “get across the line” and highly capable warships will soon be back in operational service. A brief overview of key Project milestones achieved and planned is presented in the following table.

Date	Milestone
December 2006	Sydney Provisionally Accepted <sup>1</sup>
October 2007	Melbourne Provisionally Accepted
October 2007	Newcastle Commenced Upgrade
August 2008	Darwin Provisionally Accepted
November 2008	Sydney Acceptance <sup>2</sup> /Initial Operational Release <sup>3</sup>
November 2008	Melbourne Acceptance/Initial Operational Release
November 2008	Darwin Acceptance/Initial Operational Release
November 2008	Provisional Acceptance of WSSC
November 2008	Acceptance of Upgraded Software
February 2009	Acceptance of Team Trainer
June 2009	Newcastle Provisional Acceptance
December 2009	Newcastle Acceptance/Initial Operational Release
December 2009	Contract final acceptance – completion of the contract

**KEY FFG UPGRADE PROJECT MILESTONES<sup>19</sup>**

Many important lessons about the management of complex defence projects have been learnt (or re-learnt) during this extended and often frustrating project experience. While it is beyond the scope of this paper to identify or analyse the project lessons in any detail, some of the major lessons

include:

- ☛ Effective, comprehensive and detailed project planning is essential. Early planning shortfalls can have disproportionate downstream consequences.
- ☛ Requirements and specifications must be well defined and agreed before contract signature. The lack of clearly defined specifications for many of the FFG Upgrade Project requirements has meant that assessing contract compliance and operational performance against that specified has proven to be extremely difficult.
- ☛ Lack of expertise to define requirements and manage and implement the project has proven to be a significant and difficult matter for all parties: Navy, Defence, DMO and the prime contractor.
- ☛ Careful consideration must be given from the outset to the systems integration implications of combining legacy systems with more recent technologies.
- ☛ Conducting an upgrade of an existing capability concurrent with maintenance availability is a highly complex activity that requires careful planning and close cooperation and collaboration in execution.

The contract and schedule must be robust and achievable. There must be thorough risk appraisals and risk management processes in place particularly where significant technical, schedule and financial risks exist with a

complex project.

☛ Effective communication and the creation of a cooperative and collaborative environment between all parties, focussed upon solving problems, are essential from the outset. There must be a clear focus by all parties on the requirement to deliver a functional capability to the customer in a cost effective and timely way. The customer must be closely engaged throughout.

**THE UPGRADED FFG – CAPABILITY ANALYSIS**

As indicated in the introductory remarks, the Upgraded FFG presents a higher level of combat capability than previously available in the RAN. This may sound like a grand claim, but is backed by tangible evidence. The following analysis will draw together and assess the key elements of the FFG systems package that when fully operational and combined with a well prepared, led and motivated ship’s company, comprises an impressive naval combat capability. This analysis will look at the principal naval warfare areas in turn before drawing the total assessment together, recognising that the FFG is an integrated, multi-role weapon system where components of the platform, the weapons systems and the combat system will contribute variously to multiple warfare competencies.

**AIR WARFARE (AW)**

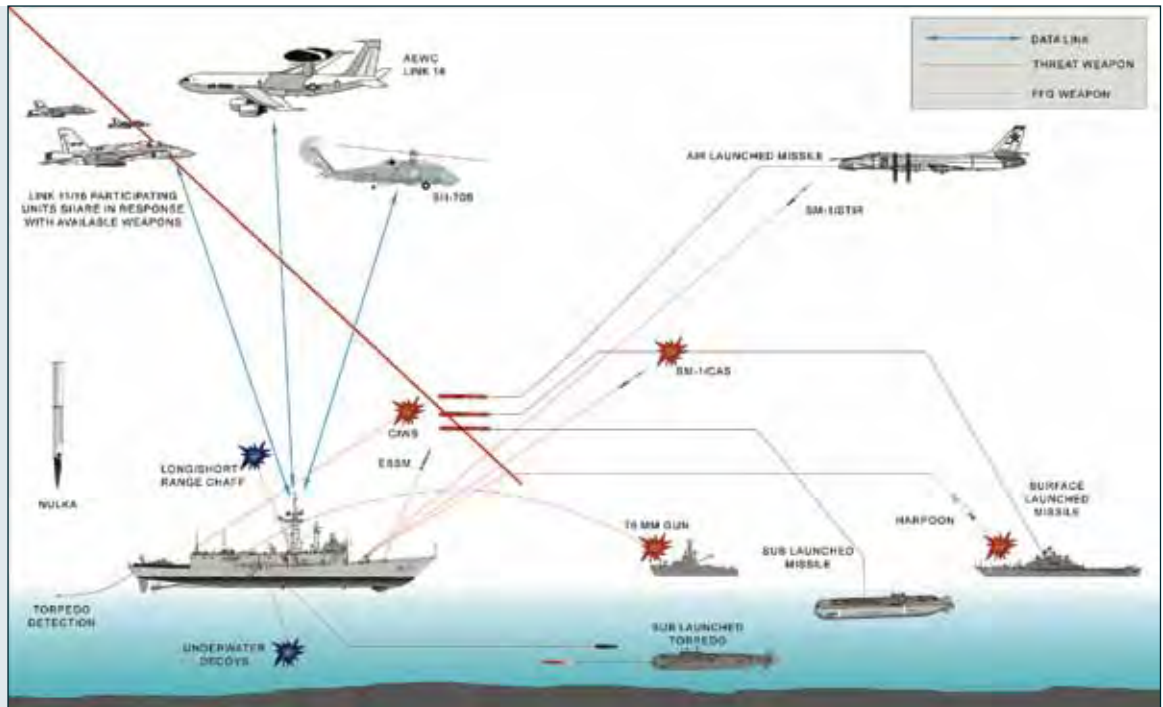
A primary aim of the FFG Upgrade Project was to improve the AW capability generally and particularly defences against new generation ASMs, including sea skimming missiles. The Upgraded FFG offers a more comprehensive and complete AW and ASM capability package than hitherto available in the RAN. A classic layered defence approach is adopted, involving hard kill and soft kill capabilities. The



## THE MOST CAPABLE WARSHIPS IN THE NAVY'S HISTORY SET TO JOIN THE FLEET

key elements of the layers are reviewed below.

The outer layer of hard kill comprises fighter aircraft, whether operated by the ADF or coalition partners, land-based or carrier borne, and combined with Airborne Warning and Control Systems (AWACS) when available, plus the surface to air missile capabilities of other RAN and allied warships that may be operating together. The



FFG's ability to effectively integrate with US and NATO forces for example, and to direct fighters is greatly enhanced with the inclusion for the first time in the RAN of Tactical Digital Information Link (TADIL) J Link 16, added to TADIL B Link 11 and using the Joint Tactical Information Distribution System (JTIDS) for data link communication. This capability effectively enables the FFG to direct the prosecution of hostile aircraft, whether missile carriers, fighter bombers or surveillance aircraft hundreds of kilometres away. An enemy's surveillance, target selection and identification problem becomes vastly complicated by imposing an extended stand-off range; and hostile aircraft can be engaged before they can launch anti-ship weapons. It also presents a much improved capacity for RAN integration with US-led coalitions.

The subsequent layers of AW capability rely primarily on ship borne sensors and weapons although these can also be cued with information from other sources like AWACS or other ships via Link 16. The air surveillance capability of the FFG has been considerably enhanced by inclusion

of an updated air surveillance radar, the AN/SPS 49A(V)1, which provides a much improved ability to detect low altitude and small radar cross section targets, and includes automatic target detection, improved reliability and other features. The operational performance of this radar has proven to be considerably better than the variant it replaced and gives high confidence in the early detection of aircraft and missile targets.

The AW fire control system has been greatly enhanced with inclusion of the Mk 92 Mod 12 system, which is a further enhancement of the Mod 6 system in service with US, Spanish and Taiwanese FFGs. The Mod 12 system includes the same coherent receiver and transmitter (CORT) of the Mod 6 variant plus improved signal processing, solid state electronics and improved reliability over the Mod 6. Mk 92 system performance is enhanced by inclusion of a new Radar Sensor Data Fusion System (SDFS), which provides a Radar Integrated Automatic Detection and Tracking (RAIDT) capability that combines data from all the ships search radars (AN/SPS 49A(V)1, Mk 92 CAS search, AN/

SPS 55 surface search radar) plus the two Mk 92 system fire control radars. The outcome is the automatic detection of targets, automatic correlation of multiple radar detections and accurate prediction of target movement to the Command team and weapons systems.

The range of the Mk 92 CAS fire control channel is more than double that of the earlier variants being now more in line with that offered by the Mk 92 STIR fire control channel. This vastly improved and automated sensor combination means that the reaction time for detect, track, decision, fire control radar acquisition, to firing a weapon at a target is greatly reduced. This enables the engagement of multiple, multi-directional and quickly manoeuvring air and missile targets at a much greater range from the FFG than was previously possible. The capability was practically demonstrated during the PMRF ESSM firings by *Sydney* mentioned earlier. The performance of the upgraded Mk 92 system is reported to be "excellent"<sup>20</sup>

The improved radar and weapon system performance is supported by a vastly improved surface to air missile capability. The GMLS 13 missile

Diagram Courtesy of  
Thales



launcher system has been retained with its potential to carry and launch up to 40 missiles. The system will be upgraded so that SM 2 Medium Range surface to air missiles can be accommodated along with the older SM 1 missiles and the latest variants of the Harpoon surface to surface missile. SM 2 missiles are reported to be entering the ADF inventory in late 2009.<sup>21</sup>

Inclusion of the SM 2 option represents a major enhancement to the Navy's AW capability with significant force multiplier implications. The SM 2 missile has a maximum range of more than 80 nautical miles (nm) (150 km) compared with the SM 1 missile maximum range of 25 nm (46 km) and the ESSM maximum range of around 10 nm (18 km). SM 2 and ESSM missiles are also reported to have much improved fusing arrangements and therefore effectiveness when engaging very low targets. This means that the surveillance, identification and targeting problem for hostile aircraft seeking to attack or direct an attack on a force at sea protected by an Australian FFG has become a whole lot harder. Previously, when friendly fighter cover was not available, a hostile aircraft could loiter with impunity, conducting surveillance and launching weapons or directing attacks from outside the FFG SM 1 missile engagement zone (MEZ) of 25 nm or the *Anzac* MEZ of 10 nm.

For the first time the RAN has a genuine ship borne surface to air missile-based area defence AW capability. This means that an FFG can offer effective cover for ships it is escorting as well as for itself; it can provide AW force protection over a significant and moving geographic area. With this capability entering the ADF inventory the circumstance that obtained during the early stages of the Australian-led, United Nations

authorised intervention in East Timor in 1999, where a USN Aegis cruiser had to be relied upon to provide effective air defence cover for the landing force, will not be necessary in the future when an RAN FFG is available.<sup>22</sup>

ESSM missiles deployed from a 32 cell Mk 41 VLS provide a highly effective third layer of hard kill ASM defence. The performance of this system, when combined with the Upgraded FFG radar and fire control package, is reported to be excellent.<sup>23</sup> The ESSM capability offers ASM defence redundancy not previously available in the FFG because the GMLS 13 launcher was potentially a single point of failure.

In addition to the missile capabilities, a fourth layer of hard kill air defence is provided by the 76 mm rapid firing gun. The gun effectiveness has been significantly enhanced by integrating the existing Electro Optical Tracking System (EOTS) 2500 with the Mk 92 system. This capability includes a laser range finder and enables an additional three dimensional gun fire control channel to be integrated with the two radar directed channels of fire. The fifth, last resort defensive layer is the Phalanx 20 mm close in weapon system (CIWS), which is now integrated with the ADACS combat system providing a remote designation capability.

The inner layers of AW capability include the Australian designed and developed Nulka offboard, active ASM decoy. Two additional Mk 137 Mod 1 decoy launchers able to deploy new Seagnat RF decoys and Pirate IR and acoustic decoys along with long range chaff rockets (for confusion) complete the soft kill ASM (and anti-torpedo) suite.

An upgraded ES system is a major component of the enhanced AW capability; critical to sending an FFG in harms way. An effective ES capability is

important for cuing hard kill weapons and soft kill measures like Nulka as well as for target identification. The AN/SLQ 32 ASM warner has been replaced with the current generation Rafael C-Pearl digital combined electronic surveillance and ASM warner system. The system covers the 0.5 – 18 GHz frequency spectrum and is fully integrated with the combat system. The system has high sensitivity and a high data rate. Significant system integration, perceived performance and human machine interface (HMI) problems have been encountered during trials, which have resulted in low confidence in the ES system among some FFG personnel. As a result of the concerted and collaborative efforts of the FFG ES Stakeholders Group numerous technical issues have been identified and resolved. The Stakeholders are working to present an operational ES system that will meet Navy's requirements consistent with the Acceptance timetable.

### **SURFACE WARFARE (SW)**

Many of the capabilities enhancements touched upon in the AW analysis are also relevant to SW. The Harpoon system has been upgraded so that the latest variants of the missile can be deployed from the GMLS 13 launcher. The SWG 1(A) Harpoon control panel has been installed in the Operations Room. Harpoon remains a very potent SW weapon with its 80 nm (150 km) range, way points, anti-counter measures and terminal attack features. A significant aspect of the SW package is the ability to employ the embarked Seahawk helicopter's surface surveillance, targeting and data link capabilities to provide over the horizon targeting (OHT) for Harpoon engagements. Other upgraded features, including the fully integrated EOTS with laser range finding for the 76 mm gun, add to a potent SW capability.

## THE MOST CAPABLE WARSHIPS IN THE NAVY'S HISTORY SET TO JOIN THE FLEET

A concerning aspect of Navy's overall SW capability not directly applicable to the FFG Upgrade but relevant to SW capability options that could be available for employment from the FFG and other RAN surface combatants is the failure of the Super Seasprite Helicopter Program. This helicopter was originally procured to be deployed from *Anzac* Class frigates and Offshore Patrol Vessels (OPVs) (the OPVs never came to fruition). ASM armed helicopters deployed from surface combatants remain a most effective weapon option against missile armed patrol boats and larger surface combatants optimised to operate in the littoral and archipelagic areas in Australia's region. While there are well founded concerns about the emergence of submarine capabilities in the region the missile armed patrol boat remains a considerable threat and the ADF continues to have a significant capability gap in effectively dealing with this threat.

### UNDERWATER WARFARE (UW)

The Upgraded FFG offers the most advanced and comprehensive surface combatant based UW capability now available in the RAN. Somewhat similar to AW, effective UW protection of surface vessels and geographic areas like approaches to ports and straits used by international shipping requires a layered defence or defence in depth approach that is asset intensive. The outer layer may include forward deployed submarines like the *Collins* Class and land-based maritime patrol aircraft (MPA) like the P3C *Orion*. The FFG retains the capability to integrate with MPA via data link and voice communications and to coordinate, control and direct wide area UW surveillance activities.

The FFGs capacity to embark and operate two S70B Seahawk helicopters presents a significant force protection

UW capability. The Seahawk employs a range of UW surveillance and localisation sensors including for example passive and active sonobuoys and high definition search radar, and can deploy anti-submarine torpedoes. The Upgraded FFG integrates information via a discrete Seahawk data link into the FFG combat system, which enables effective coordination and control of force UW efforts. The ability to embark two helicopters remains a significant asset provided by the FFG. The *Anzac* Class frigates and the new *Hobart* Class AWD can embark only one helicopter which impacts on the numbers of helicopters available in an RAN surface force to support operational rotation and redundancy. This shortcoming will be felt in the future as the FFGs retire from service.

The onboard UW package in the Upgraded FFG comprises several significant capability enhancements. The AN/SQS 56 and Mulooka hull mounted sonar's (HMS) have been replaced with the second generation Spherion medium frequency HMS that provides active and passive submarine detection capabilities. The Albatross Torpedo Detection System (TDS) towed passive array has been added. When combined with the Lescut acoustic decoys, this system offers a greatly enhanced self defence capability against torpedo attack. Information from the HMS and the towed array is fused and integrated automatically into the combat system.

Like the ES system experience, initial results from the onboard UW sensor package were disappointing. Trials conducted at the Canadian Nanoose Bay fully instrumented underwater range facility have confirmed that the sensors are performing satisfactorily and system interface problems have been identified that are being resolved. Anecdotal

reports from recent UW trials indicate that the combination of the HMS and towed array passive and active capabilities are giving impressive submarine detection results.<sup>24</sup> Also like the ES system, significant HMI issues have been identified. The passive and active data from the HMS and towed array are presented in a single Sonar Operator Console (SOC) which is highly operator intensive. This entails a complex and high workload for the single operator; consideration is being given to addressing HMI and specifically the workload associated with concurrency tasking.

Another UW feature is the addition of the Petrel Mine and Obstacle Avoidance Sonar (MOAS). The MOAS provides three dimensional imaging and automatic detection and tracking out to around 700 metres. The MOAS is controlled and monitored from the bridge. It performs extremely well in its designed role and provides a very useful aid to navigation in confined waters.<sup>25</sup> The FFG Petrel MOAS is the same as that fitted in the *Anzac* frigates, thus offering training and supportability benefits.

### THE COMBAT SYSTEM

The FFG Operations Room (Combat Information Centre - CIC) layout remains virtually unchanged from the original configuration. However, changes soon become apparent with new flat screen colour displays, although functionality is very similar to the former arrays with the NCDS functions retained. ADACS Baseline Build 3 software package is currently undergoing trials in *HMAS Darwin*. This brings Link 16 capability plus a number of fixes to address software integration problems identified during trials. The incorporation of advanced command and control (C2) and decision support features like automatic detection and tracking of



many hundreds of targets, dissimilar sensor data fusion, improved tracking in clutter, automatic threat grading, interfaces with weapons and sensor systems and the multi-tier weapons scheduler in the Mk 92 system significantly improve the C2 performance of the FFG and reduce operator workloads. A new Combat Data Link Management System (CDLMS) has been incorporated to enable Link 11 and Link 16 to be managed.

The upgraded C2 package includes an On Board Training System (OBTS) that provides sensor stimulation (the facility to inject false targets through the sensors) and effector (weapons) simulation to avoid safety issues. The OBTS is reported to be an excellent training aid that provides realistic presentations for operator training.<sup>26</sup>

#### **SUPPORTABILITY**

A major feature of the Upgraded FFG and one of the main reasons for initiating the upgrade is greatly improved supportability. In addition to the weapons and sensor upgrades already outlined several obsolete and obsolescent equipments have been replaced. The combat and weapons systems are now supported by AN/UYK 43 computers, which have replaced the AN/UYK 7 computers. Former FFG sailors will be pleased to learn that the often problematic ship's service diesel generators (SSDGs) and 400 Hz static frequency converters (SFCs), essential to the provision of power for the ship's systems, have been replaced. The former SSDGs have been replaced with Caterpillar diesel generators that are painted in stylish white and the SFCs are now solid state. Chilled water systems have been upgraded however the original signal data converters (SDC) have been retained.

Platform upgrades have included

increasing the limiting displacement from 4100 tons to 4200 tons. Modifications have included reduced electromagnetic and acoustic signatures. Improved resilient mountings for machinery have been incorporated to reduce self noise which contributes to enhanced sonar performance.

The Upgraded FFGs are in many respects now Australian "orphans" which means that Defence must take responsibility for configuration management and through life support. This offers challenges and advantages, like full control over software management and maintenance.

Inclusion of the WSSC is an important feature. A windfall logistics outcome from project delays and the decision not to proceed with upgrades to *Adelaide* and *Canberra* is that six ship sets of new equipments were procured. This means that further options for spare parts are available to support the upgraded equipments and the retired FFGs have been comprehensively cannibalised for spares to support legacy equipments.

#### **HUMAN CAPABILITY**

Human capability is an essential component of combat capability; indeed it is the most important capability factor. Clearly the FFG Upgrade Project has been a long and frustrating experience for many of the FFG personnel involved. For example, as the lead ship to be upgraded, the *Sydney* team have borne the brunt of much of the initial trials programs enduring the vague and dynamic nature of contractor driven schedules.

HMI has been identified as an issue with both the ES and UW systems and there may be shortcomings in other areas. Lack of familiarity with the new systems has been exacerbated by reduced access while the systems have been in contractors' hands. Also, given

schedule slippages, initial equipment application courses soon fell out of step with posting cycles. This has meant that some personnel have experienced the frustration of not being adequately trained for the systems they are to operate. Combined with systems performance teething problems it is not surprising that there has been a "crisis of confidence" among some FFG personnel. Now that systems integration and performance problems are being resolved perception and attitude issues may soon ease. Certainly the Upgraded FFGs are fine ships with excellent capabilities and hopefully all FFG personnel will soon become justly proud of being involved.

There may however be a more complex and demanding people issue that needs to be addressed. The Upgraded FFG in many respects represents a quantum leap in capability. For example, the new ES system is far more sensitive and capable than its predecessor and indeed any ES system in the RAN inventory. Similarly, the UW package with the active/passive HMS integrated with a TDS towed array that also offers a passive detection capability, provides a far greater level of capability and accompanying complexity than the RAN surface community has previously encountered.

Configuring smart systems for optimum performance and understanding the results generated requires equally smart and experienced operators who know much more than simply how to operate the equipment. They need to have a deep understanding of the operating environment, whether, for example it is the electromagnetic spectrum for electronic warfare or the acoustic environment for undersea warfare. The generic combat system operator concept supported by application courses may no longer be sufficient.

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## THE MOST CAPABLE WARSHIPS IN THE NAVY'S HISTORY SET TO JOIN THE FLEET



*A potent air defence package*

The advent of relatively advanced, very capable and complex systems in the Upgraded FFG may serve as a useful precursor to the introduction of the even more capable and complex AWDs. There may be a requirement for the Navy to revisit the issue of deep specialisation for systems operators in the surface community.

### TACTICAL DEVELOPMENT

During the preparation of this article the extent to which tactical employment of the Upgraded FFG has been the subject of thoughtful and experienced consideration was not able to be ascertained. Clearly the FFG presents a significant capability enhancement and its effective employment requires considerable tactical development effort, including experimentation and fleet trials to ensure that it is employed to the optimum effect in a range of diverse and demanding scenarios. The simple fact that the RAN has for the first time a genuine area AW defence capability at its disposal means that new thinking about tactical employment of the FFG should be a priority. When combined with the enhanced FFG UW capability, in a regional security context that includes rapid qualitative and quantitative improvements to maritime capabilities, including the proliferation of submarines, the need for concerted tactical development efforts is compelling.

### CONCLUSIONS

The FFG Upgrade Project grew from an evolving Australian defence policy context of indecisiveness, procrastination and lack of commitment to defence expenditure. The Project commenced in 1993 following a policy statement in 1991 that mid-life modernisations for surface combatants were considered not to be cost effective and would not continue. Concerns with supportability and survivability of the FFGs in a contemporary threat environment were the key drivers that led to the decision to proceed with an upgrade.

The contract for upgrading the FFGs was signed with ADI Ltd, now trading as Thales Australia Ltd, in 1999. The upgrade is one of the most sophisticated and extensive capability enhancements of a surface combatant ever undertaken. The parties to the Project underestimated the challenge and the Project has suffered schedule slippages to the extent that it is now some four and a half years late. Delays and relationship difficulties have contributed to frustration and disappointment for all concerned. This has impacted on confidence in the Upgraded FFG within the Navy and between the Navy, Defence and Government. Significant project management related lessons have been learnt and re-learned in what has been a difficult project for all parties. After an extensive contract renegotiation and the adoption of a more collaborative approach, the Upgraded FFG Project now appears to be on track to achieve delivery of ships to the Navy during late 2008 and during 2009 to meet the revised schedule.

The Upgraded FFG presents a higher level of surface combatant capability than previously available in the history of the RAN. For the

first time the RAN has a genuine ship borne area air defence capability. Air defence comprises several layers utilising enhanced systems and sensors combined with comprehensive hard and soft kill capabilities. The AW and anti-ship missile defence capabilities are impressive. The FFG SW capabilities have also been enhanced. The UW package is the most capable for a surface combatant in the RAN with the capacity to embark two Seahawk helicopters and improved onboard active and passive detection capabilities. These enhanced naval warfare capabilities are fully integrated with a unique Australian combat system. The combination of systems and weapons improvements provides a considerable naval warfighting capability in a compact package.

One of the key objectives of the Upgraded FFG was to improve supportability and this appears to have been achieved. Concerns remain with performance, integration and therefore acceptance of the ES and UW systems. Technical and other issues have been identified and are being progressively resolved. There is now confidence that the FFGs will soon be back in operational service.

Issues like HMI, human capability development and tactical development may require further priority attention. The Upgraded FFG provides a valuable growth path toward introduction of the AWDs and the lessons learned should be helpful when introducing that advanced warship in to service. The FFGs and AWDs will be in service together for several years, and along with the *Anzac* FFH, will provide the Navy and Australia with a small but potent surface combatant capability.

The Upgraded FFG is a highly capable warship that is well constituted to make a major contribution to Australia's maritime security over the next decade. FFG personnel will

## THE MOST CAPABLE WARSHIPS IN THE NAVY'S HISTORY SET TO JOIN THE FLEET

continue to serve with pride and distinction in these fine ships as they again become fully operational, now with much improved capability as fighting ships. ✎

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### Endnotes

#### (Footnotes)

1 'Provisional Acceptance' is a contractual term that means a ship, system or facility is passed from contractor to Navy control however it is not ready for operational employment. Significant known performance shortcomings are to be resolved by the contractor.

2 'Acceptance' means certification by the Project Authority that the Contractor has fulfilled its contractual obligations, subject to any omissions or defects listed, and that those Supplies or upgraded FFG

or upgraded facility or Upgraded Software conform to the requirements of the Contract. Acceptance is subject to Final Acceptance. Source: FFG Upgrade Contract.

3 'Initial Operational Release' of the capability is the milestone at which Chief of Navy (CN) on the advice and recommendation of the Fleet and Navy Systems Commanders, is satisfied that the operational and materiel state of the Capability and associated deliverables are sufficiently safe, fit-for-service and environmentally compliant to proceed to the Naval Operational Test and Evaluation (NOTE) period. It is also the milestone, where any delivery deficiencies with agreed contractual remedies are manageable within the NOTE period and are appropriately mitigated at this stage of the programme. Importantly, IOR also marks the change in ownership from the DMO to Navy.

#### (Endnotes)

1 Australian Government, Department of Defence, Defence Materiel Organisation, Projects: SEA 1390 Ph 2.1 - FFG Upgrade Project (FFG UP), 2 September, 2008. <<http://www.defence.gov.au/dmo/msd/sea1390/sea1390.cfm>> . A concise summary of the FFG Upgrade Project and its history is provided at this reference.

2 Australia Government, *Defence 2000: Our Future Defence Force*, Commonwealth of Australia, 2000, pp 117-118. In the 2000 Defence White Paper the government committed to '...the same proportion of GDP on defence as we are today. That remains 1.9 per cent'. There was also an ongoing commitment for defence expenditure to '...grow by an average of about three per cent per annum in real terms over the next decade'.

3 Australia Government, Department of Defence, *Australia's National Security: A Defence Update 2007*, Commonwealth of Australia, 2007, p 10. By 2007, due to changing strategic circumstances, Australian Government outlays on Defence had risen to "2 per cent of GDP". So far the Rudd government has indicated a similar commitment.

4 Australian Government, Department of Defence, *The Defence of Australia 1987*, Australian Government Publishing Service, Canberra, March 1987, p 43.

5 Australian Government, Department of Defence, *Force Structure Review*, Australian Government Publishing Service, Canberra, May 1991, pp 15-16.

6 Ibid.

7 Australian Government, Defence Materiel Organisation, op cit.

8 Australian Government, *Australia's Strategic Policy*, Commonwealth of Australia, Canberra, 1997, p 62.

9 Australian Government, *Defence 2000: Our Future Defence Force*, op cit, pp 89-90.

10 Ibid.

11 Australia Government, *Australia's National Security: A Defence Update 2007*, op cit, pp 50-51.

12 Ibid.

13 Sea Power Centre – Australia, Department of Defence, *Offshore and Out of*

*Sight: The RAN in the North Arabian Gulf*, Semaphore Issue 06, June 2008, <[http://www.navy.gov.au/spc/semaphore/2008\\_6.pdf](http://www.navy.gov.au/spc/semaphore/2008_6.pdf)> . The 40th separate deployment of Australian naval surface forces to the international coalition in the Persian Gulf area commenced in April 2008. Tasks have included enforcing United Nations trade sanctions through the imposition of maritime blockade and participation in naval strike and air defence operations during the two Gulf Wars. The FFGs initially bore the brunt of this commitment. However, recently the *Anzac Class* ships have been rotating through the northern Gulf to meet the national commitment.

14 Australian Government, Defence Materiel Organisation, op cit. The table was taken directly from the Project SEA 1390 web summary in September 2008.

15 Ibid.

16 McPhedran, I. "\$1.4b refit shipshape" *Herald Sun*, 30 June 2008, page 22. Greg Combet has been credited with adding impetus to progress of the FFG Upgrade Project, particularly assisting with created a climate where ES system problems can be resolved.

17 Australian Government, Department of Defence, The Hon. Joel Fitzgibbon MP, Minister for Defence, 29 Jan 2008, MIN80129/08, Speech by the Minister for Defence at the Pacific 2008 Maritime Congress and Exposition, Sydney. The Minister stated that "The delays, cost blow-outs and failure to deliver we've experienced in defence procurement in recent years cannot be allowed to continue." 2 September, 2008. <<http://www.minister.defence.gov.au/FitzgibbonSpeechtpl.cfm?CurrentId=7412>> .

18 *Defense Industry Daily*, 14 January, 2008, "Australia's Hazard (ous) Frigate Upgrade", 2 September, 2008, <<http://www.defenseindustrydaily.com/australias-hazardous-frigate-upgrade-04586/>> . This article is typical of the negative and critical commentary found in "informed" defence media.

19 This table was prepared from information provided by DMO in May 2008.

20 These remarks were made to the author during a sea riding opportunity in June 2008 in *HMAS Darwin*.

21 Initially SM 2 missiles will be employed in the "home all the way" mode. The mid-course guidance facility is to be incorporated in the near future.

22 Cobb, A. "East Timor and Australia's Security Role: Issues and Scenarios", *Current Issues Brief* 3, 1999-2000, Foreign Affairs, Defence and Trade Group, Parliament of Australia, Department of the Parliamentary Library, 21 September 1999. The Aegis-class cruiser *USS Mobile Bay* was available to provide air defence cover, <<http://www.aph.gov.au/library/pubs/CIB/1999-2000/2000cib03.htm>> .

23 Based on conversations with FFG officers and Surface Combatant Force Element Group staff.

24 These remarks were made to the author during a sea riding opportunity in June 2008 in *HMAS Darwin*.



# Information Operations Management in the RAN

BY DONALD DEAKIN-BELL

We live in the Information Age, where the ability to use information is the mark of a country's economic and social superiority. Superior Information Technology and analysis is the key to an advanced nation's competitive advantage. This is also true for a nation's military competitive advantage.

Information superiority in the military environment is created by the Hard Art of Soft War<sup>1</sup> the conduct of Information Operations (IO). ADDP 3.13, *Information Operations* states that IO 'is not a capability in its own right, but a collection of capabilities brought together and focused for a specific effect'<sup>2</sup>.

## IO IS

The integrated employment of the core capabilities of electronic warfare, computer network operations, psychological operations, military deception and operations security, in concert with specified supporting and related capabilities to influence, disrupt, corrupt or usurp adversarial human and automated decision making while protecting our own<sup>3</sup>.

IO is an integral part of Effects Based Operations (EBO), thus a major departure from the platform based mindset that pervades the RAN.

Information Operations are a "Whole-of-Government" development, beginning with Shaping and Influencing (S&I) conducted at the strategic-level and communicated to the operational-level, HQJOC, in the form of a Strategic Shaping and Influencing Plan (SSIP). HQJOC

develops an IO Annex in support of a Joint CONOPS along with supporting elemental appendices as appropriate. HQJOC disseminates the approved CONOPS to the tactical level via the component commanders in the form of an Operational Instruction (OPINST) containing the IO Annex. The IO implementation is chiefly carried out by tactical level units.

The RAN is involved in the implementation of these IO Annexes instructions using its tactical level units and capabilities, yet generally has not been involved in the development of the instructions that it has to implement as it has few people trained as IO Staff officers and no personnel allocated to HQJOC IO planning.

The RAN has capabilities and interests in many of the areas of IO, especially Electronic Warfare (EW), Computer Network Operations (CNO)/Information Assurance (IA), Military Deception, Operational Security (OPSEC) and Protective Security. The RAN does not coordinate these capabilities when it conducts operations, rather each capability operates as a separate entity.

## WHY IO IS IMPORTANT

So why is IO important to RAN? RAN Doctrine 1, *Australian Maritime Doctrine* talks about the 'Revolution in Military Affairs being drive by the information revolution.' and the 'high priority being placed by the ADF on

the development of the **knowledge edge**.' It states that 'A knowledge edge will exist when there is a comparative advantage in those factors that influence decision making and its effective execution.'<sup>4</sup>. IO is a major means that enables a force to have such a knowledge edge over adversaries.

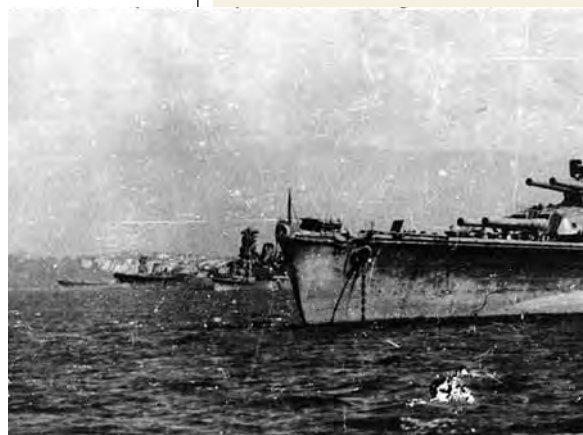
The RAN is increasingly operating in the littoral environment, with a focus on such activities as operations other than war including peacekeeping and constabulary operations and is also significantly improving its amphibious operations capability. This is a major change from the mid ocean blue water focus of the Cold War. In order for the RAN to create a knowledge edge to meet the challenges of Littoral Operations, the integrated capability offered by IO is needed. IO is a classic asymmetric force multiplier, which can either be used by our opponents or by us.

The important thing for the RAN to realise is that as CAPT Wayne P. Hughes states in his seminal book on Fleet Tactics, 'It is relatively rare for two fleets to meet simply and specifically to gain control of the sea. In most cases one side or the other has to deal directly and immediately with an object on land'<sup>5</sup>. The object of the threat or use of military power is to persuade an opponent to do your bidding. If this can be done without force, so much the better.

This paper proposes a means of managing Information Operations within the RAN.

Military Forces are used by the Australian Government to pursue National Policy in the international arena as a means of projecting National Power and persuading other nations and non state players to agree to Australian goals. The spectrum of use of the military ranges from co-operative regional engagement with other nations, through constabulary

*Blue water engagements will become increasingly rare... just prior to the Battle of Leyte Gulf. Ships are, from left to right: Musashi, Yamato, a cruiser and Nagato. (Courtesy of Mr. Kazutoshi Hando, 1970. US Naval Historical Center Photograph)*



## Information Operations Management in the RAN

operations, disaster assistance, peacekeeping, peacemaking to conflict<sup>6</sup>. In the majority of these situations, overt force is not used, rather national will and goals are obtained by other means. Means, such as IO.

IO is a way of conducting operations that relies on co-ordination of activities, both at the single service and joint levels. RAN operations are frequently carried out at the single platform or small task group level. This has created the current mindset among middle level officers of focusing on technical ship and weapon handling and tactical level issues. Yet, the RAN had a long history of IO type activities. The use of early warning information provided by Australian Coast Watchers, commanded by LCDR Feldt, and Signal Interception and Analysis, pioneered by LCDR Neve, were key navy activities that disrupted the Japanese Information cycle during WWII.

### SHOULD THE RAN BE INVOLVED IN IO PLANNING

Where does this focus on single service kinetic operations leave the RAN? Sadly, frequently missing or providing input as a very junior partner in the

joint planning stages of operations, especially in the planning of their IO components. For, while ADFP 3.13.1 states that 'IO is applicable across all levels of command and IO requires guidance from commanders at all levels and the input of specialist IO staff to accurately and effectively target the intended audience', most RAN commanders have limited, if any understanding of IO and the RAN has very few personnel trained as IO Staff Officers<sup>8</sup>.

The consequence is that when IO plans are developed at higher headquarters, RAN input is limited or non-existent and the plans developed by Army or Air Force staff officers. Thus IO plans do not benefit from an understanding of RAN capabilities or limitations. RAN units then are tasked to undertake tasks for which they are not suitable for and even worse are misused or underused for IO tasks.

Yet IO is vital to the RAN. In the area of PsyOps the RAN is often the only Aust forces to engage with persons in the maritime environment and can project positive or negative images and messages that can make or break an operation. Electronic Warfare is a major navy capability, a life or death requirement.

Information Systems are critical to Military Operations, they are the basis of Network Centric Warfare and modern platforms are useless without computer systems. It is possible for a small dedicated C2 cell in an otherwise unsophisticated organization to create a temporary knowledge-based advantage over a militarily superior force, which can be translated into a military advantage

over Australian forces.

The reasons for this lack of IO capability are varied. Lack of interest in IO capability starts at the higher level due to the platform based career focus that has moulded the mindset of many senior officers. This lack of interest flows to the lower levels, with the prime warfare focus of the RAN being on platform based kinetic capabilities, not the effect based capabilities that include IO. This is a consequence of the Junior Warfare Officer Application Course (JWAC) and Principal Warfare Officer (PWO) training continuum that emphasises platform based warfare, with limited focus on areas such as EW, IA, CNO and Military Deception. This lack of interest leads to a lack of trained staff. The low priority of IO leads to few RAN officers able to be released to undertake IO Staff Officers training due to high operational tempo and the many critical staff shortages in the officer ranks.

The consequence of this lack of capability is that not only are RAN operations less able to use IO as a tool, they are vulnerable to enemy IO operations. Examples include the deception operations used by the Serbian Forces in Bosnia, the "Turning around your high-powered, fully wired expeditionary force in Somalia with a single, 30-second video clip"<sup>9</sup>, the Internet based Psy Ops campaign of al Qaeda, and poor OPSEC that contributed to the bombing of the USS Cole. It should be noted that nations such as China are increasing the focus on IO as a means of developing military competitive advantage.

### INVOLVING THE RAN IN IO

Involving the RAN in IO needs to start with the basics. Raising awareness is essential, not just about IO, but about component elements that contribute to IO such as Intelligence, EW, Crypto Analysis, Military Deception,

### The Span of Maritime Tasks<sup>7</sup>





Psychological Operations (PSYOPS), OPSEC and especially Counter IO. IO needs to be included into revised RAN Doctrine publications.

Briefing of senior officers is a primary requirement, followed by the need to foster awareness of IO among the Naval Warfare community and general naval community, especially in the officer and senior sailor ranks. But before any of this can occur, IO in the RAN needs a sponsor.

IO is a cross discipline joint activity. The best IO planners are people with a flexible mindset whose background could be Supply, Engineering, Communications, as much as a PWO. However, it is still a warfare activity and the best sponsor is the Head of the Naval Warfare Community.

### **ORGANISING & TRAINING FOR IO**

The actual work would be done by the Directorate of Naval Intelligence, Surveillance, Reconnaissance and Electronic Warfare (DNISREW) within the Navy Communications and Intelligence Branch, preferable by allocating a dedicated Staff Officer to RAN IO development. DNISREW already deals with many of the elements that make up IO. DNISREW would also chair a Navy IO working group to co-ordinate the raise train and sustain aspects of Navy IO.

DNISREW would work with the Training Authority Maritime Warfare

### *Kri Sutanto in a deception pattern often used by navies inshore*

(TAMW) which would take the lead in IO training in the RAN. The PWO Faculty at HMAS WATSON would be tasked to work with the ADF Warfare Centre (ADFWC) to develop modules at the appropriate level. These single service modules are to be a supplement to not a substitute for the joint ADF IO course.

At the Application Course level (i.e. Junior Warfare Officer Application Course, Supply Officer Application Course, etc), a basic overview module about IO, its elements and effects is all that is required. Such a module would be similar to the IO module presented on the ADFWC Introduction to Joint Warfare Course. Following this at the intermediate level such as the PWO course, a module going into greater depth especially about Naval IO elements such as EW, Military Deception and counter IO.

The Force Warfare Officer (FWO) and CO/XO designate course level is where a greater level of IO understanding is needed. FWO's are required to advise and plan at both the Task Group and Joint levels and need to develop their tactical plans in conjunction with Operational Orders which will include IO plans. CO's and XO's are required to implement IO plans. The training requirement at this level is high, with personnel needing to understand their place in an IO plan as well as be able to provide advice about

RAN capabilities or limitations to the IO staff officers who are developing the plans. A targeted mini IO module for these courses needs to be developed for these groups, focusing on what the RAN can do for IO and what IO can do for the RAN. Again, this is a

supplemental to the joint, operational-level IO course.


IO Staff Officers at single or joint headquarters develop the IO plans that the RAN implements, yet the RAN has consistently not filled its quota of students on the ADFWC IO Staff Officers course for many years. This is partially because high Op Tempo makes releasing personnel difficult, but also because attendance is generally a self-selection and unit-funded, not DNOP-funded process. It should be a requirement that a number of officers, especially those who have completed the FWO course and also officers from other branches that have or are likely to have joint experience attend the course, to develop a pool of RAN officers able to plan IO. The Directorate of Naval Officer Postings (DNOP) should be involved in the selection of these officers as part of the career and workforce management process.

The Navy's operational environment is changing, with a shift away from the mid ocean blue water focus to a littoral focus. Navy capabilities need to change to meet the new demands placed upon it by the many operations other than war it is now involved in. Non kinetic means are needed for this environment and Information Operations need to be part of Navy's tool box.

While IO is important, the RAN has not done enough to develop an IO capability. It needs to raise, train and



## Information Operations Management in the RAN

sustain such a capability in order to contribute to national policy in the 21<sup>st</sup> century. 



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*He has a BA in Political Studies and International Relations, a Graduate Certificate in HRM and graduated from the RAN Staff Acquaint Course at the ACSC.*

### GLOSSARY

**Defensive information operations (IO)** are processes, synergised with wider activities and plans, designed to ensure friendly information, information processes and information systems are protected from attack or an adversary's use of offensive IO, or from accidental or naturally occurring acts.

**Effects-based Operations.** The planning and conduct of operations in such a way to achieve a desired effect on the target

**Electronic warfare.** Military action

involving the use of electromagnetic and directed energy to control the electromagnetic spectrum and to attack the enemy. Also known as EW. EW includes electronic attack (EA), protection (P), and electronic support (ES).

### ENDNOTES

- 1 , Although IO can be very "hard," employing kinetic weapons in support of OPSEC, Deception, PSYOPS.
- 2 ADDP 3.13, Information Operations, ADFWC, April 2003
- 3 Joint Publication 3-13 Information Operations; United States Department of Defence; February 2006. Australian doctrine refers to 11 elements: OPSEC, Deception and Counter Deception, PSYOPS and Counter PSYOPS, EW, CNO, Targeting (Physical Destruction), Counterintelligence, Protective Security and Military Networking and 3 supporting elements: Civil Affairs (CIMIC), Public Affairs and INT
- 4 "Australian Maritime Doctrine (RAN Doctrine 1); RAN Sea Power Centre, 2000
- 5 Fleet Tactics, Theory and Practice; Capt Wayne P. Hughes Jnr, USN Rtd; Naval Institute Press, Annapolis; 1986; p10
- 6 Australian Maritime Doctrine (RAN Doctrine 1); RAN Sea Power Centre, 2000, p 19 describes the Spectrum of Conflict in detail
- 7 Navy Contribution to Australian Maritime Operations, RAN DOCTRINE 2 – Sea Power Centre 2005, Introduction
- 8 ADDP 3.13.1, Information Operations Procedures, ADFWC, November 2006, p 1-1
- 9 Weaponry by CNN, The Inquire



Sea Hawk Tiger 79 on the flight deck of HMAS Melbourne

# THE VERNON PARKER ORATION 2008

## *The Navy & the White Paper*

BY PROFESSOR KIM BEAZLEY<sup>1\*</sup>

By now the skeleton and a lot of the sinew of this government's first White Paper on defence should be completed. What remains would be the task of establishing the blood flow – timetables on the acquisition and replacement of capabilities and, above all, the long term funding.

The writers of it have a decade of background behind them of coping with appalling government indiscipline. Featured heavily have been mammoth budget busting acquisitions with no properly thought through military/strategic justifications nor consideration given to their place in the queue alongside programmes to deal with glaring inadequacies in our force structure.

On the testimony of Hugh White, the author of the last White Paper, his competent effort was ruined by a Prime Ministerial directive that no capabilities were to be dropped or diminished, rendering impossible the timely incorporation into the Defence Capability Plan of new capabilities to address new circumstances. The White Paper was followed by a series of Defence Updates which until the last, completely undermined the strategic rationale for the long term planning of our defence forces. Only last year's paper attempted to rein in the horses. What a tragedy in an era of relative defence plenty. What a danger in a region where slowly but surely the drift in the distribution of power is against Australia.

In some ways the confusion is understandable. We face a complex world. As US Secretary for Defense, Robert Gates, said in the National Defense Strategy he released in June: 'The United States, our allies and our

partners face a spectrum of challenges, including violent transnational extremist networks, hostile states armed with weapons of mass destruction, rising regional powers, emerging space and cyber threats, natural and pandemic disasters, and a growing competition for resources.'

Plan a force structure around that! The answer of course is you don't have to. What you have to do is to peel the threat away to arrive at core elements that permit rational planning for defence forces. Discern what is primarily a problem for diplomats, governance experts, civilian specialists, law enforcement authorities and intelligence agencies. Establish what the defence force is uniquely equipped to respond to and separate that out from where it can lend a hand. Lending a hand is not a force structure determinant.

Again, Robert Gates is helpful: 'in the long run the Department of Defense is neither the best source of resources and capabilities nor the appropriate authority to shoulder these tasks. The comparative advantage, and applicable authorities for action reside elsewhere in the US Government, at other levels of government, in the private sector and with partner nations. DoD should expect and plan to play a key supporting role in an interagency effort to combat these threats and to help develop new capacities and capabilities, while protecting its own vulnerabilities.'

In recent times the immediate challenge of transnational terrorist threats and criminality, particularly when intersecting with the problems or strategies of failed and rogue states and the spectre of WMD proliferation,

has gripped the imagination of Defence planners. Throw natural disasters and pandemic threats into the mix and you have a witch's brew that would tax the lifetime of most defence planners. A bit of thought, however, would walk such a planner back to Gates' position. Here defence helps out but its force structure must be determined by other factors.

The last couple of years have started to draw us back to the problem that has always been the primary commitment of defence forces – employment in interstate conflict with capacities drawn down for these broader purposes from a force structure built around national defence against a structured enemy.

George W. Bush, as he sought to refocus the still shocked American people after the 9/11 atrocity, spoke of a Western Cold War triumph in his 2002 US National Security Strategy. The West's victory provided 'a single sustainable model for national success: freedom, democracy and free enterprise.' Paul Kelly drew attention to this quote in an excellent short article recently which pointed out there was a more authoritarian model on the rise in Russia and China. We may thank our lucky stars that neither has an interest in transnational Islamic fundamentalist terror or in the spread of WMD.

But the rise of this alternative model does refocus us on state structures. Whatever internal weaknesses exist, it is the nation state which is likely to sustain capable defence forces with power projection capabilities and nationalism which is likely to be used to enforce state cohesion. Two characteristics may be discerned among the states of our region of strategic interest. One is that they,

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## THE VERNON PARKER ORATION 2008

### *The Navy & the White Paper*

along with the Africans, are the last bastions of the Treaty of Westphalia. They take their neighbours, the borders and their internal right against external interference very seriously. The second is that we inhabit a religious environment in which Islamic belief is very strong either as a majority or a large minority component of the state populations.

This should be pause for thought, not nervous atrophy. Be they enticed by an authoritarian model, nationalist in outlook or the locus of religious fervour, they want to be peaceful and wealthy, whether or not their claims on each other might contradict this interest. They are energy hungry and as the Minister for Resources has pointed out, we are an energy superpower and a resources bank. There is much ice to skate on for our politicians, diplomats, businesses and our internationally oriented service providers, in a way which would guarantee our security.

Their efforts may from time to time fail, and here the question of the region's military capabilities come into play. To avoid provocation our ally now defines its force structure around threatening capabilities, not threatening states. We pioneered this approach in the 1987 White Paper. What gave it discipline was the close interrelationship between general strategy – self-reliance within the framework of alliances; threat measured by regional capabilities; military strategy, defence in depth focussed first on our approaches; force structure; affordability – realistic guidance.

Those who write this White Paper must come back to our maritime capabilities and the new field of cyber warfare. The key difference now as opposed to 1987 is that regional capabilities are improving at a faster rate than ours, making careful selection more important. New

capabilities mean that in geographic terms, regional capabilities have to be measured even further out for our identification of the area in which we need to be able to assert strategic dominance or at least denial. Usefully diplomatically we could stop short of the archipelago: I am not sure we could do that now. One thing we can be certain of is that a properly devised force structure will again give us plenty of scope to collaborate both with our main ally and those in our region. It will also give us plenty of options in dealing with the defence component of that multiplicity of threats I described earlier in the supportive manner that Secretary Gates describes for the role of American forces.

The yawning gap in our maritime capabilities is anti-submarine warfare. This will be critical when new submarines are considered, helicopters for our surface vessels, networked battle space and our Orion P-3

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replacements. I will deal with some of this later in the lecture. We will have the capacity to embark half the Army's combat capability on the new LHDs but with the underwater environment developing in the region, a government would be foolhardy to put them to sea in anything other than the softest of circumstances.

The critics of our 1987 White Paper pondered whether it left us sufficiently engaged with our allies. This was not a question that troubled our American ally in the aftermath of the White Paper's presentation (it did before). Secretaries Schultz and Weinberger in Sydney in June 1987 ticked off on a force structure which provided plenty of options for the independent advancing of Western interests in the eastern Indian Ocean and South East Asian littoral and collaboration with the US further afield.

In the second Vernon Parker oration I reported these facts to you all on 6 September 1989, in a speech entitled Key Concepts in Australia's Strategy. I said then: 'It is evident we are coming to terms with the fact that our maritime strategy has two distinct but completely interrelated aspects: the self-reliant defence of our maritime approaches, and the cooperative promotion of our maritime interests.'

Far from assuming a benign environment in our region, I pointed out that it would be subject to great change: 'there has been strong economic growth among a number of medium sized powers bordering the Indian and Pacific Oceans. It has been accompanied by the emergence of greater confidence in their national strength and, in some cases a concern to exert more comprehensive influence beyond their immediate borders. Importantly from the point of view of Australia and our neighbours, it is in the maritime environment that this new found confidence is

being displayed. We are looking at a system of multiple centres of power not dissimilar, except for its scale and geographic character, from the European State system of the early 19<sup>th</sup> century.'

I identified those states as India, China and Japan. But also 'Regional force structures, which have traditionally given priority to ground forces, are changing emphasis. Among the ASEAN nations, Indonesia has recently acquired four Harpoon-firing frigates and two mine counter measures vessels. Malaysia is purchasing more than \$2.5 billion of defence equipment from Britain, including an Oberon class submarine for crew familiarisation and ASW training, WASP helicopters and maritime strike aircraft. Thailand took delivery in 1987 of two US-built Harpoon equipped frigates, mine counter measures vessels and ASW Corvettes. Regional air defence capabilities are similarly being upgraded.'

Not bad for 1989. Everyone talks of a multipolar system now. This was before the end of the Soviet Union. In fact the paper contained something of an underestimate of the role of expanding Chinese capability and a slight overestimate of the pace of change in South East Asia, but the world described is with us now.

I did not mention one development which predated the speech. That was the proposed (it did not eventuate) commitment to the Persian Gulf of a clearance diving team, though I had plenty to say about collaboration with the US. That had occurred at the end of 1987. It was made during the later phases of the 'tanker war' component of the Iran/Iraq War, in support of British efforts to escort Australian merchant ships operating in the Gulf. It was a commitment informally sought by the US. It foreshadowed twenty

years of commitment alongside the US in the Gulf and its hinterland. In the speech, I did foreshadow the types of independent commitment we have made in the South Pacific and South East Asia for crisis stabilisation and capacity building.

Ironically for an alliance built around troubles in the Pacific, for the last 20 years our engagement with our ally has focussed on the Persian Gulf. In that time, we have seen the Navy deploy DDGs, FFGs, ANZACs, amphibious ships, supply ships and clearance diving teams. The Army has committed SAS, commandos, infantry elements, engineers, communicators, elements of mechanised forces, transport capabilities, rapier air defence batteries, and even some artillerists, but without their guns. RAAF has committed FA-18s, in-flight refuellers, C-130s, P3Cs, airfield defence guards and air traffic controllers. All three services have committed personnel to command arrangements and logisticians. They have been in wars, blockading arrangements and peace-keeping forces. They have filled niches in the rear and the front-end. While not necessarily providing all our allied armed forces might have liked, the commitment has been completely to the satisfaction of the leadership of our ally.

I recollect with great enjoyment a day and night on board *HMAS Arunta* and *HMAS Melbourne* during the blockade phase of the sanctions on Iraq. One of the highlights was a visit to the *USS Hopper*, an Arleigh Burke class destroyer from whence an Australian captain commanded the allied operation at the head of the Gulf. This situation still exists, though now the task is protecting Iraq's oil terminals. If ever I needed an education in the value of AWDs, I got it then. Their broad area surveillance capabilities provided an effective centre for a networked

## THE VERNON PARKER ORATION 2008

### *The Navy & the White Paper*

operation.

It was good to see first hand the effectiveness of the ANZACs in the close waters of the Gulf. I was not surprised to read later of their substantial role in the Iraq war. The waters are ideal for mining. Counter mining measures are another Western navy weakness. Though not in 1987 but subsequently, our clearance divers played a significant role.

I worry about one thing. That is the situation of our ships, should the current dispute with Iran over the development of their nuclear systems turn to war. As they did in the 1980s, the Iranians would attempt to shut the Gulf down. They have been preparing submarines, land-based missiles, legions of small rocket craft and much upgraded mines for a reprise of their littoral guerrilla warfare of the 1980s. The Americans would eliminate the threat but there would be some nasty days before that happened. I don't think our ships would necessarily cope too readily in the environment so I hope serious contingency plans have been developed.

All this has been done with the force structure planned for the defence of Australia's approaches in 1987, augmented slightly by the amphibious component incorporated in the 1994 White Paper. The type of 'out of area' collaboration was completely anticipated in the White Paper, if not the intensity in its ultimate location.

Having said that, when the services are examined, the Navy looks least like the one anticipated in 1987. Then we expected the surface fleet to exist in three tiers. The top tier was to be the DDGs and the FFGs, the second tier the ANZACs, and the third patrol boats and MCMs. The submarines were the main strike element. Combining the top tiers, we expected 17 ships. We hoped for eight submarines. The AWDs were to replace

the DDGs, not as has happened, the DDGs and FFGs. We expected the ANZACs to be ASW work horses. We tried to sell four to the New Zealanders on the same basis.

The 1987 White Paper structure for the Navy was carefully planned. As I said in the 1989 Vernon Parker oration:

The importance of maintaining our superiority together with the possession of significant maritime and some strategic strike capabilities is clearly acknowledged. So too is the priority accorded to the protection of maritime focal areas and choke points. It is there that an adversary would have the greatest opportunity and capability to threaten our trade and to strike at strategically significant targets in the adjacent littoral area.

Given the vastness of our maritime approaches and the range of interests we may need to protect, the implementation of an effective maritime strategy imposes great demands on the ADF. The absolutely prime requirement is the ability of the navy and the airforce to operate together in a completely integrated way, reflecting the fact that the sea and the air constitute a single operating environment in the sorts of contingencies which we might credibly face.'

That requirement remains as valid today as it was then. If anything, recent shifts in US strategy have made it even more relevant. The 2001 Quadrennial Defense Review redefined the task for USN in modern warfare from a blue water strategy to a green water one. Action on the littoral where weaker nations could build a local asymmetrical challenge to US dominance was perceived as a key force structure determinant. The main littoral to be contested was a line from the Bay of Bengal through the South East Asian archipelago to north of the Japanese seas, highly coincident with

some of the areas we identify.

Like the US, we see the region as friendly with a determination diplomatically to keep it that way. Like the US, however, we have to plan on the basis of the capabilities being developed in the area against a day when things are not so politically benign. This is a very difficult task politically.

We should note that our region is shot through with maritime and land border disagreements. Almost every state has some point of difference with its neighbour. By and large, the nations of the region contain these points of disagreement and long may that continue. However, there are flash points now on the Thai border and endemic disagreement in the South China Sea, not to mention issues in the Taiwan Strait.

One example close to home is interesting. In its annual report to Congress on the Military Power of the PRC, the Pentagon reported:

In December 2007, China announced the elevation of Hainan Province's Xisha Islands office to a county-level office named 'Sansha City' which would hold administrative jurisdiction over the Paracel and Spratly island groups, and Macclesfield Bank – claims disputed by Brunei, the Philippines, Malaysia, Taiwan and Vietnam. A PRC spokesperson asserted that China has 'indisputable sovereignty' and effective jurisdiction over the islands of the South China Sea and 'the adjacent waterways'. In reaction to China's declaration, hundreds of Vietnamese protestors demonstrated outside the Chinese embassy in Hanoi.

Most nations in the region are upgrading capabilities for surveillance, air and sea, to pursue at least denial if not control capacities over substantial maritime areas. Most interesting are submarines. Bangladesh, China, India,

Indonesia, Japan, Malaysia, North Korea, Pakistan, Russia, Singapore, South Korea and Vietnam all have or are acquiring submarine capabilities.

Generally speaking, acquisition of submarines upgrades a nation's intelligence gathering and the preparation of battle zones containing not only a torpedo and missile threat but also capacities for clandestine mining. Submarines, even in peace time, are used very aggressively. As the Cold War demonstrated, their operations are replete with opportunities for clashes with submarines and other nations' surface vessels. There seems to be a licence for submarine operations not dissimilar to that extended to intelligence services. When combined with more effective aviation in maritime contexts, a very different picture emerges from the benign one of waters plied by massive numbers of merchant ships, fishing fleets and coastal boats.

As has been pointed out by Andrew Davies of ASPI, Australia's ASW capability has not advanced in the last decade or so, if anything it has retreated. The Seahawk helicopters have not been given dunking sonar. Towed array has not been put on the ANZACs though it is on their New Zealand version. Hull-mounted sonars, essential though not sufficient in themselves, are not up to date. Thankfully, the Sea Sprite has been abandoned. It was not optimised for ASW. A replacement that is, is essential for the ANZACs, the new AWDs, and the LHDs. To which you could add the P3Cs are doing magnificent surveillance in the Gulf, but it is not ASW.

We have reached a critical point. Andrew Davies' paper of last year, 'The Enemy Below: Anti-Submarine Warfare,' will have been read by most people here. He lays out a convincing scenario for layered defence of our

LHDs and AWDs in which they are active participants themselves. He lays down requirements for hull-mounted sonar I hope are being incorporated in the new ships. We can say with certainty however that the helicopter component and its equipment is a long way down the track in the Defence Capability Plan. This is unsustainable. We are entitled to be worried now. By the time the AWDs and LHDs come into service, we will be frozen with fright.

I want to conclude with a discussion of our best ASW platform – obviously the submarine. But before I do, I want to discuss one other matter which if not addressed, will collapse the best outcome we might envisage in all these areas. It is a matter that would have been close to Vernon Parker's heart. That is the question of recruitment and retention. It is appalling to think we cannot man all our submarines. The USN can double crew some of theirs. The position in the surface fleet is not much better. We are paying off ships before we need to because of crewing difficulties. Part of the reason for acquiring the LHDs, which I think are too big for our requirements and don't give us enough amphibious platforms, was that it would reduce Navy's crewing requirements against that wider capability. I'll lay London to a brick we will start thinking about AUSTAL's littoral ships to fill that gap if we solve the crewing issue.

Navy experiences similar recruitment and retention challenges to industry but the stakes are higher. Navy is often competing with the demanding mining sector. The lustre of the life-long career that the military offers is dimming. Recently Ernst and Young, in which I chair its Defence practice, completed a study into the drivers of retention performance in Navy, using the technique of 'choice modelling.' While I won't comment on

this study, EY's work in this area reveals common threads, that may be worthy of consideration equally by Navy and its Defence industry providers.

First, it is evident that many policies, processes and procedures in large enterprises work against retention. These are often cumbersome, discriminatory and often based on 'one size fits all'.

Secondly, adopting a life-stages approach can dramatically improve the situation. By life-stages approach, I mean having policies that recognise the different stages that people go through during their working life. The lesson in the above two points is that many things that can improve retention performance are in our control and ability to change. Currently, half the defence force shifts every year. Apart from the disruption to life, each move costs Defence \$30,000.

Thirdly, data is important. All of us have theories about why people might leave or stay and which levers to pull or push to improve retention. However, unless data-driven, discussions about changing career management practices, pay or conditions may not effectively achieve retention outcomes. A good example can be found in relation to the UK MoD Armed Forces Personnel Agency. This agency reported that taking an holistic view of pay and conditions across the Armed Forces enabled lower total employment costs and at the same time, targeted retention levels were achieved.

Admiral Peter Briggs for the Submarine Institute has been working hard on the Collins replacement. The decision by Joel Fitzgibbon to bring forward the project makes possible Peter Brigg's view that it should be in sea trials no later than 2022. His paper bears close reading not only on the capability required in the new submarine but also on the acquisition process. In this short time



## THE VERNON PARKER ORATION 2008

### *The Navy & the White Paper*

I want to comment on three issues.

The first is the size of the submarine and the second two are related to the acquisition strategy and the privatisation of ASC.

Firstly on the size. Evidently we are to have a debate about whether or not we need a small submarine and lots of them or fewer large ones. This debate should not have resurfaced. Our submarine must be capable of long distance, clandestine operation in waters with which Australians are familiar but European small boat designers are not.

Small submarines will not be able to compete with the types of boats being brought into service in the Indian and Chinese navies, at least always assuming they can be got in clandestine fashion into the relevant waters. Must we trash our design capability, so hard won in the Collins programme?

Briggs lays down six roles for the new submarine beyond that of surface strike: surveillance and intelligence gathering; anti-submarine warfare; land strike; battle space preparation (effectively preparing areas for taskforce operations); an expanded range of special forces operations; and a clandestine mining capability. To which I would add anti-air capability in part for its protection but maybe some other uses. We cannot put optimal sensors, weapons systems and deployment space associated with all these tasks in a small hull with maximum survivability against what may be sent against it. These studies were done *ad-absurdum* before the Collins acquisition and the environment was more benign then, and a submarine was perceived of as having less capability. That is not to say small submarines are not useful, but we are not Singapore.

Briggs points to the following as special features of the Australian environment. Long transits and short

notice contingencies demand high levels of mobility and endurance. Tropical littoral oceans enforce demands on the life support/habitability systems and require high agility and prolonged covert operations on the approaches to and in operating areas. In this environment, the submarine will require low signature in all spectrums and at high speed, imposing new demands on submarine design. Current European designs do not offer the range, endurance, high speed transits or payload capacity and flexibility Australia requires.

ASC now contains the only design team in Western navies capable of designing a large conventional submarine. Whatever happens with privatisation and subsequent acquisition of the submarine, its destruction or decimation would be folly.

Our problem is this. For the submarine's capability to be optimised, collaboration with the USN is essential in new technologies. They simply will not pass critical knowledge across to the Europeans or maybe even a private all-Australian owner. The latter, however, might be capable of being managed, particularly if Electric Boat was involved, but that would require work before the sale of ASC. We would want to be sure.

ASC must deliver the new submarine. Competition is fine in theory but no other builder of submarines other than the US operates on that basis and it knows only two competitors. Cost controls are established by effective negotiation with the provider. There are enough equivalent operations elsewhere to establish effective cost controls. To move away from this model means reinventing a very hard won wheel, with all the problems associated with the Collins re-emerging, and the US out of the picture. They will be loath to

take on a European partner.

If ASC is not sold with a clear path to the submarine programme, a proper sharing of risk with the government on the Air Warfare Destroyer and either the common user facility in Adelaide or guaranteed access to it, it won't be worth a great deal.

We are at a very risky point in all this. Along with the F111 replacement, this will be Australia's most difficult defence decision. On it rests in large measure our capacity to meet all contingencies an era of diminishing Australian relative power is likely to throw up.

We are attempting to defend ourselves, devoting a percentage of our GDP to defence no greater than most European states and less than some, despite the fact that our threat environment is more complex. If we were spending the same percentage of our GDP on defence as we did when I was Defence Minister, we would be spending \$3 billion a year more on defence. Yet in budget terms our defence expenditure is not ungenerous. Australia has much lower public sector/GDP ratios than the Europeans so ours involves greater effort. Therefore we can expect no more. The challenge is there for our White Paper writers – not one wasted dollar.

The Australian Naval Institute does this country great service, composed as it is of people who personally contributed greatly. I appreciate the chance you have given an old Defence Minister to speak his mind. My ex-colleagues now in government want to do the right thing by the country. I am glad you want to help them. ✎

# A CAUTIONARY TALE – FAILURES OF JAPANESE AIR POWER IN WWII AND LESSONS FOR AUSTRALIAN MARITIME AIR EXPANSION<sup>1</sup>

BY LCDR MATHEW BRADLEY

*I cannot but recognise the remarkable power of airplanes, seeing the results of last night. These battleships [HM SHIPS Prince Of Wales and Repulse] that had participated in the sinking of the Bismarck proved to be poorly equipped for a defensive battle, though they were the newest and most powerful ones.*

- Admiral Matome Ugaki.<sup>2</sup>

*Photo opposite: A Zero fighter from the Pacific Aviation Museum. Used widely in WWII, the naval variant was a premier fighter in the early years of the war*

*The Fleet Air Arm will provide Navy with the inherent advantages of airpower in a graduated response that enhances the inherent naval characteristics of deterrence, persistence, lethality and reach.*

- Naval Aviation Force - Guidance.<sup>3</sup>

These two statements highlight the historical and future necessity of air power to augment and protect modern maritime forces. The first quote illustrates the vulnerability of maritime forces exposed to air superiority, while the latter expresses the desirability for the burgeoning Australian Defence Force (ADF) maritime expeditionary potential to be augmented by a deployable air power capability.

In light of these two statements Japanese air power development in WWII has some important military and strategic lessons for the ADF through consideration of certain failures of maritime air power.

Prior to 1941 Japan was a maritime nation that was politically and militarily focussed on a continental conflict, a set of circumstances that parallel Australia's post Vietnam



preponderance for a continental defence outlook that relied on the northern sea/air gap as a natural, cost effective defence. In recent years however, Australia has shifted emphasis from the geo-strategic towards a more expeditionary outlook that encompasses a willingness to militarily intervene in regional affairs. With the impending integration of maritime expeditionary assets into the ADF, the projection of maritime forces must be fundamentally linked to the ability to achieve air superiority to ensure that land forces are safely deployed.

In more strategic terms, the integration of air power fundamentals within maritime strategy will help ensure that we never suffer from an economic stranglehold from an aggressor state. Japan recognised the importance of naval aviation in military strategy prior to 1941, but preoccupation with the less critical continental military threat resulted in a division of resources between the army and navy that eventuated in the failure of Japan to adequately train personnel, sustain an air power based military posture and defend territorial possessions and sea lines

of communication – all contributing factors to defeat in 1945.

## FAILURES OF JAPANESE AIR POWER

Beyond stating that air superiority was a component of the Japanese subjugation of Manchuria and that the limitations of Japanese Army direct support air operations against the Soviet Union precipitated defeat in 1939, a comprehensive assessment of the role of air power in Japanese continental ambitions is beyond the scope of this discussion. What can be ascertained is that during the three month period after Pearl Harbor, the 'mobile concentrated air power'<sup>4</sup> of the Imperial Japanese Navy (IJN) proved that localised command of the air was a decisive component of successful attacks against naval forces (the sinking of *HM SHIPS Prince Of Wales* and *Repulse*), land forces (Malaya and Singapore) and strategic bombing (Darwin).

These examples are impressive but are fundamentally undermined by the fact that no attack was conducted against any air force that enjoyed parity with Japan until the commencement of carrier based warfare with the United

## A CAUTIONARY TALE – FAILURES OF JAPANESE AIR POWER IN WWII AND LESSONS FOR AUSTRALIAN MARITIME AIR EXPANSION



Royal Navy amphibious landing platform dock HMS Bulwark shown visiting Hamburg in Germany-photo by Michael Nitz

States Navy (USN). Once faced with a comparable adversary, the failure to maintain this air superiority was due to a critical inability to sustain offensive air projection that was a direct result of force preparation; namely the development and sustainment of training systems, doctrine, technology, tactics and command and control.

### AIRCREW TRAINING

Although sufficient Japanese pilots were recruited to serve during WWII, the reconstitution of IJN assets and personnel lost at the Battle of Midway (June 1942) was severely restricted due to fuel shortages and priority allocation of resources to the land campaign in China. Without replacement, experienced aircrew remained deployed, further compounding the limitations of providing adequate training staff for *ab-initio* pilots and increasing the risk of losing the most experienced aviators in battle.

Training of a carrier pilot was thorough and routinely took six months; therefore the loss of aircraft and personnel without replacement was a 'considerable blow' to IJN tactics, and resulted, by mid 1942, in the decline of the average skill base of the Japanese aircrew to the point where Allied pilots could claim professional superiority. 'Despite great sacrifice and

huge losses, their air operations had become almost totally ineffective,<sup>5</sup> and failure to maintain a deployed carrier strike force resulted in an over reliance on army pilots who were inadequately trained to conduct fleet support reconnaissance and strike activities, reflecting a critical loss of focus on the concerted maritime offensive strategy of 1941.<sup>6</sup>

### COMMAND APPRECIATION OF AIR POWER

In the years prior to Pearl Harbor, Admiral Yamamoto was cognisant of the risks of going to war with America. After a decade of continental military strategy against China, the prospect of simultaneously attacking Western interests in Asia and the Pacific indicated to him that victory could not be achieved through 'any ordinary strategy', but rather through a joint maritime/air offensive.<sup>7</sup> A long time advocate of naval aviation, he was often at odds with traditional IJN Mahanian doctrine of defeat of the enemy through decisive capital ship battle. Given that he spent the majority of the 1920s in America it is feasible that he would have studied General William Mitchell's air power theories as a precursor to his own advocacy and training of carrier based offensive operations.<sup>8</sup>

It is interesting therefore to hypothesise that in one individual an appreciation of Mahan (the decisive

fleet engagement) and Mitchell (the vulnerability of capital ships to air attack) existed as a command force to promote an air power based approach to contemporary maritime warfare (and was demonstrated in the Yamamoto led IJN victories prior to Midway). This however was not translated into widespread doctrine, with surface warfare officers dominating the lower

command ranks of the IJN who never fully appreciated the revolution of naval warfare that Pearl Harbor represented.

For army aviation, no comparable leader existed to formulated strategic air power usage, nor was there a cadre of air experienced personnel to champion an independent air force. Hence, army aviation and later ground based IJN air forces, were rendered subservient to ground forces and subsumed in direct tactical direct support dogma.<sup>9</sup>

### TECHNOLOGICAL AND DOCTRINAL DEVELOPMENT

The development until 1941 of maritime aviation extended to the building of an extensive carrier force, development of aviation technologies and training of aviation personnel. Even though this mantra of air power appeared ascendant in Japan's overall military strategy, it was fundamentally undercut by command elements within the IJN that still believed in the primacy of the battleship. This preponderance with traditional naval warfare allowed vital material resources to be diverted from carrier and aircraft production to build capital warships that fatally undermined the ability of the IJN to project air power beyond the inevitable attrition of war against the USA.

This preponderance also extended to the IJN leadership which, with the death of Yamamoto, ignored fundamental appreciation and

Isoroku Yamamoto







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## A CAUTIONARY TALE – FAILURES OF JAPANESE AIR POWER IN WWII AND LESSONS FOR AUSTRALIAN MARITIME AIR EXPANSION



US Navy, Dock Landing Ship USS Whidbey Island by Michael Nitz

significant repercussions for IJN aviation by removing the inherent flexibility of a mobile concentration of aviation force, the placement of naval aviation forces at the behest of a separate command structure incorporating the Japanese Army had further significant impact on operations.

application of air power doctrine that is inherent to an air power specialist to take advantage of and develop Japan's extant aviation industry. In the words of Yamamoto, the decision to attack America was a total risk that accepted the possibility of total annihilation of Japan's military,<sup>10</sup> but the willingness to accept this risk was testament to the lack of strategic appreciation that allowed doctrinal and technological development (the capability edge) to cease.

### MAINTAINING A CAPABILITY EDGE

While the success of the initial IJN campaign rested on its capacity to project air power, the failure of doctrinal development affected the technological and training expansion required to sustain war beyond 1943. Although naval conflict between the IJN and USN was sporadic following the Battle of Midway, IJN defeats at Guadalcanal in November 1942, the Marianas in June 1944 and the Taiwan/Philippine defence of October 1944 reflected a growing technological gap between the opposing forces and facilitated American strategic bombing objectives to undermine Japanese industrial infrastructure.<sup>11</sup>

The Philippine engagement was of particular importance as IJN strategy involved drawing the USN into decisive fleet engagement through the sacrifice of remaining carrier assets, thus representing the final abandonment

of the air power strategy that had facilitated Japanese military successes.<sup>12</sup> This willingness to sacrifice lives was a trait of the Japanese *Bushido* military culture, and ignored greater strategic advantage in maintaining a Fleet in Being and organic air capability.<sup>13</sup> Specifically; whilst the IJN maintained a blue water aviation capability it still posed a threat to the USN Pacific advance, but in the absence of this capability the USN was afforded total freedom of action.

### LOSS OF ORGANIC AIR SUPPORT

Japan's defensive perimeter would have required at least three times the number of aircraft available in 1944 to adequately defend itself.<sup>14</sup> In the absence of this aviation force and carrier groups the IJN made a strategic decision in mid 1944 to remove aviation forces from sea based platforms to achieve localised support in defending critical island bases.<sup>15</sup> The result of this was twofold: in one instance the amalgamation of aviation assets, such as occurred in Taiwan at the beginning of October 1944, allowed USN Carrier strike groups the discretion of concentration of force to destroy the ground based aircraft in these locations.

Secondly, ground based aircraft became subject to the vagaries of tropical and island meteorological conditions resulting in a state of tactical impotence in poor weather. Although both these aspects had

### COMMAND AND CONTROL

Command integrity between the Japanese armed forces was very poor, and during the course of WWII, Army and Navy Chiefs of Staff would only meet on an *ad hoc* basis to discuss issues of mutual interest.<sup>16</sup> This arrangement reflects the disparate continental versus maritime strategies of 1941, but the requirement for the IJN to provide direct support to Japanese Army forces stationed in the Pacific defensive perimeter mandated a theatre joint command to ensure adequate utilisation of aviation assets. This arrangement was never established and resulted in a fundamentally different 'trend of thought' between Army and Navy commands, even when assets were co located on land.<sup>17</sup> For example, the Philippines Combined Base Air Force Commander (Vice Admiral Fukudome) attempted to coordinate aviation operations beyond the army centric tasking to 'drive back any attempt at landing by the enemy' in order to support IJN forces.

Unable to satisfactorily control army units, Fukudome was forced to turn 'a deaf ear to those requests [for maritime reconnaissance and strike] and decided that the best way protection [sic] I could give... would be to concentrate my entire air force in attacking [the USN] Task Force...'<sup>18</sup> Thus when these search assets were required by the IJN, inadequate command and control led to a critical breakdown in

aviation asset tasking and the promised concentration of aviation forces was never achieved due to inclement tropical weather.<sup>19</sup>

#### AUSTRALIAN MARITIME AIR POWER EXPANSION – LESSONS FROM THE JAPANESE EXPERIENCE

While the Japanese experience could be ignored by the ADF as lessons applicable only to a historical footnote of total war and national survival, it behoves air professionals to appreciate these factors as relevant when ADF material purchases such as the Landing Helicopter Dock (LHD) provide a capability to project battalion size army units and associated air assets, command and support staff beyond geo-strategic reach.<sup>20</sup> Even at the lowest level of the whole-of-government approach, Australian expeditionary doctrine must be developed as basis for regional engagement with a credible, protected force as a centrepiece for strategic options.

Like the Japanese in WWII, the

ADF has limited capability to rapidly expand material capability and asserts the assumption 'of support from allies and coalition partners in major conflicts.<sup>21</sup> Can the ADF always rely on coalition partners to provide and augment capabilities in a time of conflict? If not, is the ADF materially and doctrinally prepared to conduct expeditionary operations within range of an aggressive air power? Perhaps within this consideration is the pertinent lesson of the IJN and Yamamoto; that no one theory or military service is pre-eminent and that the judicious application and integration of joint doctrine and technologies (as follows) may be a formula for future military success.

#### TRAINING SYSTEMS

Current ADF policy as indicated by the whole-of-government approach dictates the utilisation of all aspects of Australian national power to counter state and non-state threats. Within this policy is the requirement to maintain a highly professional aviation force as part of a capability edge.<sup>22</sup> To

complement this, the ADF sponsors a highly selective aircrew training program that emphasises technical mastery as a core component of the mandate of professional mastery. While this system is deemed sufficient in regional non warlike and niche coalition operations, it ignores the critical vulnerability of maintaining a small professional workforce to the threat of attrition.

After Midway, the IJN capability edge of superior training and experience was subsumed by the inability to draw on professional reserves or an expanded training pipeline to provide workforce depth to sustain a cycle of operationally experienced aviators providing *ab-initio* training. To counter this, the ADF could consider sponsoring cadet style *ab-initio* training programs that would provide a pool basically trained reserve personnel that could be drawn upon to train to military requirement to increase the potential uniformed workforce available to the ADF at a time of crisis. Within this system would be a core of specialised aircrew who

could be retained outside of the military construct of promotion, posting and deployment cycles to augment instructors who have more recent operational experience.

Alternatively, Unmanned Aerial Systems (UAS) that bypass the extensive pilot training syllabus but still provide capability edge Intelligence, Surveillance and Reconnaissance (ISR) and strike capabilities could also mitigate the risk to ADF air power in a conflict of attrition.

*USS Essex conducts a beach landing rehearsal during Exercise Talisman Saber*





## *A CAUTIONARY TALE – FAILURES OF JAPANESE AIR POWER IN WWII AND LESSONS FOR AUSTRALIAN MARITIME AIR EXPANSION*

### **DEVELOPING JOINT AIR POWER PROFESSIONALS**

An important component of training systems is the ongoing development of post graduate professional knowledge.<sup>23</sup> Development of aircrew beyond operational flight training ensures that a comprehensive understanding of air power's characteristics, advantages and vulnerabilities permeates the ADF command chain at mid level and higher management. By removing a systemic frailty that is reliant on the personality and drive of the individual (such as Yamamoto), widespread understanding of doctrine and capabilities will ensure that 'the unique qualities of air power are effectively integrated into joint operations.'

At the level of capability development, professional masters can provide the advice required by government officials to make educated decisions regarding technology acquisitions and force development and employment. At the tactical level, developing an experienced cadre of aviation mission commanders who can apply their experience and status as warfare officers to integrate within a Joint Operations Command (JOC) and/or an afloat Air Operations Centre (AOC) will ensure that expeditionary command structures are fully cognisant of aviation capabilities.<sup>24</sup> With the advent of the LHD and proposal to utilise bespoke army and navy capabilities, the presence of experienced and articulate air power professionals can only facilitate ease of operations.

### **ORGANIC AIR AND TASK GROUP SURVIVABILITY**

Despite promoting a technological capability edge such as Early Warning (AEW) and ISR as a means of providing soft protection to ADF maritime forces, expeditionary operations can

be expected to be conducted outside of the effective operating range of land based strike assets. Use of this capability in this manner invokes high risk considerations that cannot be mitigated by current embarked aviation capabilities. If operations were countenanced against a credible air power, in order to avoid the defeat suffered by the IJN, doctrine must be developed to facilitate initial expeditionary operations to secure forward operating bases, or alternatively, a manned Short Takeoff Vertical Landing (STOVL) or reconnaissance/strike UAS must be procured to exploit the LHD 'ski ramp' configuration that can support a fixed wing capability.<sup>25</sup>

A fixed wing strike aircraft would provide a credible capability for afloat persistent effect through physical and virtual pressure that would augment a whole-of-government intent to meet the 'complex security challenges of the 21<sup>st</sup> Century.'<sup>26</sup> If these options are not countenanced, then the utilisation of the contemporary strike force of Hornets and Super Hornets, in flight fuelling and (eventually) AEW Wedgetails will limit the national strategy to low-end expeditionary deployment until embarked air power strike technologies are secured.<sup>27</sup>

### **CENTRALISED COMMAND AND CONTROL**

The limitations demonstrated by the Japanese WWII experience of disparate commands failing to adequately coordinate maritime air operations is a possible factor in future ADF operations. It is envisaged that within the LHD a deployable theatre command will be incorporated to provide 'an unprecedented level of command and control... through the onboard joint headquarters,'<sup>28</sup> but this will not be a permanently embarked capability.

Recognition of the critical interdependence of sea control and offensive air power to facilitate land operations is fundamental to successful expeditionary operations, so ideally Service integration should be established prior to operational requirements within an expeditionary doctrine that confronts a broad spectrum of threats and non warlike situations. The ideal of a seamless force would recommend the establishment of a permanent expeditionary command element at sea that would incorporate land, sea and air power professionals to avoid IJN related ignorance of air power tenets, establish an expeditionary professional experience cadre, and facilitate an immediate deployable capability for theatre air campaign planning.<sup>29</sup>

### **CONCLUSION**

The root cause of the Japanese defeat in the Pacific theatre extends to systemic failures that undermined any capacity to sustain a maritime war of attrition. The IJN air power failures of inadequate training regimes, professional/doctrinal development, technological capability, joint command and control and the resultant abandonment of embarked aviation capabilities damaged activities within a maritime theatre reliant on joint operations for successful defence.

For the ADF, the imminent technological and material expansion mirrors the development of the IJN experience and an appreciation of history can help avoid repetition of these errors. To achieve this, expeditionary air power must be wielded as part of a coherent national strategy that exploits the relative merits of ground and sea based maritime aviation. This will require recognition that, if the ADF assumes a mandate of expeditionary operations, air professionals must be integrated within

the development of this capability.

Defence of expeditionary units in hostile waters will challenge the ADF to develop systems that can provide sufficient aviation support required to fight in maritime warfare environment. In a region of escalating military technologies and capabilities, it behoves the ADF to ensure that vulnerable expeditionary units are deployed within a technologically advanced, well trained and integrated air power doctrine. ✎



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(Endnotes)

- 1 Originally submitted as part of the Advanced Air Power Course.
- 2 M, Ugaki, *Fading Victory: The Diary of Admiral Matome Ugaki, 1941-1945*, (Pittsburgh, 1991), pp. 49-50.
- 3 Royal Australian Navy, *The Navy Strategy: Charting the Course to 2025*, (Canberra, 2007), p. 19.
- 4 Air Power Studies Centre, *Japanese Air Power 1919-1945: A Study in military Dysfunction*, (digital resource, date accessed: 03 April 2008), p. 18.
- 5 O. Tagaya, 'The Imperial Japanese Air Forces', (Air Power Development Centre digital resource, date accessed: 03 April 2008), p. 193.
- 6 United States Strategic Bombing Survey (Pacific), 'Interrogations of Japanese Officials', (Naval Analysis Division, 1945, <http://www.ibiblio.org/hyperwar/AAF/USSBS/IJO/index.html>, date accessed: 13 September 2007) (Vice Admiral Fukudome), p. 519. Inadequately trained to the extent that during the period of Fukudome's tenure as Commander Second Air Fleet ashore in the Philippines, approximately 3000 aircraft were lost, the majority through misadventure directly attributable to poor training, 'the greater part of the total loss was traceable to other than air combat.'
- 7 S. Asada, *From Mahan to Pearl Harbor, The Imperial Japanese Navy and the United States*, (Annapolis, 2006), p. 281.
- 8 Asada, p. 184.
- 9 Tagaya, p. 181.
- 10 Asada, p. 282, also p. 289. Including warnings from IJN air staff commanders (the air power professionals) that they were 'not confident about war with the United States.'
- 11 D.C. James, 'American and Japanese Strategies in the Pacific War', in P. Paret (ed.), *Makers of Modern Strategy, from Machiavelli to the Nuclear Age*, (Princeton, 1986), pp. 713-717.
- 12 USSBS, op. cit., (Rear Admiral Takata) p. 265-266. Specifically they were to 'draw off Halsey's Task Force to the north even though defenceless under attack so that our own land-based planes could attack Halsey.'
- 13 Sea Power Centre – Australia, *Australian Maritime Doctrine*, (Canberra, 2000), p. 149. 'The use of options provided by the continued existence of one's own fleet to constrain the enemy's options in the use of his.'
- 14 USSBS, (Vice Admiral Fukudome), p. 523.
- 15 USSBS, (Rear Admiral Matsuda), p. 278. See also USSBS, op. cit., (Vice Admiral Fukudome) p. 507.
- 16 USSBS, (Vice Admiral Weneker (Kriegsmarine)), p. 285.
- 17 USSBS, (Vice Admiral Ozawa), p. 225. See also USSBS, op. cit., (Rear Admiral Takata) p. 264, 'Army and Navy forces were to cooperate as closely as possible; the air forces and the surface forces were to cooperate. No single control was erected, but close cooperation was made.'
- 18 USSBS, (Vice Admiral Fukudome),

p. 503. Citing differences in culture and terminologies with Army aviation, Fukudome notes the pinnacle of joint aviation operations in the Philippines as coordination of different takeoff times.

19 USSBS, (Vice Admiral Ozawa), 222-225. 'Lack of air power, I feel, was the weakest point. I knew in advance that lack of air power was the main drawback to the operation.' See also USSBS, op. cit., (Captain Ohmae), p. 160.

20 K. Gillis, 'Landing Helicopter Dock Project – Canberra Class', *Defence Today*, (Strike Publications, November/December 2007), p. 28. 'It will transform how the Australian Army deploys, how Army Aviation operates in the field, and how the Commonwealth Government thinks about deploying into our closer area of responsibility.'

21 Air Power Development Centre – Australia, *The Air Power Manual AAP 1000-D*, (Tuggeranong, 2007), p. 30.

22 APDC, pp. 96-101.

23 Organisations such as the School of Air Warfare are particularly committed to the development of post graduate professional development for tri-service aviation personnel through courses such as targeting and weaponeering that will augment a mandate to develop mission command excellence.

24 APDC, pp. 30-33.

25 Gillis, 'The fact is that we now have a platform that has a ski ramp and there is interoperability. It can be certified, it may happen [fixed wing capability] but it is not in the project task or contemplated at present.'

26 APDC, pp. 54-56 and 72-76.

27 A. Davies, *Issues for the Australian Air Combat Review*, (Australian Strategic Policy Institute, January 2008)

28 Gillis, 'An interesting division of tasking for one unit that raises the question as to the desirability to dual employ a C2 platform as the primary Amphibious Task Group asset.'

29 APDC, p. 24.

**A**RA LIBERTAD is a tall ship which serves as a school ship in the Argentine Navy. She was built in the 1950s at the Rio Santiago shipyards near Buenos Aires, Argentina. Her maiden voyage was in 1962, and she continues to be a school ship with yearly instruction voyages for the graduating naval cadets.



*The Argentine Ship ARA LIBERTAD (Armada de la República Argentina) pulls into the port at Garden Island, Sydney.*





# Finding The Lost Submarine: The Mystery of AE1

BY GRAHAM SEAL

*...Wrapped in the ocean  
boundless,  
Where the tides are scarcely  
stirred, In deeps that are still  
and boundless,  
They perished unseen,  
unheard ...*

FROM 'MISSING' BY WILL LAWSON,  
1914

The oldest mystery of Australian naval history revolves around the fate of submarine AE1.

Together with AE2 she was the first submarine to be purchased by the fledgling Commonwealth government and undertook a record-making voyage to Australia in 1914.

After arranging to return to port at Kokopo (then Herbertshohe) in New Britain on September 14, AE1's thirty-five officers and crew sailed into a sea mist and were never seen again. Since then there have been many speculations about her fate and a number of attempts to locate the wreckage. Forgotten though AE1 was in the ensuing events of the war, her brief life and the unexplained circumstances of her loss made an extraordinary impact on the Australian public and still have the power to move us today.

In December 1910 an Australian nation less than one-decade old, ordered two submarines from the Vickers Maxim shipyards at Barrow-in-Furness. These were to be boats of the British E class, their national designation heralded in the prefix 'A'. There had been a strong debate in Australian and British defence circles about the value of submarines and even a report recommending against their use. But after representing Australia at the 1907 Colonial Conference in London, Prime



Minister Deakin became convinced of their value and ignored the negative advice of Australian Naval Commandant Captain WR Creswell, who recommended the purchase of destroyers rather than submarines.

The Commonwealth government paid just over £105,000 for each boat, taking delivery from the builders in Barrow-in-Furness in January 1914. Six weeks later AE1 and AE2 were commissioned into the Royal Australian Navy, their 35-man crews having joined the boats early the same month.<sup>1</sup>

The E class submarines had been developed from earlier British designs, themselves based on the American Holland boats of the 1890s. After much technical and engineering experimentation, trial and error and some notable disasters, the submarine was just beginning to become a serviceable weapon of war, even though few people had any idea how they might best be deployed. The general seaworthiness and observational values of the two periscopes carried by the E class submarines, together with the

navigational bridge built over the conning tower made them ideal for patrol and reconnaissance work, the role in which AE1 was engaged when she disappeared.

At just over 54 meters, E boats were lengthier than most of their predecessors. They were also heavier but faster, able to achieve speeds of 15 knots on the surface and nine knots dived. Their propulsion depended on two six-cylinder diesels and two electric motors. They were armed with four torpedo tubes, one at the bow, one at the stern and two on the beam, providing the facility to fire at right angles as well as from the bow and stern.<sup>2</sup> Later E boats were fitted with deck guns, but AE1 and AE2 had none.

For the first time ever, these submarines were also fitted with gyroscopes and primitive Marconi wireless equipment, the aerial mounted on a wooden frame that was folded down when diving. Wireless had not been included in the original Australian specifications for the submarines. As a communications technology for submarines it was at

*AE1 leaving the  
docks in Barrow, UK.  
Photo courtesy HMAS  
Stirling*

the experimental stage, unreliable and dependent on a cumbersome and fragile wooden aerial mast that required lowering and raising whenever the craft submerged or surfaced.

The inside of these narrow machines was around seven meters wide and crammed with pipes, levers and torpedos. Officers and crews necessarily lived in close quarters in the cramped conditions, reading, playing cards and, on *AE1*, occasionally making music on a couple of concertinas.<sup>3</sup> Even with the necessary no smoking rule, the limited air quickly becoming polluted while underwater.

In these circumstances, leadership and morale were even more important considerations than usual and the commanding officers and crews were carefully chosen. English-born Lieutenant Thomas Fleming Besant, RN, became the commander of *AE1*, and Irishman Lieutenant Henry Hugh Gordon Dacre Stoker, RN, commanded *AE2*. Their crews were Royal Navy and Royal Australian Navy men, the senior sailors in particular selected for their

underwater experience through a rigorous training regime and need for high physical attributes.

Besant had joined the Royal Navy as a midshipman in 1898 at the age of 15. He saw action in China during the Boxer Rebellion and later became deeply interested in the development of submarines.<sup>4</sup> A Freemason, he was interested in horses, fishing and golf. He was redundantly described by the newspapers in Sydney as 'a clean-shaven young officer of youthful appearance'. If his other utterances were accurately reported, he was also an enthusiastic spokesman for the submariner's occupation:

'... it's not all beer and skittles and perhaps it is a harder life than in other branches of the service but it's the life I've chosen. Oh, yes, it's dangerous if you want to look at it like that but it's got to be done – and every man in the Navy, no matter in what branch he is in, has to be prepared to meet danger when it comes.'<sup>5</sup>

Besant was very young to be made Commander of the Australian

Submarine Squadron but had a reputation as a capable and cautious officer, suggesting he would have taken no unnecessary risks with his command. Like his First Lieutenant The Honourable Leopold Scarlett and 'Third Hand' Lieutenant Charles L. Moore, Besant was a single man.

The sister submarines began their pioneering voyage from England to Australia on the morning of March 7, 1914, escorted by the masted cruiser *HMAS Eclipse* built in 1894. They were still largely top-secret experimental craft, with the need for constant attention to defects and non-performing machinery. *AE1* had been subjected to balancing tests before leaving England, the results of which suggested that there may have been problems.<sup>6</sup>

*AE2* had many mishaps. Only three days from Portsmouth a blade fell off her port propeller and the starboard propeller suffered the same problem three weeks later. Even the spare propeller was found to be faulty, with a large crack appearing, it was mostly thought, from poor manufacturing techniques<sup>7</sup>. Officers and crew dealt with these

*AE1* with *HMAS Australia* and *HMAS Yarra* in the background, in September 1914 a few days before her loss—photo courtesy *HMAS Stirling* naval base





## *Finding The Lost Submarine: The Mystery of AE1*

problems with stoic inventiveness: 'Through a long list of mechanical difficulties and mishaps overcome by hook and crook, the miles were pushed astern, the weariness of it but lightly relieved by a few days in ports of call...', wrote Stoker Charles Suckling in his diary.<sup>8</sup> These incidents caused a great deal of practical difficulty, much paperwork and considerable repairing when the submarines reached Gibraltar late on 6 March.

They sailed for Malta on 9 March. *AE1* broke down during the voyage and had to be towed due to one of many malfunctions of the exhaust and intake valve springs, engine clutches, toggle bolts and overheating of the motor shaft and bearings that plagued the vessel. Three days later both submarines left Malta for a rough passage to Port Said. As the small convoy passed through the Suez Canal and the Red Sea, temperatures inside the submarines sometimes reached 100 degrees Fahrenheit (almost 38 degrees Celsius). *AE1* was painted white in an effort to reduce the heat.

An improvised but effective refitting of *AE2's* starboard propeller in Aden involved placing the anchor chains of *Eclipse* across the submarine's bow then the flooding the forward ballast tanks. This forced the stern to rise high enough for divers from the submarines' crews to fit the spare propeller, itself already

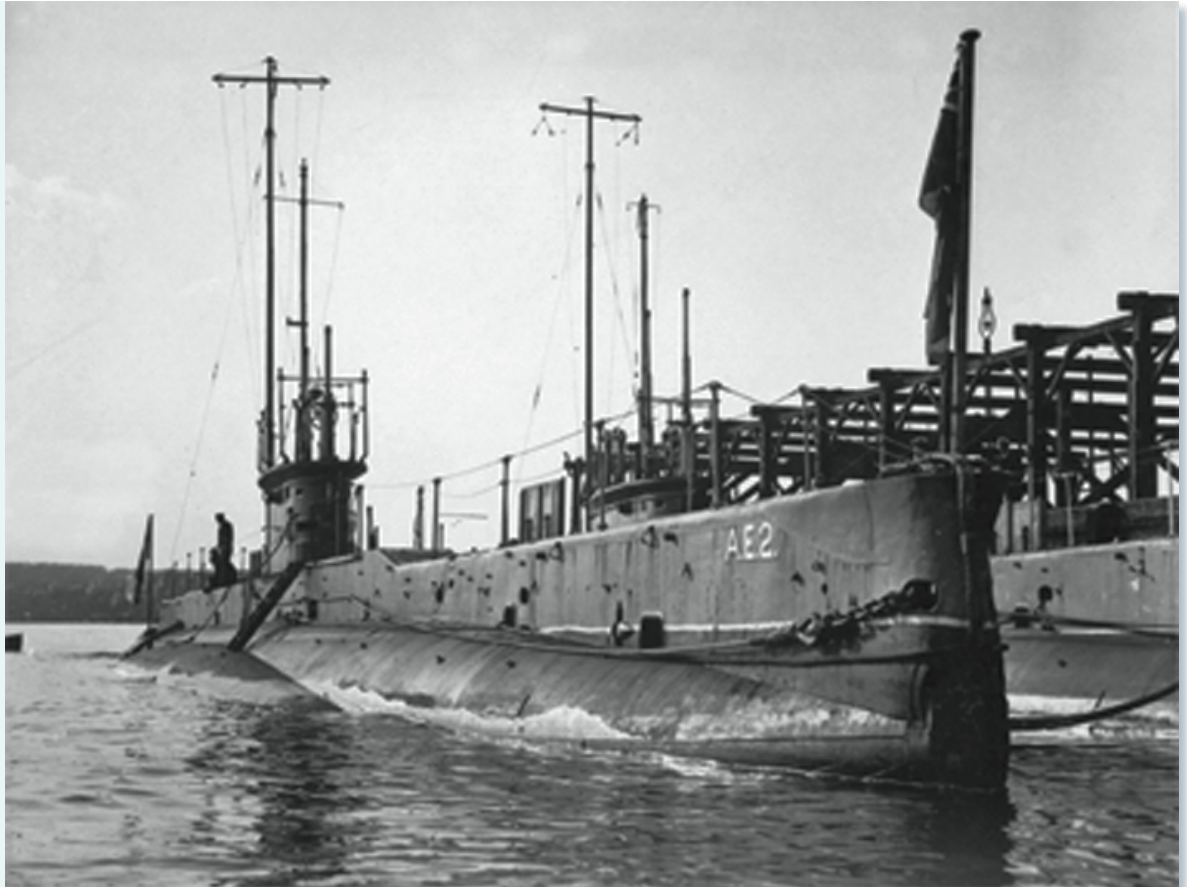
cracked.<sup>9</sup> The ships then made a good passage to Colombo where *Eclipse* was relieved by the Town-class light cruiser *HMS Yarmouth*. Partly under tow, *AE1* and *AE2* sailed to Singapore, meeting with their Australian escort *HMAS Sydney* on April 21. Conditions had improved little for the crew, as Engine Room Artificer John Marsland, later lost in *AE1*, wrote in his diary of the voyage: 'The heat in the submarine is now almost unbearable.'<sup>10</sup>

Unfortunately, the Royal Australian Navy had been ill prepared to host the novelty of submarines and there was no accommodation aboard *Sydney* for the submarine crews while in port, the men having to remain aboard their cramped and torrid craft. To make matters worse, *Sydney* coaled with poor quality fuel, her cinders and sparks blowing back onto the submarines under tow, causing discomfort and navigational difficulties. On April 25

they left for Jakarta (then still called Batavia). Here they were entertained by the Dutch authorities until their departure for Darwin on April 28.

While travelling through the treacherous currents of the Lombok Strait, *Sydney* and the submarines almost collided while *AE1* was under tow. An electrical problem aboard *AE1* jammed the rudder. The submarine began to yaw and her towrope parted, hampering *Sydney's* steering. *AE2* had luckily dropped astern of *AE1* and narrowly avoided collision with her sister submarine as *AE1* swung out of control. *AE2's* steering then jammed, almost forcing her aground. After restoring the helm, *AE2* moved ahead of *Sydney*, only to be almost run down by the escort as she struggled to remove *AE1's* broken tow-wire from her rudder.

With a triple disaster averted through astute seamanship aboard the submarines, they arrived safely



*AE2 with AE1 inboard at Garden Island (RAN photo)*

at Darwin on May 5. After two days that included 'a very large number taking advantage of the opportunity of landing on Australian soil for the first time'<sup>11</sup>, they left for Cairns where they spent five days, heading for Sydney on May 18. Following delays caused by bad weather and 'angry waves', as Marsland described them, *AE1* and *AE2* sailed through Sydney Heads at 6 in the morning of Empire Day – May 24 – docking at Garden Island. The two vessels had accomplished the longest submarine voyage ever undertaken. Even though under tow for around a third of the distance, they and their crews had covered almost 21 000 kilometres, 'a significant feat of seamanship and engineering'<sup>12</sup>, even acknowledged by the mighty London *Times*. Marsland wrote in his diary with a justifiable note of satisfaction that they had 'completed a most wonderful journey of endurance, both for men and engines.'<sup>13</sup>

Although the arrival of *AE1* and *AE2* in Sydney had been muted due to the delay and the fact that most residents were celebrating Empire Day, it was not long before the press and public became fascinated by these bizarre machines of the deep. No one was allowed aboard, as the submarines were still top-secret weapons. This simply made people inquisitive and the crowds came and stared anyway, their interest stimulated by the press reports, which played on the secretive aspects of the boats, as well as their unusual appearance and operation, with phrases and sub-headings such as 'strange looking craft and 'the Home of Secrets.'<sup>14</sup> Jules Verne's famous fantasy, *20 000 Leagues Under the Sea*, had only appeared in English for the first time in 1873, so the concept of living and travelling in a self-contained capsule beneath the sea

was still the stuff of science fiction for the general public.

As senior officer, Lieutenant Commander Besant was interviewed by the newspapers and seems to have become something of a minor media celebrity. Reporter for the *Sydney Morning Herald* wrote:

The submarines stood barely five feet above the waterline (save for the bridge and conning tower, rising some ten feet higher), and only a naval officer who has made a submarine his home and loves every bit of her, would contend that she's a lady, like 'the liner'. There are such men. You have only to talk to Lieutenant-Commander Besant, who has charge of *AE1*, for a few moments, and you discover it. It is nine years since he joined the submarine service, and he has lived a fair proportion of that time under water.<sup>15</sup>

The citizens of Sydney were greatly impressed by the arrival of these intriguing new craft in their harbour and provided their officers with a civic reception. There was patriotic applause when Besant stated that 30 of the submariners of *AE1* and *AE2* were Australian and that the submarines were important elements of Australia's naval defences. Officers and crew then enjoyed their first extended periods of shore leave, including beaches, clubs, sporting events and general socialising. Stoker, who liked to present himself as a 'philanderer', moved in more exalted social circles than did the submarine crews, or even Besant. He provides a vignette of the experience in his autobiography, *Straws in the Wind*, declaring Sydney 'the most attractive city to live in I have ever seen.'<sup>16</sup>

Two months later, *AE1* and *AE2*

were still being refitted from their record-breaking journey when war between Britain and Germany was declared on August 5 1914. Australian ships were tasked to attack Germany's East Asiatic Cruiser Squadron under the command of Vice-Admiral Count von Spee. The repaired submarines, with their parent ship *Upolo*, joined an Australian flotilla near Rabaul, New Britain (then the main island of what was German New Guinea) as part of the hunt for the enemy ships and the capture of Rabaul and the Bita Paka radio station. On 14 September *AE1* and *Parramatta* were patrolling together near Cape Gazelle in case von Spee's cruisers appeared. The ship and submarine – called a 'devil fish' by the indigenous Wirian people – were exchanging visual signals until shortly before *AE1* was last seen just before 3.30pm.<sup>17</sup> *Parramatta* returned to *AE1*'s last known position but did not sight the submarine. Assuming that *AE1* was returning to harbour as planned, *Parramatta* made for Herbertshohe, anchoring at 7pm.

An hour later *AE1* had still not returned and Australian Fleet Commander Rear Admiral Patey ordered a search for the missing submarine. *Encounter*, *Parramatta*, *Warego* and *Yarra* spent the next two days combing the area. *Yarra* damaged her propellers on a shoal in the poorly charted waters west of the primary Duke of York Island, further reducing the effectiveness of Patey's squadron. *AE1* was not found, nor was any wreckage and it was determined to convene a Board of Inquiry. For unknown reasons, though perhaps due to the urgency of the war situation, this was never held. Instead Lieutenant Stoker of *AE2* was asked for his expert opinions as to what might have happened. His

## Finding The Lost Submarine: The Mystery of AE1

speculations were contained in a report he made from Suva a month later. The possibility of enemy attack was dismissed, as was a breakdown leading to her being swept away. Stoker considered that the most likely causes of her disappearance were that she had either suffered a catastrophic mechanical failure while dived or had been wrecked on one of the many treacherous reefs in the area. In the absence of any further solid evidence, the speculations began and have continued ever since.<sup>18</sup>

In his diary, AB Wheat aboard *AE2* recorded that 'The cause of her disappearance is still a mystery' and also speculated along the same lines as Stoker's official report. Wheat, and probably his fellow crewmen, thought that *AE1* might have been sunk by an old tug armed with a five-barrelled Nordenfeldt gun. When the burnt-out and beached wreckage of this vessel was discovered it was thought that she might have surprised *AE1*, which had no deck gun. The possibility of a mine was discounted due to diligent sweeping of the area. Wheat included the suggestion that *AE1* may have overtrimmed due to having one of her motors disabled – 'that is had not buoyancy enough with her one remaining motor to give complete control and finally she had become unmanageable and sank.'<sup>19</sup> Given the troubled trimming procedures of *AE1* in England and *AE2*'s later stability problems in the Dardanelles, this is perhaps the most likely explanation for the loss of Australia's first submarine.<sup>20</sup>

The failure of the search to reveal anything of *AE1*'s fate hit the officers and men of *AE2* especially hard. Wheat wrote that it 'cast a great gloom over us as we all had friends who had gone and we were the only two submarines in Southern Waters.'<sup>21</sup> The Dedication that

prefaces his diary reads, in part:

'To the memory of our sister ship *AE1*, and her crew, Lost September 14<sup>th</sup>, 1914 in St. Georges Channel, between German New Guinea and New Ireland. We took the first patrol on the 13th, they took the second next day. We came back, they didn't. The path of our duty became the high-way of mystery for they never came back. They lie coffined in the deep, keeping their silent watch at Australia's North Passage, heroes all.'<sup>22</sup>

Similar speculations appeared in the Australian press. The *Sydney Morning Herald* published a not very accurate account from a 'special correspondent' in Rabaul:

The tragedy of the *AE1* is the first loss that the Australian Navy has sustained, and the magnitude seems all the grimmer for the atmosphere of mystery which surrounds it.

On the afternoon of 15th September the submarine was sighted off Gazelle Point, south of Herbertshohe, heading in the direction of Rabaul. She was never seen again.

A strange patch of oil floating on the quiet surface of the water, a nameless schooner, with a gun mounting from which the gun was missing, discovered on the coast in flames and sinking - these are the

only clues we possess to the manner in which the *AE1* came to her end, and they are by no means conclusive.

Whether she was actually sunk by a shot from the enemy, whether an unseen pinnacle of coral ripped open her plates, or the pumps refused to do their work in bringing the vessel again to the surface after a dive, will probably remain forever unknown.<sup>23</sup>

Other press reports reveal the impact that the loss of *AE1* produced. The *Sydney Morning Herald* of September 21 contained a lengthy account, together with the official statement on the incident and the Minister's Tribute. The Prime Minister's sympathies were extended and there were sections on the crew and officers, including Artificer Lowe and Commander (as he was styled) Besant. The section of the report detailing the history of the ill-fated submarine once again focussed on her top-secret nature.<sup>24</sup>

Far away in Western Australia the loss was hardly less muted. The *Western Mail* carried a photograph of *AE1* titled 'The Lost Australian Submarine'<sup>25</sup> and reprinted the expressions of sympathy and condolence from near and far, including those from New Zealand and from the Commanders in Chief of the East Indies and China. Also included was the official statement from the Navy Board, noting that '... although our men did not fall by the hand of the enemy, they fell on active service, and in defence of their Empire, and their names will be



enshrined with those of heroes.<sup>26</sup>

As well as a strong popular reaction to Australia's first casualties of the war, there was considerable dismay in official circles. *AE1* and her sister submarine had arrived in Sydney to some fanfare in the press and a great deal of community interest. Not only were they the country's first submarines, they were also tantalisingly top secret and, at the time, novel fighting machines. *AE1*'s disappearance caused an outpouring of public grief and commemorative activity. There were messages of sympathy from the King and Queen and from Winston Churchill in his role of First Lord of the Admiralty. The Royal Australian Navy produced a black-edged memorial booklet and special payments and arrangements were made for the wives and families of the officers and crew.<sup>27</sup>

It was a pre-radio and television age in which poetry was still an important form of public as well as private expression. A number of poems were composed in commemoration of the tragedy. Will Lawson (no relation to Henry Lawson) penned one simply titled 'Missing', published in the Victorian Education Department's *The School Paper*:

They heard no clamour of battle,  
No charging squadron's cheers;  
No murderous Maxim's rattle  
Was din'd in their dying ears;  
For wrapped in the ocean boundless  
Where the tides are scarcely stirred  
In deeps that are still and soundless,  
They perished unseen, unheard.  
O! brave are the heroes, dying  
'Mid thunder of the charge and gun;  
But our half-mast flags are flying  
For the crew of the *AE1*.

Lean hull through the light waves

leaping  
Afar o'er the seas she sped'  
Patrolling the long swells sweeping  
With the sunlit clouds o'erhead.  
One touch of the hand that steered  
her,  
She answered swift to her helm;  
Yet the scattered spray that cleaned  
her  
Could smother her and o'erwhelm.  
And, into the depths that bind her,  
She plunged with a swirling run.  
We may seek, but we shall not find  
her,  
Or the crew of the *AE1*.

The cruisers were dimly creping  
Like ghosts 'neath a dawnlit sky,  
Seeking, searching and sweeping;  
But the deeps made no reply,  
Hour after hour they waited  
For the lift of a conning tower,  
And a periscope that vibrated  
To her engines eager power,  
Or gleam of a white wake hissing  
In the rose of the rising sun.  
They have posted them sadly  
'Missing' –  
The crew of the *AE1*.

When Australia's brave sea story  
Is written and told, we know  
Their names will be lit with glory;  
And, wherever the six stars go,  
Wherever, with bugles blowing  
Australian flag shall wave,  
It will tell of a dark tide flowing  
O'er a lonely ocean grave.  
And the sound of women weeping  
For husband, lover and son,  
Shall stir them not in their sleeping –  
The crew of the *AE1*.<sup>28</sup>

Another poem on a similar theme,  
titled 'To the Men of *AE1* Entombed  
But Not Forgotten' by Del M'Cay  
appeared in the *Sydney Sun*.<sup>29</sup>

She faced no battle flame, she heard  
no German gun,

The ship without a name, the luckless  
*AE-1*.

Yet were her sailor's lives no less for  
Empire lost,  
And mothers, sweethearts, wives  
must pay the bitter cost.  
Australia's warships sweep the broad  
Pacific main,  
But one from out the deep will never  
rise again.  
Yet we shall not forget, through all  
the years that run,  
The fate that she has met - Goodbye  
to *AE-1*.

Pent in their iron cell, they sank  
beneath the wave,  
Untouched by shot or shell, they  
drifted to the grave.  
Until their painful breath at last  
began to fail;  
Upon their way to death let pity draw  
the veil.  
They could not strike one blow, but  
out of sound and sight  
Of comrade or of foe they passed to  
endless night;  
Deep down on Ocean's floor, far from  
the wind and sun,  
They rest for evermore - Goodbye to  
*AE-1*

A harder fate was their's than men's  
who fight and die,  
But still Australia cares, and will not  
pass them by;  
When Honour's lists are read, their  
names will surely be  
Among the gallant dead who fought  
to keep us free.  
Their winding-sheet is steel, their  
sepulchre is wide;  
Theirs is a Monument of History,  
begun  
When down to death they went -  
Goodbye to *AE-1*.

These expressions of grief and  
remembrance echoed the public  
shock at the loss of *AE1*, along with

## *Finding The Lost Submarine: The Mystery of AE1*

the concern in official circles. But the fate of the submarine and her crew would soon be forgotten by most as the even greater tragedies of the war unfolded. The lost submarine quickly faded from the pages of the newspapers and *AE1*'s sister submarine sailed to the Mediterranean. *AE2* became the first to 'force the Dardanelles', penetrating the Narrows section of the Dardanelles and entering the Sea of Marmara. Here she engaged Turkish warships and was eventually scuttled after being forced to surface due to unexplained trimming problems. Her officers and crew spent the rest of the war as prisoners of the Turks, four of them never to emerge from captivity. *AE2* first engaged the enemy at the same moment as the original Anzacs were landing at what has since become known as Gallipoli on the other western side of the Dardanelles peninsula. The Gallipoli campaign was a failure, but culminated in a triumphant withdrawal in December, 1915. The following year the horrors of trench warfare were taken to their worst level on the Somme and in subsequent actions involving Australian troops. In the mounting body count of World War I, the relatively minor disaster of *AE1* in a colonial sideshow to the main theatres of war was quickly forgotten by the public and by the government.

But not by the families and friends of the men of *AE1* nor by the Royal Australian Navy. In 1968, at the instigation of the then commander of the Australian Submarine Squadron, Commander W L 'Bill' Owen, RAN, a memorial plaque to the crew of *AE1* was presented to the War Graves Commission and located in Bita Paka War Cemetery, near Rabaul. This, together with a stained glass window commemorating *AE1* and *AE2* in HMAS Watson's Naval

Memorial Chapel, is the only tangible acknowledgement in the southern hemisphere of the sacrifice made by the men of *AE1*.<sup>30</sup> Unfortunately, the plaque was evidently prepared in haste, or perhaps from inaccurate information as it contains at least four and possibly more errors, including misspelling the surnames of crewmen Smail, Marsland and Hodgkin<sup>31</sup>.

A few years later John Foster, a RAN Commander, now retired, began a serious search for the lost submarine. Working in Papua New Guinea as a naval officer in the 1970s, Foster first heard that a local crayfish diver thought that he had seen a submarine on the sea floor. He obtained the official RAN files on *AE2* and was astounded to find that most of them had not been opened since 1919, and then only to make administrative corrections.<sup>32</sup> He managed to convince the Navy to allow him to make a side-scan sonar search from *HMAS Flinders* in 1976. A promising contact was made but was unable to be investigated. Subsequent publicity about the search resulted in a number of descendants of *AE1*'s crew contacting Foster and continuing to play a role in his quest.

In 1990 the famous undersea explorer, Jacques Cousteau, conducted another search for *AE1*. Once again, this provided a tantalising contact but nothing conclusive was found due to faulty equipment. Foster was not able to put another search expedition together until 2002. Having been firmly rejected by the Australian Government, he sought financial support from a documentary film company. Following up information gleaned from local divers, Foster and a party investigated a likely site near Milia Mission, Rabaul. Unfortunately,

sharks prevented a thorough survey of another promising feature. The following year, Foster tried once more but was again frustrated.

He and the documentary makers then managed to convince the Australian Broadcasting Corporation to fund an investigation of the most likely area for finding *AE1*. This expedition included marine archaeologist Jeremy Green of the Western Australian Maritime Museum whose experience with the high technology of modern wreck searches was invaluable. But yet again, the hopes of Foster and his collaborators were dashed as this expedition failed to locate the submarine.

Foster held further consultation with the Wirian people, which included his being initiated as an honorary clan member. The Wirian told him that they thought he was looking in the wrong place. Oral tradition and the experience of local fishermen dragging their weighted nets across a metal object on the bottom suggested that there was a wreck a little outside the area that Foster and his expeditions had already searched. Foster provided a GPS position in deeper waters off Mioko Island that he felt should be the datum for a further search which, as recommended by Jeremy Green, should be initially conducted by an aircraft fitted with a Magnetic Anomaly Detector, followed by an ROV or diver investigation.<sup>33</sup> It was also felt that an extended sonar and magnetometer search might also be fruitful.

In February 2007 *HMAS Benalla*, with Foster aboard, made a likely sonar identification of *AE1*'s last resting place. A man-made object of approximately the right size and shape was discovered at 65 metres in an undisclosed location.<sup>34</sup> There was

a flurry of renewed interest in *AEI* as newspapers and magazines around the world, as well as the Internet, reported the event. Foster and the Royal Australian Navy were confident that they had found a man-made object at a depth and location that fits with the known facts of *AEI*'s disappearance. A few months later, another attempt was made to identify the feature as the *AEI*. As the official press release from the Minister Assisting the Minister for Defence put it:

The Coastal Mine Hunter *HMAS Yarra* conducted a four day search using her mine hunting sonar, divers and the ship's camera fitted Remotely Operated Vehicle (ROV) to search a 50 sq km area around the position of the object identified by Benalla.

Unfortunately, once again the search was unsuccessful:

The object detected by Benalla's sonar was confirmed by the ROV camera to be a submarine shaped rock formation.

The crew of *Yarra* concluded the search with a memorial service for the men of *AEI*. In the press release the Minister Assisting reaffirmed the government's commitment to the search:

'The Government will continue to support the search for *AEI* if credible information about its likely location comes to hand. It is important to provide some comfort to the descendants of the brave crew of the *AEI*, who gave their lives in the service of their nation.'<sup>35</sup>

The search goes on. In the meantime, the fate of Australia's lost submarine

and her crew remains a mystery. But when *AEI* is finally found, it seems likely that her rediscovery will have as great an impact on the public as did her arrival in 1914. ✎



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#### Select References

- Brenchley F & E. *Stoker's Submarine*, HarperCollins, Sydney, 2001.
- Foster, J., *AEI: Entombed But Not Forgotten*, Australian Military History Publications, Loftus, 2006.
- Foster, J.D. 'Tom Besant where are you?' *The Mystery of HMA Submarine AE*. *Defence Force Journal*, No. 5, July/August 1977, pp. 19-23.
- Frame, T., *The Shores of Gallipoli*, Hale & Iremonger, Sydney, 2000.
- Green, J., *The search for the AEI: magnetometer and side scan sonar survey Duke of York Islands, East New Britain, 22-28 November 2003*, Report No. 174 Department of Maritime Archaeology, Western Australian Maritime Museum, 2003.
- Jose, A. W., *The Royal Australian Navy* (The Official History of Australia in the War of 1914-18, vol. 9), Angus & Robertson, Sydney, 1928.
- Marsland, J., *Diary, extracts reproduced in Naval Historical Review*, December 1974.
- Meade, K., 'Steel Tomb on the Ocean Floor', *Weekend Australian* March 10-11, 2007, p.29.
- Richardson, Peter at [http://www.aesubmarine.com/authors\\_notes.html](http://www.aesubmarine.com/authors_notes.html)
- Stoker, H., *Straws in the Wind*, Herbert Jenkins, London, 1925.
- Suckling, C., *Diary*, p. 4 AWM 3DRL6226.

Wheat, J. typescript *Diary AWM PRM F0026+3DRL/2965*

White, M., *Australian Submarines: A History*, AGPS, Canberra, 1992.

#### APPENDIX 1 - Technical specifications of E class submarines

Type: E Class Submarine  
 Displacement: 660 tons (surfaced), 800 tons (submerged)  
 Length: 181 feet  
 Beam: 22 feet 6 inches  
 Draught: 12 feet 6 inches  
 Builder: Vickers Ltd, Barrow-in-Furness, England  
 Laid Down: 14 November 1911  
 Launched: 22 May 1913  
 Machinery:  
 2 sets of 8 cylinder diesel engines, battery driven electric motors  
 Horsepower: 1,750 (surfaced), 550 (submerged)  
 Speed: 15 knots (surfaced), 10 knots (submerged)  
 Armament: 4 x 18-inch torpedo tubes  
 Complement: 35

#### APPENDIX 2 - The Crew of AE1

The pioneer submariners of this period were drawn from Australian and British backgrounds – and, in once case, New Zealand. Many had been in the Royal Navy, transferring to, or on loan to, the Royal Australian Navy, when joining the submarine crews. Others were Royal Australian Navy men. The exact proportion of British to Australian crew is unclear from official documents. According to the Director of Navy Accounts writing to the Director of the Australian War Memorial, of the 35 ill-fated crew of *AEI*, 10 were born in Australia, one in New Zealand and the remainder in England, Ireland or Scotland.<sup>36</sup> Other lists claim up to 14 were Australian-born. Besant was reported in the *Daily Telegraph* to have claimed that there were 30 Australian submariners among his men.

The confusion seems to have come about because some crew were British-born but serving (by transfer or on loan) in the Royal Australian Navy, see documents in Australian Archives (AAV - MP 472, DoN, cf, asns, 1911 - 1921, file number 16/14/4771, docket number 13/11747, 21.11.13).<sup>37</sup> At this period, most Australians considered themselves essentially members of the British Empire. The 'crimson thread of kinship,' as Henry Parkes colourfully described the links between Britain and Australia in his 1890 speech in support of federation, were at least as important as nationality; for many they were even more important. However, while nationality was then, as now, an emotive issue, it was not an issue in the designation of *AEI* as an 'Australian' warship, even though some doubt was apparently expressed, presumably by the British, in the late 1920s.

Following are the ranks, names, places of birth and designations of the officers and crew of *AEI*:



## Finding The Lost Submarine: The Mystery of AE1

Lieutenant-Commander Thomas Fleming  
BESANT England Royal Navy  
Lieutenant Charles Lewis MOORE  
Ireland Royal Navy  
Lieutenant The Honorable Leopold  
Florence SCARLETT England Royal Navy  
Petty Officer Robert SMAIL Scotland  
Royal Australian Navy  
Petty Officer Henry HODGE England  
Royal Navy  
Petty officer William TRIBE England  
Royal Navy  
Petty Officer Thomas Martin GUILBERT  
England Royal Navy  
CERA1 Thomas Frederick LOWE  
England Royal Navy  
CERA1 James Alexander FETTES New  
South Wales Royal Australian Navy  
CERA2 John Albert MARSLAND  
England Royal Navy  
CERA Joseph William WILSON England  
Royal Australian Navy  
ERA3 John MESSENGER Victoria Royal  
Australian Navy  
Leading Seaman Gordon COURBOLD  
New South Wales Royal Australian Navy  
Able Seaman John REARDON New  
Zealand Royal Australian Navy  
Able Seaman Jack JARMAN Victoria  
Royal Australian Navy  
Able Seaman Frederick William  
WOODLAND England Royal Australian  
Navy (ex RN)  
Able Seaman James Benjamin THOMAS  
England Royal Australian Navy (Ex-RN)  
Able Seaman Frederick George DENNIS  
England Royal Australian Navy (ex RN)  
Able Seaman George HODGKIN  
(should be HODGKIN, see Roll of Honour,  
Lenham (Kent) War Memorial at <http://www.roll-of-honour.com/Kent/Lenham.html>, accessed April 2007) England Royal  
Navy  
Able Seaman Arthur FISHER England  
Royal Australian Navy (Ex-RN)  
Signalman George DANCE England  
Royal Australian Navy (ex RN)  
Telegraphist Cyril Lefroy BAKER  
Tasmania Royal Australian Navy  
Chief Stoker Harry STRETCH England  
Royal Navy  
A/Leading Stoker Sydney Charles  
BARTON England Royal Australian Navy  
A/Leading Stoker John William MEEK  
England Royal Navy  
Leading Stoker William Elliott GUY  
England Royal Navy  
Stoker Petty Officer John Joseph  
MOLONEY (Spelled Maloney by White and  
Foster) Queensland Royal Australian Navy  
Stoker Petty Officer Charles Frederick  
WRIGHT England Royal Australian Navy  
(ex RN)  
Stoker Petty Officer William  
WADDILOVE Victoria Royal Australian  
Navy  
Stoker Percy WILSON New South Wales  
Royal Australian Navy  
Stoker John James (Jack) BRAY Victoria  
Royal Australian Navy  
Stoker Ernest Fleming BLAKE  
Queensland Royal Australian Navy  
Stoker Richard Bains HOLT England  
Royal Navy

Stoker James GUILD Scotland Royal  
Navy  
Stoker Henry Joseph GOUGH England  
Royal Australian Navy (ex RN)

### SOURCES:

Director of Navy Accounts to Director  
Australian War Memorial, Feb 22 1927,  
(6411), AA: MP 124/6 File No. 507/201/237  
Defence (Navy) Series 1923-1938; White,  
pp. 225-226; Foster, pp. 105-112; Roll of  
Honour, Lenham (Kent) War Memorial at  
<http://www.roll-of-honour.com/Kent/Lenham.html>

### (Endnotes)

- 1 Six extra crew were taken aboard each submarine to allow four instead of three watches, White, M., *Australian Submarines: A History*, AGPS, Canberra, 1992, p. 16.
- 2 See Appendix 1.
- 3 A possibly trying experience for other crew members; information from *Daily Telegraph* interview with Besant quoted in Brenchley F & E. *Stoker's Submarine*, HarperCollins, Sydney, 2001, p. 22.
- 4 Besant family history, quoted by Peter Richardson at [http://www.ae1submarine.com/authors\\_notes.html](http://www.ae1submarine.com/authors_notes.html), accessed March 2007.
- 5 *Sydney Morning Herald* September 21, 1914, p. 8.
- 6 See research notes on *AE1's* trimming and inclining experiments in December 1913, prepared by Peter Smith and drawn from Submarine Sketch Book No 4 by Mitchell, O J., Shipdraughtsman, Submarine Design Office, Admiralty, London, dated to 1918, Submarine Historical Collection, Spectacle Island. These tests showed problems with the 'Y' internal main ballast that may or may not have been subsequently corrected.
- 7 See Eken, J., 'Technical Detail of the E Class Submarine', Appendix 1 of White, p. 222.
- 8 Suckling, C., *Diary*, p. 4 AWM 3DRL6226.
- 9 White pp. 21-22.
- 10 Marsland, J., *Diary*, extracts reproduced in *Naval Historical Review*, December 1974. Marsland was on board *AE2* at this time, though was later lost with the *AE1*.
- 11 Marsland *Diary*
- 12 White, p. 25
- 13 Marsland diary quoted in *Naval Historical Review*, December 1974, p. 59.
- 14 *Sydney Morning Herald* May 25, 1914, p. 8.
- 15 *Sydney Morning Herald* May 25, 1914, p. 8.
- 16 Stoker, H., *Straws in the Wind*, Herbert Jenkins, London, 1925, p. 60.
- 17 There were suggestions of poor communication between ship and submarine due to strained personal and professional relationships and rivalries between the Royal Navy and the Royal Australian Navy, see copy of personal letter from Engineer-Lieutenant Alec B Doyle written aboard *Parramatta* on Sept 17, 1914

at [http://www.ae1submarine.com/authors\\_notes.html](http://www.ae1submarine.com/authors_notes.html), accessed March 2007.

18 See White, pp. 34ff and, chpts 8 and 9 and Foster, J., *AE1: Entombed But Not Forgotten*, Australian Military History Publications, Loftus, 2006, chpts 8 and 9. Peter Smith, Honorary Curator of the Spectacle Island Submarine Archives points out, *AE1* was carrying several more engine room crew than usually required at the time of her disappearance, suggesting some serious problems in this area. Personal communication January 2007. Even Stoker was still undecided about the fate of *AE1* when he published his autobiography, *Straws in The Wind*, a decade later, pp. 64-67.

19 Wheat, J., typescript *Diary AWM PRM F0026+3DRL/2965*, p. 5.  
20 E class submarines were very much works in progress and developed rapidly throughout the war with over fifty being built at a variety of British dockyards. It is possible that the first two suffered more design, construction and operational problems than the remainder, most of which seem to have been considered as reliable and effective as the technology of the time could provide. Only a few E boats were lost in undetermined circumstances.

- 21 Wheat p. 5. (original caps).
- 22 Wheat, Dedication.
- 23 *Sydney Morning Herald*, September 27, 1914.
- 24 *Sydney Morning Herald*, September 21, 1914, p. 8.
- 25 *Western Mail* September 25, 1914, p. 28.
- 26 *Western Mail*, September 25, 1914, p. 45.
- 27 Australian Archives MP472/1, 3/14/8389, 1914-1914.
- 28 *The School Paper*, No 181, Nov. 2, 1914.
- 29 *Sydney Sun* Sept 23, 1914. Also found in diary in possession of H. Willis, 54 Denman Avenue, Lakemba, NSW, Australia with transcription by Peter Richardson at [http://www.ae1submarine.com/authors\\_notes.html](http://www.ae1submarine.com/authors_notes.html), accessed March 2007.

30 It seems not to be widely-known that they are also commemorated in the Royal Naval Memorial at Portsmouth, dedicated to all those World War 1 and 2 sailors who rest in unknown graves beneath the waters of the world.

31 J A Marsland appears as 'Mareland'; R Smail appears as 'Snail', J J Maloney appears as 'F', (his surname may also be misspelled, see Director of Navy Accounts to Director Australian War Memorial, Feb 22 1927, (6411), AA: MP 124/6 File No. 507/201/237 Defence (Navy) Series 1923-1938) and G Hodgkin appears as 'Hodgskin', though it appears that there may have been an attempt to remedy this. These observations have been made from photographs of the plaque and there may be other discrepancies. A thorough check of the relevant primary source records may ascertain the correct details. See also mention of repair work to the memorial in

DVA—Annual Reports 2003-2004 — Annual Report of the Department of Veterans' Affairs Output 3. War Graves at [http://www.dva.gov.au/media/aboutus/annrep04/ar\\_dva/outcomes/outcome03\\_02.htm](http://www.dva.gov.au/media/aboutus/annrep04/ar_dva/outcomes/outcome03_02.htm)

32 Foster, p. 52. Peter Richardson, brought up in Rabaul, also made efforts to locate *AE1* in the 1990s, but was hampered by volcanic activity in the area. Peter Richardson at [http://www.ae1submarine.com/authors\\_notes.html](http://www.ae1submarine.com/authors_notes.html), accessed March 2007.

33 See Green, J., *The search for the AE1: magnetometer and side scan sonar survey Duke of York Islands, East New Britain, 22-28 November 2003*, Report No. 174 Department of Maritime Archaeology, Western Australian Maritime Museum, 2003.

34 Report by J Foster to Commodore RJ Griggs RAN Deputy Fleet Commander Maritime Headquarters, March 8, 2007. See also ABC TV 'Foreign Correspondent' segment 'The Hunt for the AE1' March 27, 2007.

35 024/2007 Wednesday, 30 May 2007, media release from Minister Assisting the Minister for Defence 'LOCATION OF AUSTRALIAN WWI SUBMARINE STILL A MYSTERY'.

36 Director of Navy Accounts to Director Australian War Memorial, Feb 22 1927, (6411). This document was produced to refute apparently extraordinary claims that there were no Australians aboard *AE1* and *AE2*.

37 Peter Richardson at [http://www.ae1submarine.com/authors\\_notes.html](http://www.ae1submarine.com/authors_notes.html), accessed March 2007.





*HMAS Stuart arrives home to Garden Island, Fleet Base East, Sydney, after a six-month deployment to the North Arabian Gulf.*



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# Visions from the Vault

## Visions from the Vault

### Visions from the Vault



*HMAS Pioneer's* wartime career was one of the more interesting in the early RAN.

Deployed from Australia at the Admiralty's request the small cruiser arrived at Mombassa on 3 February 1915. There she joined with British forces maintaining a close blockade of German East Africa. These patrols not only aimed to prevent supplies from reaching the German forces ashore, but also served to neutralise the enemy cruiser, *Konigsberg*, which had taken refuge up the Rufiji River beyond the range of effective fire from the sea.

*Pioneer* intercepted and sank a few dhows, but the stand-off with

*Konigsberg* continued until July when the arrival of two shallow-draught but heavily-armed river monitors allowed the British to destroy the German vessel at extreme range.

*Pioneer* remained on station enforcing the general blockade of the German colony, and in 1916 took part in several shore bombardments in support of the Allied advance ashore. Her last action was in July, by which time the Germans were being driven inland, and the unlikelihood of their receiving support from the sea allowed a reduction in the coastal patrol.

*Pioneer* returned to Australia in October 1916 having fired more main

armament ammunition than any other RAN warship during the course of the war. As this photograph shows, *Pioneer* evidently employed some local labour during her time on patrol, but the specific nature of the tasks they were expected to perform remains unclear. The original caption reads 'Seechi boys. *HMAS Pioneer*' and from the smart fit of their uniforms one might surmise that these were personal issue items and not simply donned for the occasion. The black sash worn around the waist appears to be a feature unique to this group. ↗

## Book Reviews



### **Mururoa Protest - The story of the voyages by HMNZ ships Otago and Canterbury to protest against the French atmospheric nuclear tests at Mururoa Atoll in 1973**

ISBN 978-0-473-13178-4

By Gerry Wright

Reviewed by CDR Greg Swinden

As the old saying goes 'Don't judge a book by its cover'. This history of the New Zealand Navy deployments to Mururoa Atoll to 'protest' against the French nuclear testing that took place in July/August 1973 looks, on face value, to be a somewhat 'scruffy' paperback written by a retired naval officer. Not until you have finished the last page do you realise that the author has provided one of the very few public views of a virtually unknown period in New Zealand, and Australian, naval history. He also provides some candid views on the command and control, planning, training and media aspects of the deployments as well as an insight into life at sea in a now bygone era.

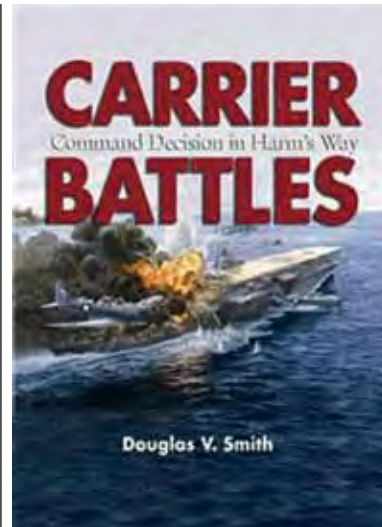
Gerry Wright, a former naval officer and Operations Officer in

*Otago* during the ship's deployment to Mururoa, has written this book based upon personal reflection and access to declassified Defence documents. The deployment of both New Zealand frigates was supported by the RAN who stationed the tanker *HMAS Supply* near Rarotonga which enabled the frigates to remain poised off Mururoa for many weeks. The unsung supply of Furnace Fuel Oil, provisions, stores and mail enabled the New Zealand plan to oppose the testing to become a reality.

Interestingly the US, Russian, Chinese and British Governments also stationed ships in the area to observe the tests and in the case of the British to be also ready to evacuate British subjects from Pitcairn Island in case of fallout reaching the island. Additionally the embarking of civilian media representatives and a New Zealand cabinet minister in the RNZN ships to provide direct communication with the New Zealand media and Government was perhaps the first time this type of event had occurred.

The 248 page, paperback book is reasonably well illustrated with black and white photographs (although some are of very poor quality) and despite its somewhat rambling style at times it is still a good read. Strongly recommended for those interested in RAN/RNZN history or staff officers, as it is a good example of 'if you want a new idea then read an old book', or in this case a new book about old ideas.

*Mururoa Protest* is available from the author [gerrywright@xtra.co.nz](mailto:gerrywright@xtra.co.nz) for \$25.00 (NZD) and \$10 postage to Australia. Gerry is also the author of two other books on New Zealand naval history *being A Kiwi on our Funnel* (the story of two RNZN ships during Confrontation in 1965-66) and *We were There* (the story of RNZN involvement in British nuclear testing off Christmas Island in 1957).



### **Carrier Battles — Command Decisions in Harm's Way**

By Douglas V. Smith

Hardcover; 352 pages, includes 44

Line Art Drawings: 44

Total Number of Illustrations: 44

Published by the United States Naval Institute: \$34.95US

Reviewed by LCDR Bradley Smith

*Carrier Battles* is a book that has been written for those who have an interest in both US Naval history during WWII, and the art of decision making and influence of officer training on those decisions. The author has attempted to analyse the key carrier battles during this period to demonstrate that superior training produced by the US Naval War College enabled the US to overcome a Japanese naval force initially greater in both number and technological capability.

The book is a good read for those who simply wish to gain a greater understanding of the scale of the numerical advantage that the Japanese had at the beginning of this period, and



the success of the US in battles against these forces. Detailed descriptions of the events and outcomes of each battle, including detailed tactical charts, and statistical tables of each force, are included. As the title suggests the book describes the major carrier battles of the Pacific (Coral Sea, Midway, Guadalcanal, Santa Cruz, and the Philippine Sea). Whilst this is interesting in itself the focus is on the method and thought process of each commander's decision making to shape and ultimately win these battles.

The book does not develop the individual characters or stories of heroism that are encountered in many other titles written about the largest naval campaign seen to that date and after. It also provides only limited insight into the decision making process of the Japanese officers during these battles. This is a book focused on analytical assessment of the US Naval commanders who achieved extraordinary success, and on how that success was derived from their officer training.

*Carrier Battles* provides great insight into the performance of commanders in battle and how their training shaped their decision making and tactical thinking. A recommended read for those wanting to gain a greater understanding of the importance of making sound military decisions under pressure, and of the value which a professional military education can provide.



*HMAS Collins launches a flare as it moves past Singaporean Victory Class Missile Corvette, RSS Vengeance*



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## ANI On-line: A guide to the new website.

*Our new website is now on-line! In addition to the features available on the previous site, the new site also features a library of past journals, a discussion forum, a news section and member list. This short guide is designed to help you take full advantage of the new features.*

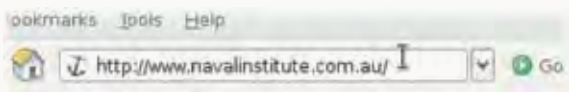


Figure 1

### OBTAINING AN ACCOUNT

In order to access the new features of the site you must have a user account for the website. If you have a current subscription to the ANI, navigate to the website [www.navalinstitute.com.au](http://www.navalinstitute.com.au) using your web browser (figure 1), click the “Members Login” menu item (figure 2), then click the link to download an application form. Fill in the form, then fax or post it to the ANI Business Manager. Once your account has been created, you will receive an email that outlines your member ID and password.

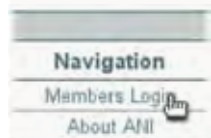


Figure 2



Figure 3

### LOGGING IN TO YOUR ACCOUNT

Once you have your account details, you are ready to login and access the new features of the site. In order to login, navigate to the website (figure 1) and click the “Members Login” item (figure 2). Enter your member ID and password as they were provided to you, then click the “Login” button. The case of the member ID and password are important: i.e. “CaSe” and “case” are considered entirely different words by the authentication system. Each letter of the password will appear as a single “\*” to prevent others from seeing your password as you type. If you have entered your details correctly, you will be presented with the news page. The grey status bar at the top notifies you of the account you are using (figure 4). You are now able to access all of the new features of the site.



Figure 4

### LOGGING OUT OF YOUR ACCOUNT

In order to protect your identity and to prevent malicious use of your account by others, you must log out of the site when you are finished browsing. This is especially important on public computers. In order to log out, click the “Logout” link in the grey status bar (figure 4).

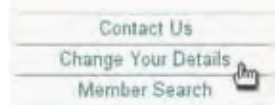


Figure 5

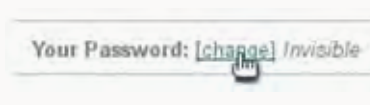


Figure 6

### CHANGING YOUR DETAILS

When your account is created, only your member ID and password are stored in the system for privacy reasons. However, you may provide other details that are visible to other ANI members. In order to change your details, login and click the “Change Your Details” menu item (figure 5). Then select the “change” link (figure 6) next to either your personal details or password. Change the text appropriately and click the “save” button (figure 7).

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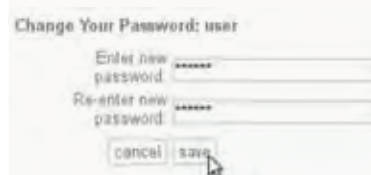


Figure 7

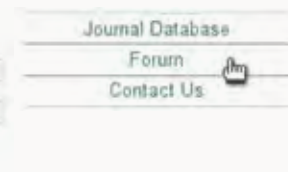


Figure 8

### PARTICIPATING IN THE FORUM

In order to post topics and replies in the discussion forum, first login and click the “Forum” menu item (figure 8). Then select a forum that you would like to view by clicking its “View Topics” button (figure 9). Select a topic that you would like to read by clicking its “View this topic” link (figure 10). If you are not interested in any particular topic, you may add your own by clicking the “Add New Topic” button (figure 10). Similarly, once you are viewing a topic, you may post a reply by clicking “Add New Post”. Fill in the heading and body of your reply and click the “Submit” button to add your reply to the topic. If you change your mind while writing your reply, you may click the “Cancel” button and your reply will not be added to the topic.

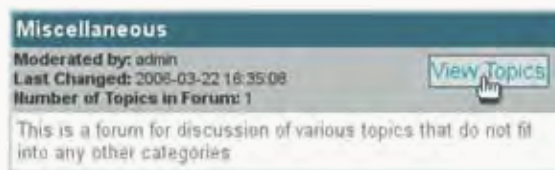


Figure 9

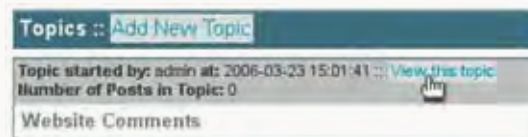


Figure 10

### FURTHER QUESTIONS

If you have specific questions regarding website features or even a feature request, post a topic in the “Website Questions” forum and a site administrator will reply. Otherwise, happy browsing!

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