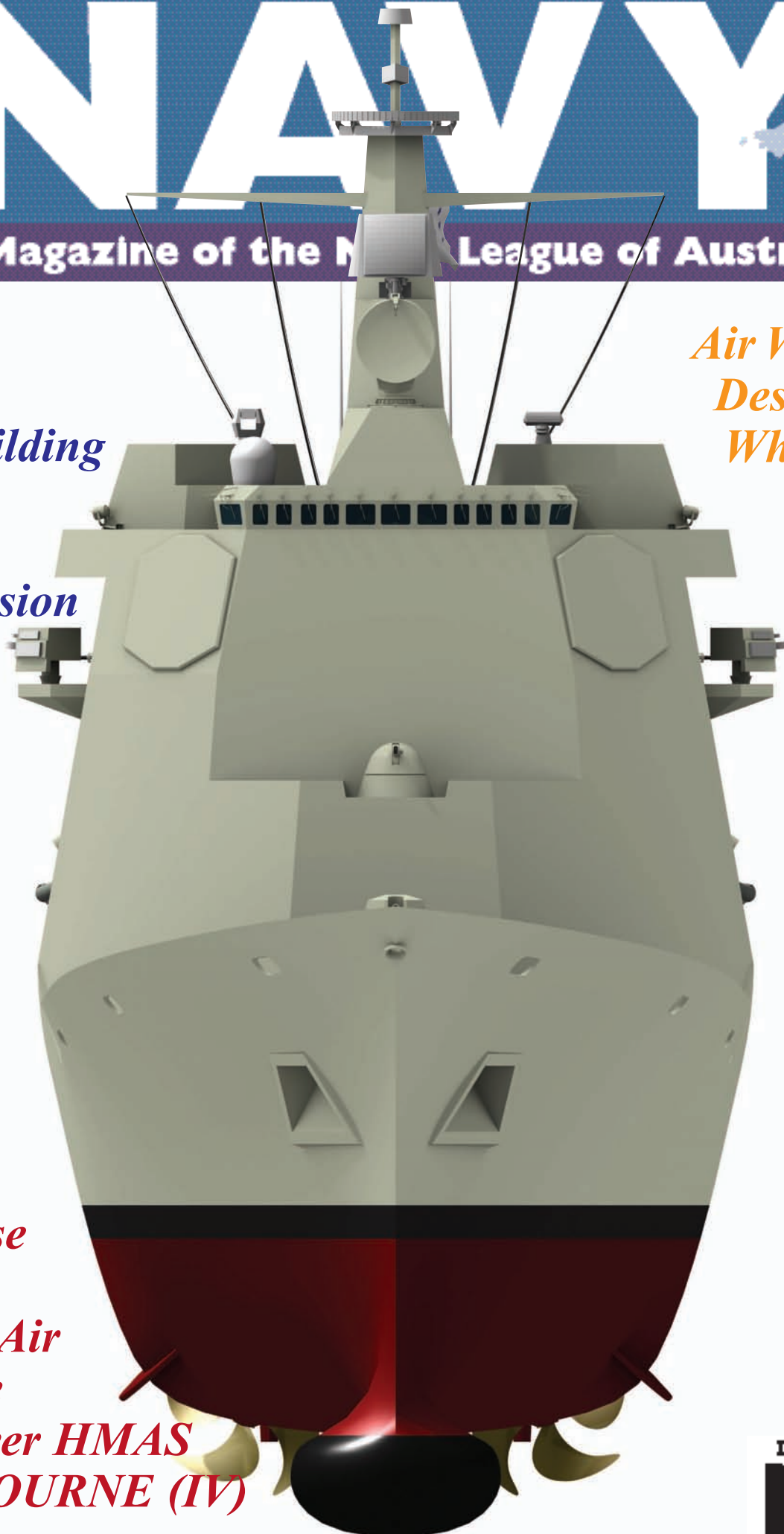


# THE NAVY

The Magazine of the Naval League of Australia

*Naval  
Shipbuilding  
League  
Senate  
Submission*

*Air Warfare  
Destroyers  
Why They  
Matter*



*The case  
for the  
Fourth Air  
warfare  
Destroyer HMAS  
MELBOURNE (IV)*

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# THE NAVY

Volume 68 No. 4

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**Front cover:** The Gibbs & Cox design for the new Air Warfare Destroyer contract to build three Hobart class destroyers in South Australia. (Gibbs & Cox)

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## More Destroyers!



An Israeli Saar 5 class corvette. Since the attack HANIT has been repaired and is back at sea.

On the evening of 14 July at 20:15hrs local time the Israeli Navy discovered that complacency in a battle zone cannot be mitigated against when using small warships. Their Saar 5 class corvette, INS HANIT, was 16kms off the Lebanese coast performing the role of joint task force C2 (Command

and Control) when struck by an ASM (Anti-Ship Missile), not thought to be in the Hezbollah's arsenal.

HANIT was leading a group of small ships blockading the Lebanese coast. The C2 role she was performing involved providing separation and direction to friendly air and naval units. This would normally be undertaken by a much larger warship, given it has more combat information workstations and more crew to handle the workload, while still enabling the ship to act offensively. The proximity of these other ships meant HANIT had turned her defensive systems off for fear of accidentally engaging a friendly unit.

During the execution of this role HANIT was fired on by two Iranian copies of the Chinese C-802 ASM, known as the Noor. The first passed over HANIT and proceeded 60kms out into the Mediterranean hitting and sinking a Cambodian flagged freighter. It is widely believed that this first high flying ASM was a decoy to divert attention away from the second which was approaching at wave top height. This second ASM hit HANIT in the stern section. It is believed the warhead failed to detonate but the damage and subsequent fire killed four crew and saw the helicopter pad ultimately cave in. Despite the hit, HANIT was eventually able to make her own way to port.

The all-encompassing C2 task she was performing may have been one of the reasons that affected her ability to detect the attack and react to it, that and the short range of the

engagement which probably meant the missile was in the air for less than a minute. To put it frankly, small ships cannot do big ship jobs and expect to get away with it. But one of the most telling indictments was the admission from the Israeli Navy that they were not prepared for such an attack. They believed Hezbollah did not possess ASMs or the tactical proficiency to use them. This complacency was probably the main reason the missile was able to score a hit on the HANIT.

The Saar 5 class was designed from the outset to operate in an environment rich with ASMs. Not only is it a very stealthy design (somewhat negated in this case by its proximity to the ASM launcher) but also has numerous electronic jamming systems and point defence weapons to shoot down incoming missiles. Luckily HANIT's damage control design and automatic fire fighting features came to the fore and saved her from destruction.

In one respect the Israeli Navy's assumption of Hezbollah was perhaps correct. Hezbollah probably didn't possess this capability. The tactics used to hit the HANIT display a level of expertise not usually associated with a land based terrorist/guerrilla organisation. To employ such a weapon and tactic one would require a deep technical understating of ASM defences and how they work.

In its land based configuration the C-802 is not an easy weapon to use. It requires three six-wheeled trucks, one for radar/command, another for power generation and a launcher truck. As Hezbollah's main opponent has always been the Israeli Army someone else may have been behind the attack on the HANIT.

From a geo-political point of view one has to suspect Iran as the mastermind of the recent Israel-Hezbollah conflict. Hezbollah has always been a proxy for Iran and used by Iran to divert attention or create pressure during periods advantageous to it. Consider this, at a time when the UN was considering sanctions against Iran over its nuclear ambitions the fighting in Lebanon started. Coincidence? An Iranian anti-ship missile was used to attack HANIT with obvious technical and tactical proficiency beyond Hezbollah. Iran has also been 'stirring the pot' with regard to its nuclear ambitions. All of this forced the price of oil up. Coincidentally, Iran is a major oil exporter and is reaping a huge profit from the Middle East Turmoil it has caused.



(From left to right) The radar/command truck needed to launch the C-802 (Noor) missile with the launcher vehicle (right). Missing is the third power generation truck needed to operate the missile in the land based configuration.

The RAN is currently maintaining a presence in the Persian Gulf (at the time of writing HMAS WARRAMUNGA had deployed). To do this its ships have to pass within sight of Iran through the natural choke point entrance to the Persian Gulf. With such a belligerent country having developed tactics to try and counter some of the best ASM defences on the market the RAN must surely be considering further upgrades to our ships, as well as implementing doctrine and procedures to counter any potential complacency.

Naval operations in far off regions against capabilities such as these were never imagined by Defence strategic planners in 2000 when they published the last White Paper. Thus, in this issue we encourage Government to consider an additional Hobart class destroyer, which can more safely operate in regions such as the Persian Gulf against states like Iran, or their proxies.

Deploying a ship that is more than capable of defending itself while conducting other missions in unexpected and ambiguous situations would be an attractive political option for

our casualty averse society. Recent deployments by Australian Special Forces and Armoured units to Afghanistan, Iraq and more recently in East Timor would indicate that the Government is deliberately using forces that are highly capable in combat given their enhanced ability to fight, and thus survive. The three Hobart class destroyers will be the RAN's most powerful, versatile and survivable units making them politically attractive and thus in demand, particularly if the last 15 years of naval operations are any indicator. So a fourth may certainly be warranted.

The Government recently approved another two battalions of infantry for the Army based on its operational tempo and the perceived future threat. What seems to be forgotten is that Navy has usually been taking and supporting Army in these operations, on top of its other national security tasks. With the precedence having been set for Army, Navy should be asking government 'why not a fourth Hobart class destroyer'? This, incidentally, would cost less than raising two more battalions.

*By Themistocles*

## FROM OUR READERS

Dear Sir,

On the inside cover of Volume 68 No.3, there is a statement as to why NUSHIP PERTH's Mk-45 Mod 2 gun has a non-stealth shield and implying that 'the dockyard' (Tenix) did the training for the system.

If you go to [www.lopac.com.au](http://www.lopac.com.au) 'Support and Training' and 'Mk 45' you will see that LOPAC conceived, developed and operated the ANZAC Ship Ordnance Support & Training Centre (OSTC) from 1994 to 2005. The Mk-45 Mod 2 gun mount in the OSTC (and now in NUSHIP PERTH) and the MK-41 VLS (also now in NUSHIP PERTH) were fully operational and functionally connected to an ANZAC fire control system some 500 metres away by fibre optic cable.

This set up was unique in the world. With the training of NUSHIP PERTH's crews in early 2005, the OSTC ceased to function and continuation training is being established in HMAS STIRLING by the RAN.

Yours,

CMDR Stephen Youll OAM RAN (Rtd)

Managing Director

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Notice is hereby given that the  
**ANNUAL GENERAL MEETING**  
of  
**THE NAVY LEAGUE OF AUSTRALIA**  
will be held at the Brassey Hotel, Belmore Gardens, Barton, ACT  
**On Friday, 13 October 2006 at 8.00 pm**  
**BUSINESS**



1. To confirm the Minutes of the Annual General Meeting held in Canberra on Friday 14 October, 2005
2. To receive the report of the Federal Council, and to consider matters arising
3. To receive the financial statements for the year ended 30 June 2006
4. To elect Office Bearers for the 2006-2007 year as follows:
  - Federal President
  - Federal Vice-President
  - Additional Vice-Presidents (3)Nominations for these positions are to be lodged with the Honorary Secretary prior to the commencement of the meeting.
5. General Business:
  - To deal with any matter notified in writing to the Honorary Secretary by 3 October, 2006

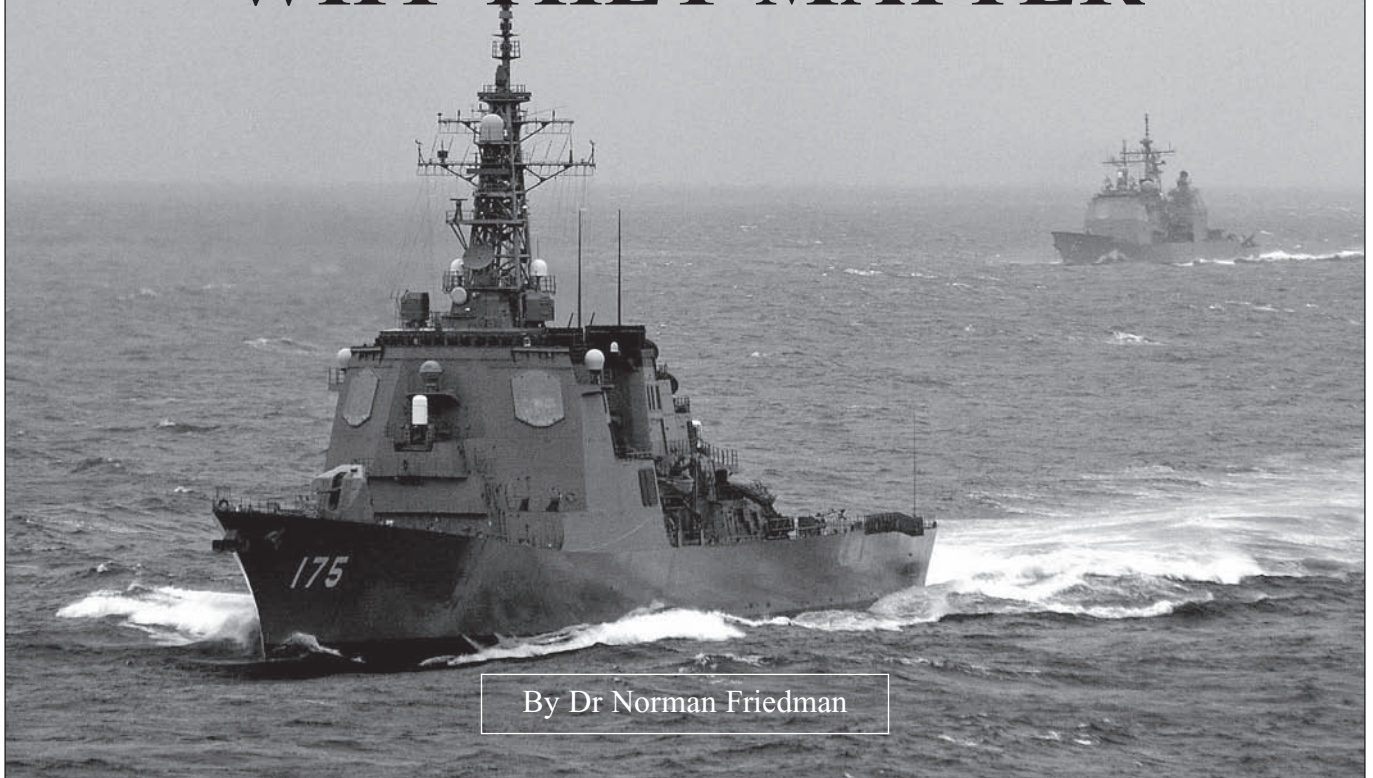
### **ALL MEMBERS ARE WELCOME TO ATTEND**

By order of the Federal Council

Ray Corboy, Honorary Federal Secretary, PO Box 2063, Moorabbin VIC 3189

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# AIR WARFARE DESTROYERS WHY THEY MATTER



By Dr Norman Friedman

The Japanese air warfare destroyer MYOKO in company with the USN Ticonderoga class cruiser USS SHILOH. Both ships employ Aegis and SPY-1 making them specialists in the anti-air domain but also at command and control for joint task forces. Japan is one of 10 countries who have invested in air warfare destroyers. (USN)

**World renowned naval affairs commentator Dr Norman Friedman takes a refreshing look at the reasons and history behind the advent of the modern air warfare destroyer (AWD), including some of their characteristics and advantages. With Australia set to finally go down the AWD path the article serves as a reminder as to why they matter.**

The Royal Australian Navy is currently planning to buy Air Warfare Destroyers to, in effect, replace the three discarded *Adams* class bought from the United States in the 1960s. In fact they will be living in a rather different strategic environment, facing a different threat, and they will embody rather different technology. Many other navies have built or are buying comparable ships.

First, the environment. The *Adams* class were conceived as carrier escorts. The RAN bought these ships in preference to the radically modified British 'County' class it initially envisaged. In either case, the most important feature of the ship was its anti-aircraft missile system, which was expected to operate synergistically with carrier fighters, mainly as a backstop. The fighters are expected to take on the enemy bombers outside missile attack range, thus dramatically reducing the scale of the missile attack which the defended group has to counter. This dilution reduces the attack to what the ships can counter. The fighters have a wider role. If the bombers attack with stand-off weapons, often only the fighters can kill them outside dropping range. Without the fighters, the bombers can drop their weapons and return to attack again and again. Even if the ships deal with the first wave of missiles, ultimately they run out of defensive weapons. For example, the

*Adams* class carried 40 missiles, and doctrine was to fire two, evaluate success, and then fire again. The reason was simple. Because no one would credit a defensive missile with better than a 50-50 chance of success, at least two had to be assigned to each attacker. The missile took a relatively long time to reach maximum interception range. No further weapons could be launched until some assessment was done. Note that at best an *Adams* could fire at 20 attackers, and probably the number was closer to ten.

The attackers could always use decoys to force the defenders to use up their missiles on non-targets. Ideally the surface shooters should be able to deal with the bombers, and not merely with whatever weapons they launch. Thus the defenders can try to force the bombers to approach to within defensive missile range, and the system designers try to extend the useful range of the defensive weapons.

The backstop role must have been particularly important in the mid-1960s when Australian forces faced those of Indonesia, which had bought Russian missile-armed 'Badger' (Tu-16) bombers.

Note that even when there is a carrier, the battle space cannot always be divided neatly into fighter (outer) and missile (inner) zones. For example, in the Falklands the battle

space was severely compressed because British air search radars (Type 965) could not detect aircraft flying overland, due to their lack of moving target indicators. Fighter and missile zones were mixed, to the point where it became difficult to use missiles for fear of hitting friendly aircraft. HMS COVENTRY was lost partly for this reason (in her case there were also serious operational failings). The better a ship's command and control systems, the better her ability to distinguish targets from friendlies in such confused circumstances – which may be typical of expeditionary warfare.

Once Australia discarded her carriers, destroyers and frigates became the sole air defence of other maritime forces, including merchant ships supporting ground operations. The sole defensive role is very different from the combined one. It is true that the RAAF could, in theory, provide some degree of air power, but experience has shown that such support is virtually useless at any distance – the threat turns up much too quickly for reaction by land-based aircraft. Now limitations on destroyer or frigate magazine capacity and effective range become considerably more serious, because the ships are the only way to eliminate attacking bombers and thus to gain the necessary degree of local air dominance. Anyone doubting the need to dominate the air over an expeditionary operation may want to review events in the Eastern Mediterranean in 1941, when the Royal Navy often had to make do with the point defences provided by its ships. Much the same can be said of numerous Pacific operations slightly later on. The aircraft and the weapons are different, but the point remains that it takes something with real range and flexibility to destroy aircraft and not merely to neutralise their weapons. It is true that no one in World War II had any hope of actually shooting down a bomb or torpedo in the air, but the effect of defensive fire at the time was usually to ruin the enemy's aim, and thus to neutralise his weapons – which is not too different in its consequences from more modern hopes of shooting down a missile before impact (bombs were numerous, and anti-aircraft fire might be seen as an attack on their guidance system).

Since the *Adams* class was conceived in the late 1950s the scale of possible missile attack has considerably increased. During the Cold War that meant regimental-scale raids by Soviet bombers (about twenty to the regiment), some of which could launch more than one missile. Since the Cold War, the advent of inexpensive standoff weapons, such as GPS-guided glide bombs, has made it more and more plausible that mass raids will return. Time scales are likely to be very short, so ships will have to deal with multiple more or less simultaneous attacks. On the other hand, the ranges offered by inexpensive standoff weapons are generally limited, so that a ship with effective long-range weapons may well be able to reach out to the bombers and not merely deal with what they drop.

Unfortunately the threat has changed in another way as well. In the past, the bomber had to acquire its target and lock its missile on. Of the numerous Soviet missiles, only some versions of AS-4 could be launched on the basis of external data. They were locked on (via a data link) after launch by the attacking bomber. A GPS-guided weapon is a very different proposition. If there is some external source of data, such as a reconnaissance bomber or a radar satellite, then at least in theory the missile can be launched into a homing basket by a



The Charles F. Adams class destroyer HMAS HOBART. The Adams class were originally designed to operate with Australia's aircraft carrier as a backstop to 'leakers'. However, when the carrier was decommissioned they became the principle means of air defence at sea. Something they were never really designed for given the limited anti-air missile magazine. (RAN)

bomber which never has to see the target at all. All it must do is feed the appropriate coordinates into the missile. In recent years the United States has demonstrated that a series of radars can update a GPS bomb so that it can hit a moving target such as a drifting ship. GPS hits may not always be possible, but if they are, the bomber may never rise above the horizon of the defending ship. For its part the defending ship can engage the bomber only if it benefits from some external sensor which sees beyond the ship's horizon. In the U.S. Navy, for example, the main such sensor is the radar on board an E-2 Hawkeye. In the case of the RAN, the key sensors may be the big over the horizon radars such as Jindalee. Note, however, that none of these long-range sensors provides targeting data with the precision normally required by a shipboard missile.

At one time anti-aircraft missiles had to be guided all the way to the target. That was the case, for example, with the Standard Missile on board the old destroyers and the current Australian *Adelaide* class frigates (before modernisation). The missile received illumination energy provided by the ship (via a missile director) and reflected by the target. This type of guidance drastically limits the number of targets a ship can engage simultaneously, to one per missile director. The number of directors is limited by the architecture of the ship, generally to four or fewer (two for the frigates, for example). It cannot deal with over-the-horizon targets. In the open sea, the limitation to one target per director may be acceptable because a very fast missile can finish off one target, allowing its director to switch to another in time to deal with it. The closer the ship is to a coast, and the shorter the inherent timeline, the less acceptable such a limit is.

Note that the new active-array directors being installed on board the ANZACs do offer multiple beams and the equivalent of multiple old-style directors. Much the same is true of the active arrays on board the Dutch and German ships operating the SM-2 missile. Note that the SPY-1 of the Aegis system is not such a multi-beam radar, and that it does not multiply the number of simultaneous engagements by equating to multiple co-located directors.

There are two other solutions. One is to make the missile self-homing, as in the U.S. RAM and the French Mistral, both of which use infra-red guidance. The European PAAMS/LAMS system (Aster missile) also uses a seeker on board the missile, in this case a radar, but it uses a command mid-course guidance system similar to that in Aegis (described below). Generally self-homing all the way is limited because it is difficult or impossible to know at launch time where the homing basket will be, for any threat detected at long range. Thus RAM and Mistral are last-ditch systems, not suited to area air defence.

The alternative is to change the way in which the shipboard weapon system controls the missile. That is the approach in the Aegis system that Australia has selected. The special feature of the missiles the system controls is a programmable autopilot which can be updated by the shipboard system. Given the autopilot, the system can send multiple missiles into homing 'baskets' near several airborne targets. The SM-2 missile (which is also on board the modernised *Adelaides*) is still semi-active, like its SM-1 predecessor on the *Adams* and original *Adelaide* classes, but it needs homing illumination only near its target. Thus the missile guidance radars can be time-shared, greatly increasing the number of targets a ship can engage in a short period. In addition, because the missile follows a commanded course, rather than a course always

pointing at the target, through most of its flight, it can fly a much more energy-efficient course. When this type of guidance was introduced, effective missile range roughly doubled.

Actually the system offers a great deal more. The key element is not any of its radars, it is the three-dimensional fire control picture in the central computer or computers. This picture is the basis for commanding the anti-aircraft missiles. Normally, in an Aegis ship, it comes from the ship's SPY-1 phased-array radar. However, other sources can also be used. For example, the U.S. Navy currently employs a Cooperative Engagement Capability (CEC) net of as many as nineteen Aegis ships, which combine their pictures. Any one of them can fire on the basis of the merged (fused) picture. For example, a ship on one side of an island can fire a missile at a target she cannot see, on the other side, if other ships can see that target. CEC also makes it possible to engage stealthy targets. Stealth is generally intermittent; at some aspects the stealthiest airplane or missile is detectable. What protects it is that no single radar can see it well enough to establish a track for engagement. CEC adds up all those partial tracks to form a usable one. In theory a ship can pour on enough radar energy for the terminal engagement, once the missile has been commanded to get close enough.

For that matter, the track picture can be the basis for a missile engagement which is not based on a shipboard radar. The U.S. Navy is doing exactly that with the SM-3 missile, to engage ballistic missiles. SM-3 has an upper stage carrying a kinetic energy kill vehicle which homes on the incoming missile warhead using electro-optics. In this case the ship's SPY-1 radar can provide the track picture, but more likely that would be done cooperatively, using external radars and other sensors, such as infra-red detectors on board satellites.

Yet another application of the track picture idea is to give the missile an independent homing capacity, such as in a new weapon called SM-6. It has an onboard radar comparable to that in the AMRAAM missile. SM-6 is attractive as a way of dealing with low-flying missiles attacking from beyond a ship's horizon. The ship would use information from external sources such as an E-2. They would not have to provide data as precise as that from the ship's own search radar, because the missile's own seeker could make up for some imprecision.

This last capability seems very relevant to Australia. The future Hobart class Air Warfare Destroyer would be able to receive data produced by the big over-the-horizon radars (such as Jindalee). As in the U.S. case, their data would not be anything like as good as that from her own SPY-1 radar. However, in many cases an active radar on board the ship's missiles might make up the difference, if the missile had enough time (thanks to the right trajectory) to use that radar effectively.

The concept of basing air defence on an onboard radar picture and on missiles with autopilots and data links (necessary to update the missiles) is not unique to Aegis. The current European PAAMS/LAMS system is similar in concept, the main difference being that all its missiles use active seekers. A second difference is that the European system seems to have accepted reduced effective range as a way of achieving very rapid reactions and also as a way of



An SM-2 anti-air missile being fired from the USN Arleigh Burke class destroyer USS O'KANE during the recent RIMPAC 2006 exercise off Hawaii. The SM-2 has considerable advantages over the current SM-1 used by the RAN. Apart from being far more accurate and reliable its range is more than doubled, and it can permit the firing ship to handle a considerable number of targets simultaneously through its autopilot enabling time-sharing of the illuminator. (USN)





USS ANZIO leading a combined task group of Danish, Russian, US, UK and Polish naval units in the Baltic Sea. The modern air-warfare ship is not just designed to defend itself and others but to command entire joint and combined operations. (USN)

limiting the size of the defensive missiles. To some extent the Russian S-300 (as in the SA-N-6 system) is comparable.

Because these systems are built around a track picture, they can support a variety of weapons; the requirements are that the weapon fit the launcher and that it have the necessary data link. Thus Aegis also supports the new ESSM version of Sea Sparrow. Because it is designed to use a data link for mid-course guidance, ESSM (unlike the original Sea Sparrow) does not need to detect reflected energy from the target when it takes off. For example, if a ship can receive notice that a target is approaching from beyond the horizon, the missile can be launched before the target is visible. That advantage alone makes for considerably greater effective range and firepower.

Note that the idea of a track picture supporting a weapon via a data link applies to air to air as well as to surface to air weapons. AMRAAM, for example, uses a data link for mid-course guidance, with an active radar terminal seeker. The Russians have both radar (passive [ARM] and semi-active as well as active) and IR guided air to air missiles using mid-course guidance to place them in an appropriate homing basket. From time to time there are proposals to adapt long-range air to air missiles to surface to air use. For example, there is a surface-launched version of AMRAAM. The entire Sea Sparrow series, culminating in ESSM, is in this category. The problem is that the speed of the launching airplane gives an air to air missile a considerable boost. When the same missile is surface-launched, it has only very limited range. The European Aster missile is unusual in that it seems to have been conceived as a lightweight dart, suitable for air to air use, plus a range of boosters (in fact it is not used as an air to air weapon).

The Air Warfare Destroyer must do more than simply protect herself and other ships. The command system needed to maintain the track picture around which the weapon system

is built becomes the natural air control system for an operation. Imagine, for example, an amphibious operation in which helicopters move troops ashore and attack helicopters provide the main mobile support for those troops. Some agency has to coordinate helicopter movements. If the enemy has aircraft of his own, there must be some means of distinguishing friendly from enemy air movements. If some support comes from long-range fixed-wing aircraft, they too must be distinguished from enemy aircraft, and the latter engaged without killing the former. The high-quality air picture needed for air defence becomes the natural means of doing all of this. That is why the U.S. Navy has often used Aegis ships as command ships for complex operations.

For example, in the 1980s an early Aegis cruiser controlled the air operation in which F-14s isolated and forced down a hijacked airliner over the crowded Mediterranean. It took an Aegis-quality air picture to distinguish the single airliner of interest from numerous otherwise indistinguishable aircraft. This is not to say that the system always worked; a similar air control operation off Iran led to the accidental attack which destroyed an Iranian Airbus. In that case the problem was largely that the early version of Aegis involved could not display the situation, including the airliner corridor, completely enough. More modern versions would not have had that problem.

Note that the ship may be called upon not only to defend other ships but also to protect troops ashore and their helicopters against hostile air attack, so that she needs considerable shoreward reach plus some means of detecting targets over land. That means may be a combination of long-range land-based radars (e.g. Jindalee) and anti-air missiles with active seekers, or (more likely) it will involve radar aircraft. There must be some question as to whether aircraft based in Australia can provide the sort of continuous radar

coverage which may be needed at some considerable distance from home. In that case much may depend on helicopter-borne radars or on radars on board unmanned aircraft, some of which may have to be launched from the ship or from ships in company with her.

A second issue is what the ship does beside air defence. In a fleet including a carrier, the carrier aircraft are the most effective means of land attack. Their only real drawback is that they cannot be used effectively in bad weather. If there is no fixed-wing carrier, much or all of the land attack load falls on the major warship offshore, which is likely to be the air warfare destroyer. This question suggests that missile capacity should be sized for more than the likely air defence load. Note that, at least at present, it is virtually impossible to transfer missiles to vertical launcher ships at sea, so a ship must make do with whatever is on board when she goes to sea. For example, it is difficult or impossible to change over from defensive missiles to land attack weapons in a forward area.

It is relatively inexpensive to buy a larger ship with more vertical launchers, which can accommodate either a defensive missile like SM-2 or a land-attack weapon like, say, Tomahawk or perhaps a naval version of the current U.S. Army ATACMS. It is nearly impossible to add many vertical launchers once a ship has been built. This reality is evident in the range of Aegis ships currently in service. The U.S. Navy designed the *Arleigh Burke* class specifically to function both as Tomahawk and as air defence ships, with nearly 100 vertical launcher cells. The current European air defence destroyers, such as the Spanish Aegis ships, the Dutch and German ships

using an Aegis-like system and an active array radar, the French and Italian PAAMS ships, and the British Type 45 LAMS ships, are all about as expensive as an *Arleigh Burke* (often rather more expensive, because the production runs are much shorter). Each has about 40 vertical launcher cells; in some but not all cases they can fire either defensive or land-attack missiles. The Dutch ships may be unique in having reserve space for a few additional vertical launch cells, but even in their case the total is only eight. These ships were all conceived during the Cold War, when the emphasis was on air defence. They may actually function in a world in which expeditionary warfare, entailing land attack, is far more common. It will not be expensive, but actually impossible, to provide them with anything remotely like the land attack capability inherent in the U.S. ship, which is actually less expensive to build. How good a bargain are such ships? It might be added that sheer size buys a degree of survivability, and that smaller is by no means necessarily cheaper when so much of the cost of a ship lies in her combat system.

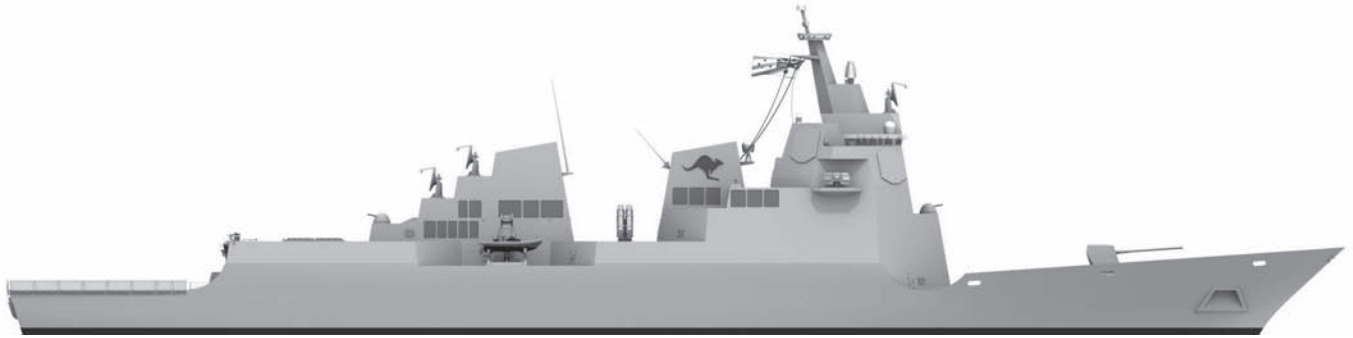
(\*) Dr Norman Friedman is an internationally respected defence analyst specialising in strategic and technical issues. A long-time consultant to U.S. government agencies and a former deputy director of national security studies at the Hudson Institute, he is known for his ability to explain complex technology to the layperson.

Dr. Friedman, who holds a Ph.D. in physics from Columbia University, has written many successful books on navy ships and weapons that combine technical analyses with discussions of the historical, political, and economic influences on design and development. He also writes articles on a variety of defence subjects for journals published worldwide and contributes a monthly column on world naval developments to the U.S. Naval Institute's *Proceedings* magazine.



Three USN Flight IIA Arleigh Burke class destroyers at sea. The Arleigh Burke's each have nearly 100 vertical launch cells for many different weapons such as SM-2 and Tomahawk. This makes them more flexible for operations around the world. (USN)

# The Case For The Fourth Air Warfare Destroyer



## HMAS MELBOURNE (IV)?

**With the Australian shipbuilding industry needing constant work to remain viable, and the RAN's operational tempo increasing into regional trouble spots both locally and overseas, ordering a fourth Hobart class destroyer is starting to make a lot of sense. Added to this are the cost savings involved and the potential for exports.**

**Dr Roger Thornhill takes up the case.**

The Australian Defence White Paper of 2000 carried the statement "...the FFGs are...to be replaced...by a new class of at least three air-defence capable ships". Since then Project SEA 4000 has been established to acquire 'at least three ships', to be known as the Hobart class. Their names will be HOBART, SYDNEY and BRISBANE. The project is budgeted for \$4.5-\$6 billion.

However, in the six years since the White Paper was published the world has changed. Australia now confronts uncertain threats from global terrorism, be it from independent groups or state sponsored proxies. Combating regional instability seems to require a more pro-active military approach and sophisticated warships and anti-ship weapons are proliferating not only in our region but around the world, where the RAN seems to be expending a lot of its operational tempo. Given this setting the RAN is being used operationally more and more in far-flung, ambiguous situations and regions not envisaged by the 2000 White Paper. So "at least three" destroyers may not be enough for what lies ahead. Interestingly, the language used in the 2000 White Paper could be interpreted as leaving the door open for more.

### It's a Numbers Game

Despite the last Hobart class destroyer being commissioned in 2017 (HMAS BRISBANE), and the last two FFGs decommissioned the following year, the RAN will still not break the 'magic number' of 14 warships that Defence strategic guidance has identified as required. Added to this, the first Anzac will be decommissioned seven years later. Currently, there is no Anzac frigate replacement project planned. One of the advantages of ordering another Hobart class destroyer now (which would more than likely be named HMAS MELBOURNE (IV) as this name is currently missing from the RAN's future fleet) is that much of the cost has already been spent in the areas of design development; contract fees; shipyard set up; infrastructure development;

testing and evaluating the design and so on – in fact nearly \$2 billion has already been spent before any steel has been cut.

Adding HMAS MELBOURNE (IV) will represent a very small cost increase but would give more 'breathing space' to the Anzac replacement project and potentially provide uninterrupted work for the local naval shipbuilding industry. Given the seven year gap in major warship construction, assuming the Anzac replacement is not late, the naval shipbuilding industry will have to close down until a new ship class is ordered. When that eventually happens the infrastructure required would have disappeared and the Government will have to pay all the set up costs again that are currently being spent on the Hobart class infrastructure construction. Added to this, the gap will mean a loss of skills to build warships resulting in more cost to re-establish those skills. Acquisition of a fourth destroyer would thus save money, which incidentally will stay in Australia.



The operations room of a modern air warfare destroyer. Operations rooms such as these provide more workstation terminals, big screen theatre wide displays and space for planning and execution of complex joint operations than found on an AEW&C aircraft. The destroyer can also loiter for months and provide its own protection. (USN)

Recently the Senate's Foreign Affairs, Defence and Trade References Committee initiated a study into Naval shipbuilding in Australia (see this edition for the Navy League's submission). The idea being to examine if Australia can continue to build its own warships. The committee is well aware of the national economic benefits or local warship construction, given the Anzac frigate construction example. What they may find is that the greatest threat to Australia's naval shipbuilding capacity is not a lack of skills or resources but a lack of consistency in warship building requirements from Government. Warship acquisition and capability development decisions seem to be made in isolation of the industry. This produces a mismatch as industry will ultimately be relied upon to provide the capabilities being sought. The current SEA 4000 project should thus be reappraised as a means of sustaining the naval shipbuilding capability as well as providing the best destroyers available.

Modern warship construction is becoming increasingly complex given the electronics overheads. In-service-dates for capability introduction are also getting longer than anticipated. If this is the case with the Anzac replacement (as one could reasonably expect) then a fourth Hobart class destroyer will plug the inevitable capability gap from the last destroyer commissioning (HMAS BRISBANE) to the first Anzac replacement. HMAS MELBOURNE (IV) would essentially represent a COTS (Commercial Off The Shelf) or MOTS (Military Off The Shelf) solution given the investment and experience of the previous three and thus represent a very 'low risk' project.

As a spin off, ordering a fourth Hobart class destroyer would have the effect of bringing the price per unit costs down and may make them an attractive export. Taiwan, Canada, Greece, Poland, Singapore, Turkey are all potential buyers for this size and type of warship.

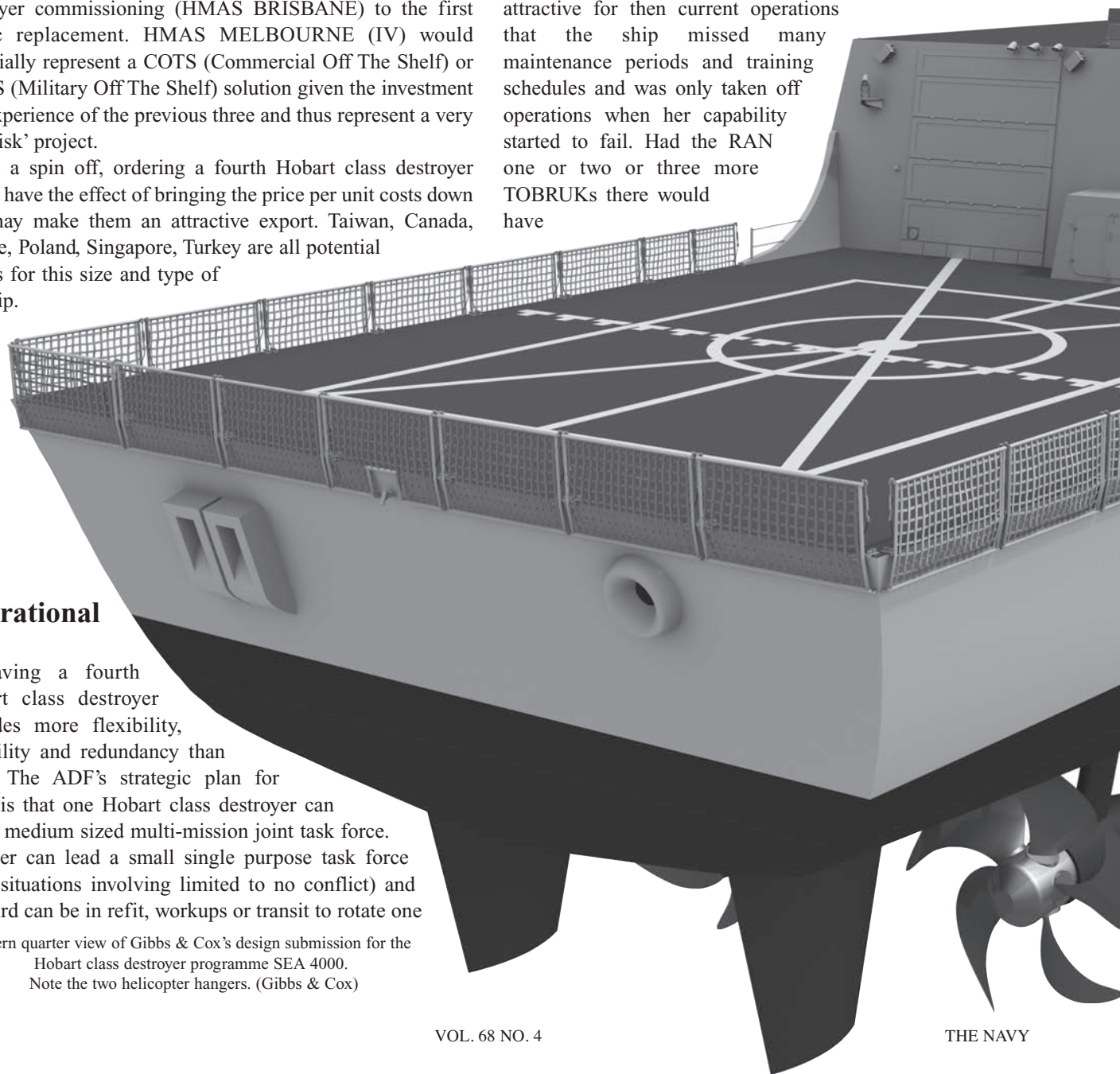
of the others off station and back to Australia. This 'bare bones plan' does not take into account any potential battle damage, accidents, extreme weather, political concerns or any other external issue that could have a bearing on availability or freedom of action. One of those factors may be an intense maritime conflict along the lines of the 1982 Falklands conflict which could require all three at once to be deployed at great distance for six months or more. They may also have to undergo unplanned upgrades to meet emerging and unexpected threats.

Another pressure on future Hobart class destroyer availability involves the ships' capacity for command and control. The Hobart class destroyers' strategic, operational and joint tactical command, control and networking abilities will be unique in the ADF's force structure. Once this capability's effectiveness is fully realised the ADF's senior commanders, and in turn our politicians, will place high demands on their availability. They will become the first choice for almost all domestic security and overseas contingencies, much like the Army's SAS Regiment. Having only three will stretch them and their crews and may eventually result in reduced capability through over use. As an example, some years ago the unique capabilities of HMAS TOBRUK made her so attractive for then current operations that the ship missed many maintenance periods and training schedules and was only taken off operations when her capability started to fail. Had the RAN one or two or three more TOBRUKs there would have

## Operational Use

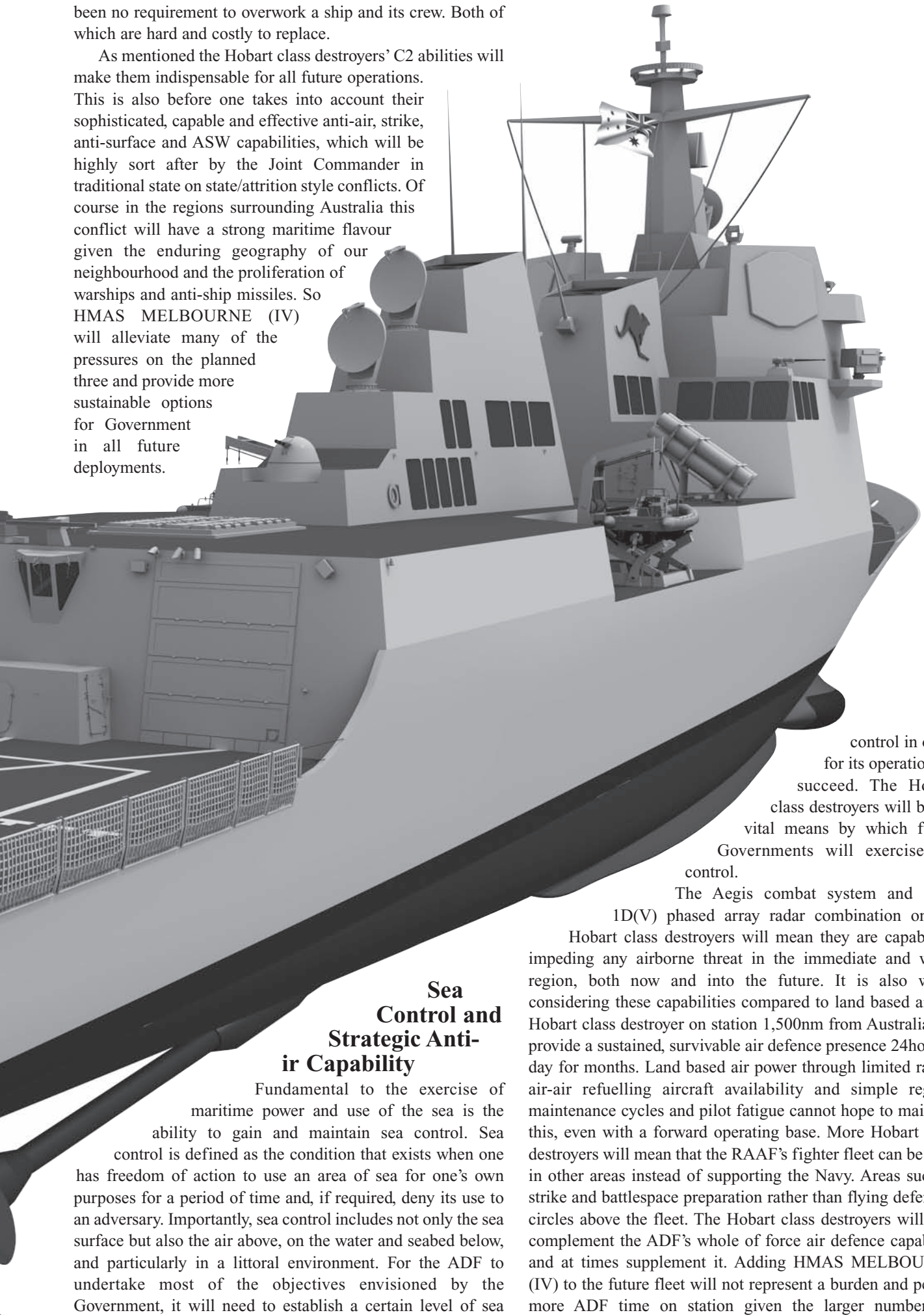
Having a fourth Hobart class destroyer provides more flexibility, capability and redundancy than three. The ADF's strategic plan for Navy is that one Hobart class destroyer can lead a medium sized multi-mission joint task force. Another can lead a small single purpose task force (both situations involving limited to no conflict) and the third can be in refit, workups or transit to rotate one

A stern quarter view of Gibbs & Cox's design submission for the Hobart class destroyer programme SEA 4000. Note the two helicopter hangers. (Gibbs & Cox)



been no requirement to overwork a ship and its crew. Both of which are hard and costly to replace.

As mentioned the Hobart class destroyers' C2 abilities will make them indispensable for all future operations. This is also before one takes into account their sophisticated, capable and effective anti-air, strike, anti-surface and ASW capabilities, which will be highly sort after by the Joint Commander in traditional state on state/attrition style conflicts. Of course in the regions surrounding Australia this conflict will have a strong maritime flavour given the enduring geography of our neighbourhood and the proliferation of warships and anti-ship missiles. So HMAS MELBOURNE (IV) will alleviate many of the pressures on the planned three and provide more sustainable options for Government in all future deployments.



### **Sea Control and Strategic Anti-air Capability**

Fundamental to the exercise of maritime power and use of the sea is the ability to gain and maintain sea control. Sea control is defined as the condition that exists when one has freedom of action to use an area of sea for one's own purposes for a period of time and, if required, deny its use to an adversary. Importantly, sea control includes not only the sea surface but also the air above, on the water and seabed below, and particularly in a littoral environment. For the ADF to undertake most of the objectives envisioned by the Government, it will need to establish a certain level of sea

control in order for its operations to succeed. The Hobart class destroyers will be the vital means by which future Governments will exercise sea control.

The Aegis combat system and SPY-1D(V) phased array radar combination on the Hobart class destroyers will mean they are capable of impeding any airborne threat in the immediate and wider region, both now and into the future. It is also worth considering these capabilities compared to land based air? A Hobart class destroyer on station 1,500nm from Australia can provide a sustained, survivable air defence presence 24hours a day for months. Land based air power through limited range, air-air refuelling aircraft availability and simple regular maintenance cycles and pilot fatigue cannot hope to maintain this, even with a forward operating base. More Hobart class destroyers will mean that the RAAF's fighter fleet can be used in other areas instead of supporting the Navy. Areas such as strike and battlespace preparation rather than flying defensive circles above the fleet. The Hobart class destroyers will thus complement the ADF's whole of force air defence capability and at times supplement it. Adding HMAS MELBOURNE (IV) to the future fleet will not represent a burden and permit more ADF time on station given the larger numbers of

destroyers that can rotate in and out of the theatre of operations.

History has shown that land based fighter aircraft used in maritime settings are less sustainable and responsive to the fleet being protected as it moves further offshore. In fact, the further fighters have to travel the less responsive they become and are more likely to be used in striking targets in an offensive manner rather than acting defensively in the hope of neutralising threats to the fleet before they emerge. One could argue that this tenant of land based air employment is the reason for the rise of the aircraft carrier.

It should be noted that each Hobart class destroyer will have more workstations and space for HQ operations and personal than an AEW&C (Airborne Early Warning & Control) aircraft. Its air surveillance and networking capabilities will also be on par if not superior to the AEW&C in some situations. The other advantage is that the persistent nature of sea power will mean time on station can be measured in months, not hours. The destroyer can also protect

itself, unlike the AEW&C. As a major contributor to the air battle this persistence will allow the exploitation of airpower engagement cycles that modern networking capabilities will bring to the future battlespace. Without the ability to exploit this, all current investment in networking could be considered nothing more than an academic exercise and compromise future airpower effectiveness.

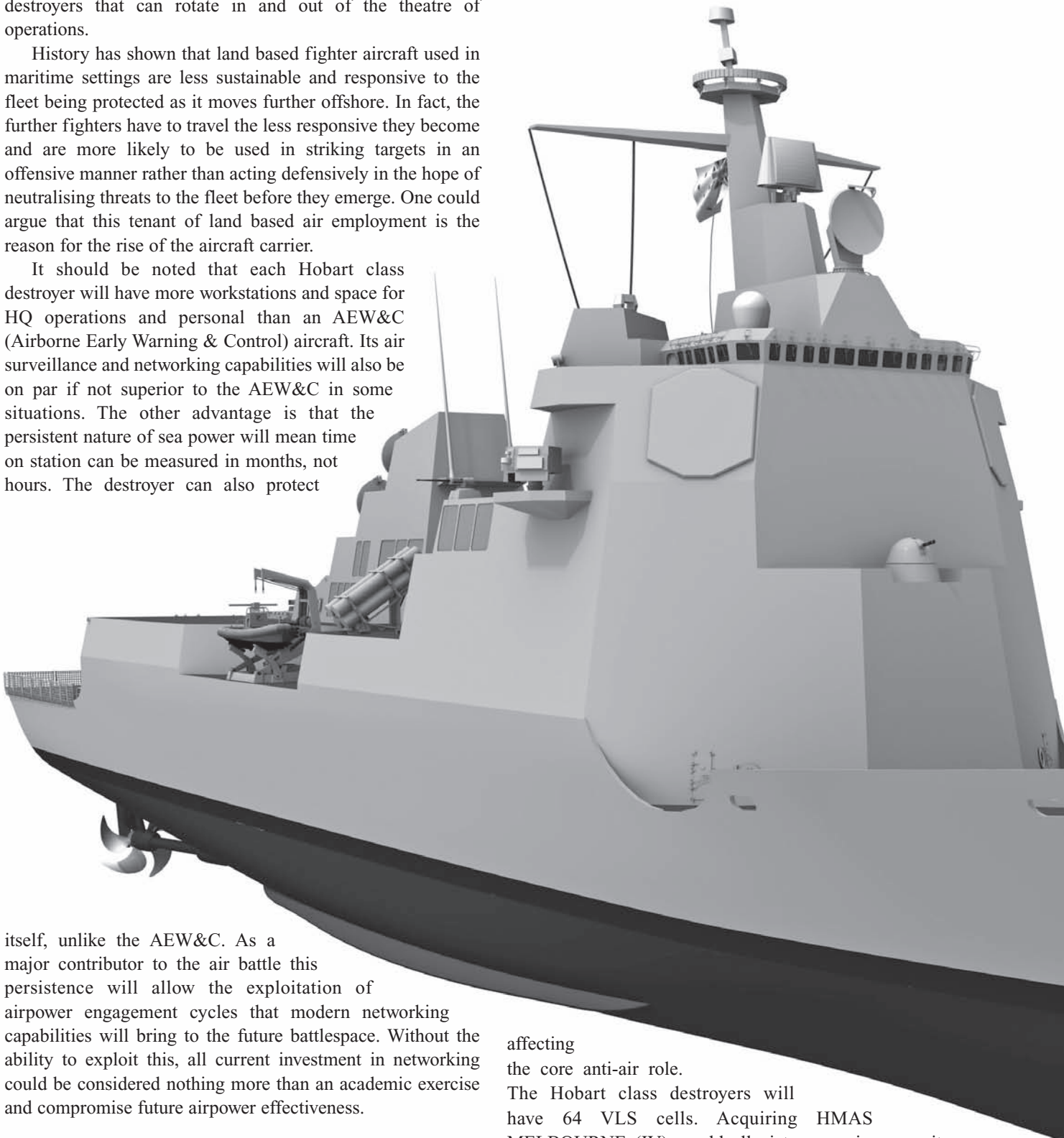
### More Firepower

Given the inability to quickly reload the Hobart class destroyer's Mk-41 VLS (Vertical Launch System) at sea or in the Area of Operations, missile magazine capacity for the new ships will be an issue. Normal anti-air weapon outfits will consist of missiles such as ESSM, SM-2. These will be used for local and area anti-air protection of troops ashore, ships at sea and vulnerable air assets such as helicopters, air-air refuelling tankers and vital AEW&C aircraft. All of which can shelter under the air defence umbrella provided by the new destroyers.

Having more VLS cells available will mean a more diverse range of weapon types can be accommodated without

affecting the core anti-air role. The Hobart class destroyers will have 64 VLS cells. Acquiring HMAS MELBOURNE (IV) would alleviate magazine capacity issues by providing another 64 VLS cells, or a 33% increase in the destroyer capability. It also provides more 'effects' options for the deployed force given the range of different weapons that could be employed.

Missile load out configurations will be important to the in theatre sustainability of the destroyer capability in future operations. The right mix of anti-air, anti-missile, land attack etc will be crucial to its persistence and ability support other fleet units, RAAF actions or troops ashore. There are a number of options in the area of weapons that could provide flexibility and options for the commander or political leaders through the Hobart class destroyers.



The anti-ballistic missile SM-3 can provide theatre wide protection against ballistic missiles targeted at the deployment area or major Australian cities. Acquiring SM-3 for the Hobart class destroyers is becoming more important as China is known to be developing anti-ship versions of two of its intermediate range ballistic missiles. The warheads of these ballistic missiles are to be fitted with either a radar or IR sensor to guide the warhead onto a ship from directly above where ship based air surveillance radars usually do not cover. SM-3 will thus be able to provide protection from this emerging anti-ship threat by engaging the ballistic missile 'down range' (approx 1,500kms – 3,000kms away). The SM-3 can also be used to destroy enemy satellites in low earth orbits being used by enemy forces for spying, communications or navigation given the SPY-1 radar's ability to detect and track them.

The new SM-6 anti-aircraft missile represents one of the greatest weapons to counter air power threats to the future ADF. SM-6 can provide theatre wide air defence when coupled with an AEW&C or any other external air defence radar data-linked to the destroyer (even radars such as the HF Jindalee Over the horizon Radar Network - JORN). SM-6 uses the missile body of the SM-2 but has the fire and forget active seeker head of the air-air AMRAAM (Advanced Medium Range Air-Air Missile). Used correctly the launch ship need never see the target with its own sensors. SM-6 is said to have to capability to shoot down aircraft and cruise missiles at approximately 300 – 400kms. Recent computer based

experiments run by the USN using an AEW&C aircraft, an Aegis destroyer and SM-6 are said to have produced some "amazing results". The Joint ADF of the future, with its AEW&C Wedgetail aircraft, Hobart class destroyers and SM-6, should be capable of achieving no less – assuming the ADF purchases SM-6.

Added to these air defence capabilities is the potential for Tomahawk cruise missile use to accurately attack important strategic land targets at great range. Tomahawk may also be replaced with a more effective weapon during the life of the Hobart class destroyers.

With so many weapon choices a mix of each will decrease the capability in each area, i.e. jack-of-all-trades master of none for a single ship. Adding HMAS MELBOURNE (IV) to the future fleet would better enable the RAN to employ a mixed bag of weapons without losing significant capability in any one area. Flexibility presents options and is thus politically and tactically attractive.

## Conclusion

A fourth Hobart class destroyer, i.e. HMAS MELBOURNE (IV), makes great industrial, economic, operational and strategic sense. In an interview on the TV programme *SUNDAY* some months ago the Minister for Defence, Brendan Nelson, indicated that it is time for the ADF to expand, given the high operational tempo expected of it. This is partly the reason why the Minister announced the raising of two more Battalions of light infantry for the Army.

The calls being made on the fleet in recent years demonstrate the flexibility of the Navy and thus warrant an

increase in its size given that it is starting to show signs of stress, remembering this is without engaging in actual combat operations. This island nation's future strategic security is also becoming more uncertain.

The acquisition of HMAS MELBOURNE (IV) essentially represents a COTS/MOTS proposal given the effort going into the first three. This low risk approach is favoured by governments.

Project SEA 4000 is budgeted for \$4.5-6 billion, which is mostly for setting up the infrastructure needed to build warships. Adding another will not 'break the bank' and will actually save money in the future. Of course the ADF could take the bold step and make modifications and additions to HMAS MELBOURNE (IV), given the lessons of the first three, to give her a greater Flagship, C2 and offensive capability. Although this could see her turning into a cruiser more than an 'enhanced' or 'Batch II' destroyer (which may mean a

A Starboard bow image of Gibbs & Cox's design submission for the Hobart class destroyer programme SEA 4000. This design is evolved from the USN Arleigh Burke class destroyer. (Gibbs & Cox)

name change from HMAS MELBOURNE to HMAS AUSTRALIA).

Maritime power is critical to Australia's national defence, given our enduring maritime geostrategic circumstances. Fundamental to the exercise of maritime power and use of the sea is the ability to gain and maintain sea control. However, from a surface combatant point of view, eight frigates with limited capabilities and only three destroyers will be hard pressed to do this. A fourth destroyer will thus provide further capability for the sustainment of Australian sea control, particularly when in close partnership with the Army and Air Force. The modern surface combatant remains an adaptable, flexible and potent instrument for the Government to apply to ensure continuous use of the sea and whenever and wherever sustainable and credible military effect is desired. The acquisition of HMAS MELBOURNE (IV) should be seriously considered.

### **HMAS MELBOURNE (IV) (Gibbs & Cox evolved design for SEA 4000)**

- Commissioned: 2020(?)
- Length: 148m
- Beam: 18.2m
- Draft: 5.9m
- Displacement: 8,1000 tonnes
- Armament: 2 x 32 Mk-41 VLS (one fwd, on aft) for ESSM and SM-2. Possibly, SM-3, SM-6 and BGM-109 Tomahawk.  
1 x Mk-45 Mod 4 127mm (5-inch) gun. 20rpm to 42kms or 10 ERGMs per minute to 116kms.  
2 x Mk-141 octuple launchers for Harpoon  
Blk II ASM, active seeker with GPS for land attack, range approx 130kms.  
2 x 25mm Bushmaster cannon  
2 x 20mm gatling gun CIWS
- Machinery: CODOG 2 x LM-2500 Gas Turbine engines and 2 x Diesel engines to 2 shafts each to one controllerable pitch propeller
- Max speed: 28kts+
- Range at 18kts: 5,500nms.
- Systems: 1 x SPY-1D(V) phased array radar  
1 x Aegis combat system, baseline 7.1  
1 SPQ-9B ASMD and surface search radar  
1 FLIR optronic tracker  
2 x SLQ-32 V3 ESM and jammer  
2 x 2 Nulka expendable decoy launchers
- Aircraft: hanger for two MRH-90 helicopters or UAVs
- Accommodation for 230 including Task Group Commander and Staff.



The Spanish F-100 air defence frigate ALVARO DE BAZAN. While presenting a far lesser capability than the proposed Gibbs & Cox Evolved AWD design, the F-100 is a cheaper, lower risk MOTS option that is required to be considered under the Department's new capability acquisition guidelines. However, given its lesser capability, it would mean more than four ships would need to be acquired. (Navantia)



Crew members loading an SM-2 missile into its cell position in the forward Mk-41 VLS of an Arleigh Burke class destroyer. Given the awkwardness of the operation (i.e. weight and length of the launch canister) it is generally only done tied up to a dock. (USN)



## **THE NAVY magazine on world stage**

An article that was written for *THE NAVY* and which appeared in Volume 67 Number 3 entitled 'The Genesis of the Airborne Anti-Ship Operation' recently saw its author, David Hobbs, nominated for the Aerospace Journalist of the Year Award (Best Defence Submission).

This is a worldwide award for Aerospace Journalism. The finals night was held in London on 16 July 2006 at the Royal Courts of Justice.

The award is administered by 'The World Leadership Forum' and is sponsored by companies such as Airbus, Rolls Royce, Boeing, Dassault, Embraer, Gulfstream, Honeywell, Northrop Grumman, Singapore Technologies Engineering and Textron.

Being short listed put David Hobbs in the top five Aerospace/Defence Journalists in the world. He actually won the award last year for best defence submission.

Unfortunately David did not win this year. UK Journalist Andrew Brookes won with an article that appeared in *Air International* magazine.

David modestly said at the conclusion of the awards night that "*THE NAVY* magazine was recognised with the top five Aerospace and Defence magazines in the world and can be proud that its name was up on the screen at the presentation." Well done David!

## **MRH-90 to replace Sea King and Black Hawk**

The Government has approved a \$2 billion acquisition of 34 Eurocopter MRH-90 helicopters to replace RAN's Sea King and Army's Black Hawk helicopters.



An ASW version of the Eurocopter MH-90 helicopter. (Eurocopter)

The selection of the MRH-90 complements the decision in 2004 to acquire an 12 MRH-90 helicopters as Army's additional troop lift helicopter. Delivery of the first 12 is scheduled from December 2007 through to December 2009.

The 34 additional MRH-90s will be assembled in Brisbane. When delivered, the MRH-90s will be based at RAAF base Townsville, Holsworthy Barracks in Sydney and HMAS ALBATROSS in Nowra. A contingent will also be based at a joint training facility at Oakey in Queensland.

The new twin-engine troop lift helicopters will provide opportunities for joint fleet management. These benefits include greater operational flexibility and efficiency through common operational, training and logistic systems and a capability to rotate personnel, aircraft, spare parts and role-specific equipment between troop lift, special operations and maritime support commitments.

The MRH-90 is an extremely capable helicopter featuring a modern damage tolerant design, a large cabin volume with ramp and enhanced levels of marinisation.

The Sea Kings will be retired in 2010, followed by the Black Hawks which will be progressively replaced between 2011 and 2015.

As these MRH-90 aircraft will be assembled in Australia this acquisition of at least 34 aircraft will provide significant opportunities for Australian industry and the ADF will gain an operating capability within a relatively short time-frame.

The emphasis of the Australian industry package, worth \$1.2 billion, is on the development and sustainment of critical aircraft mission system

capability. The long term viability of the Australian MRH-90 assembly line will be maximised, ensuring greater development of the skill base required to support the MRH-90 into the future through a strategy aimed at promoting Australian industry as part of the Eurocopter global supply chain.

Also in helicopter news, New Zealand has announced it will acquire eight Eurocopter MRH-90 to replace its Iroquois fleet of helicopters.

## **Names of two new patrol boats announced**

Two additional Armidale class patrol boats (ACPBs), announced as part of the Government's Securing Australia's North West Shelf policy, will be named GLENELG and MARYBOROUGH.

As with the 12 boats of this new class named previously, the two additional ACPBs will be named after Australian cities and towns with close links to Navy heritage.

These ACPBs have been named after the Bathurst class corvettes HMAS GLENELG and HMAS MARYBOROUGH that served the RAN with distinction during World War II.

After careful consideration and taking into account the considerable public interest in the naming process, the Governor General His Excellency Major-General Michael Jeffery AC, CVO, MC has approved the recommendations made by the Chief of Navy for these names.

The patrol boats will enable the Navy to conduct surveillance and monitoring of the North West Shelf in order to protect strategic national assets such as Australia's offshore oil and gas facilities as well as provide an enhanced quick-response capability to respond to potential threats including terrorist attacks. The ACPBs have a 3,000 nautical mile patrol range and world class surveillance and boarding capability.

These additional ACPBs represent benefits to Western Australia's economy, as not only will these boats be built by Defence Maritime Services/Austal at Austal's Henderson shipyard near Fremantle, but the boats will be forward based in Western Australia's coastal port of Dampier.



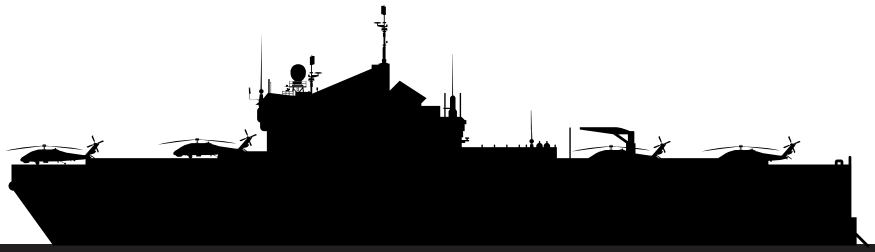
ADI

# Armaris

STRENGTH AT SEA



Photograph Copyright: French Navy / Pascal Fournier.



**MISTRAL CLASS:  
BUILT, TESTED  
AND PROVEN.**



**THE INNOVATIVE,  
LOW RISK CHOICE  
FOR AUSTRALIA'S  
AMPHIBIOUS SHIPS.**

## AWD centre opened

The new Air Warfare Destroyer Systems Centre in Adelaide has been opened. The centre will house Defence and industry participants who will work together on the \$4.5-6 billion Air Warfare Destroyer Programme and bring the successful design to life.

This is a unique arrangement in which the Air Warfare Destroyer Alliance – the Defence Materiel Organisation (DMO), ASC AWD Shipbuilder Pty Ltd (the shipbuilder) and Raytheon Australia Pty Ltd (the combat system systems engineer) – will work with two competing ship designers in the one building.

Both the existing design (based on the Navantia F-100 in service with the Spanish Navy) and evolved design by Gibbs & Cox, Inc. (based on the Arleigh Burke class destroyer in service with the US Navy), will be developed by the AWD Alliance for consideration by Government in the second half of 2007. This competitive arrangement will ensure the Government gets the information it needs to pick the best design to ensure the ADF gets the best possible capability.

The AWD Systems Centre alone will create up to 200 new high-skill jobs in South Australia. These highly skilled positions range from naval architects and engineers to project managers with skills in warship design and systems integration. The Centre also will

generate specialised design work for contractors around Australia.

The shipbuilding itself will create more than 1,000 direct jobs in South Australia as part of the build contract and around 1,000 additional jobs at other shipyards throughout Australia (subcontracted for up to 70% of the module construction work).

Once they are in service, the Air Warfare/Hobart class destroyers will provide Navy with a significant new capability able to:

- Escort the fleet, (including new amphibious ships that will be capable of transporting an entire combined arms battle group, their equipment and supplies).
- Provide both air and surface defence to Australian troops close to shore.
- Track and engage targets at ranges in excess of 150 kms using the Aegis combat system and long range missiles.
- And potentially provide an element of sea-based ballistic missile defence for deployed forces, subject to the growth path chosen.

The Air Warfare Destroyers will be uniquely suited to a range of maritime operations, ranging from high intensity conflict to border protection. In the words of Vice Admiral Russ Shalders, they will provide “a protective bubble for whatever area they are working in”.

Combined with the Joint Strike Fighter, Airborne Early Warning and Control aircraft and Collins class submarines, the AWDs will act as a critical link in a networked Australian Defence Force.

These ships are expected to serve Australia for 30 to 40 years, over which time nations in the Asia Pacific region will have access to some of the most advanced military hardware available.

## SIRIUS delivered five weeks early

Tenix Defence recently delivered the converted commercial tanker *DELOS* to the RAN at the Australian Marine Complex at Henderson WA, five weeks ahead of schedule.

*DELOS* will become the naval oiler HMAS SIRIUS, replacing HMAS WESTRALIA.

The \$60m contract, awarded in February 2005, included seven major modification packages.

The major package required installation design of the Replenishment at Sea (RAS) capability, including RAS Masts, mechanical and electrical equipment and a control centre. This will allow SIRIUS to receive and distribute fuel, water and hard stores to RAN and allied vessels.

The second major package required a helicopter deck to be designed and integrated onto the stern of the vessel – the first of its kind in the world to be done under classification requirements.

In addition, a container deck was added to the existing cargo deck, capable of taking twelve 20ft shipping containers to carry dry provisions and spare parts for fleet exercises.

Tenix was also required to install two upgraded Solas boats, each of 70-man capacity, and two RHIB's from HMAS WESTRALIA, as well as modifying the interior considerably, and fitting the latest communications equipment.

## USN awards contract for more LPD-17s

The US Department of the Navy awarded Northrop Grumman Ship Systems, New Orleans, LA, a contract for construction of two Amphibious Transport Dock Ships, LPD-22 and 23, as well as material and associated labour for LPD-24 on June 1. Prior to this

**Principal Characteristics**

Length Overall.....148 m  
 Beam at Design Waterline.....18.2 m  
 Draft.....5.9 m  
 Full Load Displacement.....8100 t  
 Standard Displacement.....7370 t

High Degree of Interoperability with US Navy

**Performance**

Top Speed.....28+ kt  
 Range.....>5500 nm @ 18 kt

**Crewing/Accommodation**

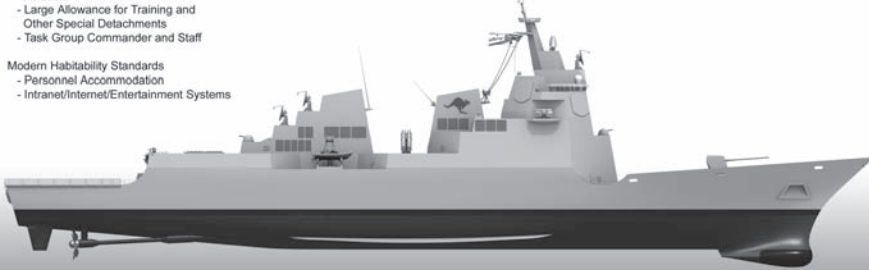
Accommodation for 230 Including:

- Core Crew
- Aviation
- Large Allowance for Training and Other Special Detachments
- Task Group Commander and Staff

Modern Habitability Standards

- Personnel Accommodation
- Intranet/Internet/Entertainment Systems

### AWD Evolved Design Characteristics July 2006 Hobart Class



**Combat System Configuration**

AEGIS Weapon System 7.1  
 SPY-1D(V) Radar  
 64 MK 41 Vertical Launch System Cells  
 3 Missile Directors  
 1 MK 45 5" 62 Calibre Gun  
 2 Harpoon Launchers  
 Electronic Warfare Suite  
 Very Short Range Self Defence

- 2 Close-In Weapons Fore and Aft
- 2 Small Calibre Remotely Operated Stabilised Guns

NULKA  
 Hull Mounted Sonar  
 External Communications Suite

**Machinery & Auxiliaries**

- Gas Turbines and Diesel Engine Propulsion Plant
- Automated Control and Monitoring
- Automated Fire Fighting and Suppression Systems
- Replenishment-at-Sea

**Survivability**

- High Survivability
- Citadel Protection System Zones
- Low Signatures
- Redundancy and Separation of Critical Systems

**Growth**

- Substantial Service Life Growth Margin
- Reduced Through-Life Support Costs

**Mission Support**

- 2 Helicopter Hangars Suitable for Large Future Helicopters and UAVs
- 2 Ship's Boats

The new evolved design by Gibbs & Cox, Inc. based on the USN Arleigh Burke class destroyer.

The evolved design will compete with an 'off-the-shelf' Spanish design to become the Hobart class of destroyers. Much of the design evaluation will be done at the new AWD centre in South Australia. (Gibbs & Cox)

contract, the USN contracted for the construction of five LPD-17 class ships, LPD-17 through LPD-21. LPD-17, USS SAN ANTONIO, was commissioned in January 2006 (see *THE NAVY* Vol 68 No. 2 p18). LPD-18, 20 and 21 are under construction at the NGSS facility in Avondale, LA, while LPD-19 is being built in Pascagoula, MS.

The nine ships currently planned for the LPD-17 class are a key element of the USN's ability to project power ashore. Collectively, these ships functionally replace over 41 ships (LPD-4, LSD-36, LKA-113, and LST-1179 classes of amphibious ships) providing the USN and US Marine Corps with modern, sea-based platforms that are networked, survivable, and built to operate with 21st century platforms, such as the MV-22 Osprey tilt rotor aircraft and the Expeditionary Fighting Vehicle (EFV).

## RN commemorates landings San Carlos Water

The 21st of May 1982 marked the start of the land campaign to retake the Falkland Islands, when elements of 3 Commando Brigade and the Parachute Regiment went ashore in San Carlos.

Exactly 24 years to the day, the RN Type 42 destroyer HMS LIVERPOOL commemorated these events whilst at anchor in San Carlos Water. In 1982 [the narrow waterway was packed with warships, amphibious shipping, merchant ships taken up from trade, and landing craft constantly running back and forth, ferrying troops and supplies from ship to shore.

It was, from shortly after the initial landings, subjected to near constant air attack. This year, however, all was quiet as LIVERPOOL formed the backdrop to the memorial service ashore.

LIVERPOOL's Captain, Commander Henry Duffy Royal Navy, together with a selection of the ship's company participated in a memorial service at San Carlos cemetery to remember those who fell in the landings.

Also present was the Commander British Forces, Commodore Ian Moncrieff Royal Navy, a sizeable contingent from the British forces currently stationed in the South Atlantic, and many Falkland Islanders.

Meanwhile a joint team from the Mount Pleasant Complex (MPC) Sub-Aqua Club and HMS LIVERPOOL dived on the wreck of HMS ANTELOPE, which lies in San Carlos Water, to raise a White Ensign over her, thereby maintaining the tradition of keeping an ensign flying over as many of the Navy's war graves as possible.

A series of work up dives and searches to locate her exact position were necessary. On the day, a team of four divers from LIVERPOOL descended to her fo'c'sle and attached a White Ensign to the barrel of her 4.5 inch gun.

In the centre of the ensign was a Royal Engineers regimental flash and cap badge, to mark the loss of Staff Sergeant Prescott, the Bomb Disposal Officer who was killed whilst attempting to make safe a bomb which lodged inside ANTELOPE.

HMS LIVERPOOL deployed to the South Atlantic in January 2006.

## DIAMANTINA resting at home

The 'Iron Lady' – HMAS DIAMANTINA I – has made her final voyage. To help her along, she sailed with one of her last commanding officers and 11 serving RAN sailors.

Her voyage was only a few hundred meters but attracted the attention of several hundred maritime 'buffs', members of the Queensland Government and members of the public.

Since 1980 the warship has been the prime exhibit at the Queensland Maritime Museum, situated on the southern bank of the Brisbane River. She sat in an historic dry dock, which, during WWII, was vital in the repair and maintenance of US submarines. In recent years, however, the steel caisson holding out the river rusted through allowing water to enter the dock and raise and lower with each tide. Adding to her problems was the development of a crack in a bilge compartment that saw water enter the hull.

Last September the Queensland Government provided \$3.2 million for a contractor to remove the old caisson, take the ship out into the river, replace 70 keel blocks and once the ship was returned, install a coffer dam before building a concrete caisson. Queensland company JF Hull won the contract.

On May 10, it was time to return DIAMANTINA to the dock. Just after 8am a pair of pusher and puller tugs took the strain and inched the warship away from the wharf and turned her about.

Originally, she was bow-in facing the bright red lightship Carpentaria.

This time she was to be bow out so that tourists using the South Bank walkway or passing Rivercats could see her finer lines.

As the old timer, built at Walkers shipyard in Maryborough and launched in April 1944, moved backwards into the dock a nostalgic Peter Grant, the president of the museum association remarked, "well... she's making her final voyage".

Within 24 hours of her return to the dock the steel cotter caisson was in place and the water pumped out.

Now the hull of the ship will be cleaned, inspected and painted.

## Daewoo to build 2nd Korean Aegis destroyer

The South Korean military acquisition agency recently selected Daewoo Shipbuilding & Marine Engineering Co. to build the country's second Aegis-equipped destroyer.

Daewoo is expected to deliver the destroyer to the Navy by the end of 2010.

The contract is part of the Korean Navy's KDX-III programme to develop new warships equipped with the US Aegis combat system. The military will invest more than 3 trillion won (USD\$3.2 billion) to build three Aegis ships by 2012.

Korea commissioned three 3,000-ton class destroyers in the late 1990s under the KDX-I and II programme. The government is now in the process of introducing three 7,000-ton class Aegis-equipped destroyers by 2012 under the KDX-III project.



A computer generated image of the South Korean Navy's KDX-III destroyer. The KDX-III is a larger and more capable USN Flight IIA Arleigh Burke class destroyer. However, the KDX-III could more accurately be called a cruiser.

The fleet will ultimately consist of six 4,200-ton destroyers, three 7,000-ton destroyers with the Aegis combat system and other submarines and combat support vessels. Three units out of the planned six 4,200-ton class destroyers have been deployed for naval operations under the KDX-II project.

## Flying torpedoes

The US Navy has awarded Lockheed Martin a 12-month, USD\$3 million contract for its High Altitude Anti-Submarine Warfare Weapons Concept (HAAWC). The programme will demonstrate delivery of the Mk-54 lightweight torpedo from a P-3C aircraft operating at high altitude, approximately 20,000 feet.

Lockheed Martin's HAAWC concept employs the Lockheed Martin LongShot® Wing Adapter Kit to allow the launch of torpedoes from high altitude and long standoff ranges. This technology enables P-3C aircrews to launch from outside the range of enemy air defences.

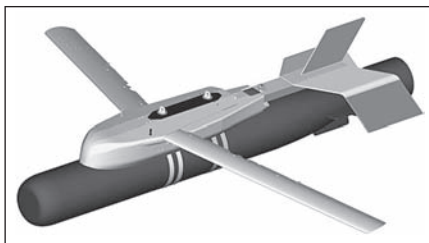
"This is a significant operational enhancement over the P-3C's current method of launching Mk-54s from close to the surface against submarine targets," said Alan Jackson, director of the HAAWC programme at Lockheed Martin Missiles and Fire Control. "Currently, P-3s must descend to a low altitude to deliver the Mk-54. The HAAWC concept improves the delivery accuracy and shortens the engagement time of the Mk-54 torpedo. This new capability will also increase the survivability of both of the aircrew and the aircraft by providing safe standoff."

In addition, HAAWC reduces stress on the P-3 aircraft by allowing it to stay at altitude to launch HAAWC-equipped torpedoes. This will assist in reducing fatigue on those aircraft currently in US Navy service as well as future Navy aircraft.

The demonstration will include a high-altitude launch, where the HAAWC-equipped torpedo will glide to its normal launch altitude close to the surface, and then jettison the LongShot wings prior to water entry. From that point, the torpedo follows its normal operational procedures as it would in a launch from a P-3 from low altitude.

The LongShot is a low-cost, self-contained wing adaptor kit that provides range extension and autonomous

guidance to a family of existing air-to-surface munitions, including sea mines, gravity bombs, laser-guided bombs and tactical munitions dispensers. No aircraft modification is required to deploy a LongShot equipped munition. The system is completely self-contained, including a flight control computer, a GPS-based navigation system and power sources and does not require an electrical interface with the aircraft.



Lockheed Martin's HAAWC concept employs the Lockheed Martin LongShot® Wing Adapter Kit to a Mk-54 ASW torpedo.

## New US aircraft carrier to be named GERALD FORD

The US Senate Armed Services Committee has announced that the United States Senate has approved legislation that would name the US Navy's newest aircraft carrier, CVN-78, as USS GERALD FORD.

As CVN-78 is the first in the new class of aircraft carriers, the legislation would have the effect of placing the former President's name on this entire generation of ships, scheduled to remain in service for the next half-century.

As a young lieutenant, Gerald Ford served aboard the aircraft carrier USS MONTEREY, CVL-26. The MONTEREY earned 10 battle stars during the Pacific Campaigns, including the battles of Makin Island, Kwajalein, Truk, Saipan, the Philippines, and other major engagements.

## SM-3 success

A Standard Missile-3 (SM-3) and the Aegis Ballistic Missile Defense (BMD) 3.6 Weapon System destroyed a ballistic missile target on 22 June outside the earth's atmosphere over the Pacific Ocean. It was the seventh successful intercept for Aegis BMD's SM-3.

The flight mission, Flight Test Maritime-10, was the first to use the new Block IA version of SM-3, which Raytheon is scheduled to deliver to the

US Missile Defense Agency later this year. The SM-3 Block IA provides increased capability to engage both short and medium-range ballistic missiles with rocket motor upgrades and computer program modifications to improve sensor performance, missile guidance and control, as well as lower cost. It also includes producibility and maintainability design changes required to qualify the missile as a tactical fleet asset.

The flight mission was also the second successful test against a medium-range, separating ballistic missile target. The mock warhead separated from the booster section, presenting a more challenging engagement scenario.

In the operationally realistic scenario, the SM-3 was launched from USS SHILOH and hit the target missile that had been launched from the US Navy's Pacific Missile Range Facility on Kauai, Hawaii. The ship's crew was not informed of the target launch time, further simulating a realistic wartime environment. The US Navy's operational testers participated in the planning, execution and assessment of the exercise.

"This test validates the SM-3 Block IA design and paves the way for us to ramp up production of this urgently needed capability," said Edward Miyashiro, Raytheon Missile Systems vice president, Naval Weapon Systems. "The system's and team's continued success is a testament to our focus on Mission Assurance at every level."

A secondary flight mission objective was to evaluate the ability of a land-based X-band radar to cue an Aegis destroyer, via the Ballistic Missile Defense System, to detect and track a ballistic missile. Raytheon Integrated Defense Systems' TPS-X (Transportable Surveillance X-Band) radar, installed on Kauai, tracked the target missile from launch and also tracked the SM-3 Block IA from horizon break through target intercept.



A SM-3 Block IA being launched from the cruiser USS SHILOH. (USN)

## Last Agosta 90B for Pakistan launched

PNS HAMZA, the last of three Agosta 90B submarines ordered from DCN by the Pakistan Navy, was launched on 10 August at an official ceremony in Karachi.

The launch marks the completion of the construction phase of this three-submarine programme.

The contract signed by DCN and the Pakistan Navy in 1994 called for the delivery of three medium-size conventional submarines and a technology transfer package. The first boat, PNS KHALID, was built at DCN's Cherbourg shipyard and has been in operational service since 1999. The second, PNS SAAD, which entered active service in 2003, was assembled in Karachi from hull sections produced in Cherbourg. PNS HAMZA was produced in the same way as PNS SAAD but from hull sections almost entirely fabricated in Karachi and is the only boat so far to feature the Mesma air independent propulsion (AIP) system offering significantly improved submerged endurance. PNS KHALID and SAAD will receive Mesma upgrades in due course.

Agosta 90B submarines carry a complement of 36 and are 76 m in length with the Mesma AIP, or 67 m without the AIP section.



PNS HAMZA, the last of three Agosta 90B submarines ordered from DCN by the Pakistan Navy, being launched on 10 August in Karachi.

## Osprey makes history

Two MV-22B Ospreys, belonging to Marine Tiltrotor Test and Evaluation Squadron 22, made history by completing the first-ever Tiltrotor Aircraft trans-Atlantic flights on July 29. The Ospreys successfully flew from North Carolina to England and back.

"The MV-22's ability to make two trans-Atlantic flights within a three week period, and fly every day in Great Britain



A USMC MV-22 practises in-flight refuelling with a KC-130J tanker. (Bell)

during that time period confirms its reliability," said Col. Glenn M. Walters, VMX-22 commanding officer. "The aircraft and aircrew performed above my expectations in accomplishing the most arduous portion of a self-deployment. This was the final event that demonstrated the full range of unique capabilities this aircraft will provide to our war fighters in the near future."

The flight covered more than 4,000 miles, much of it over the North Atlantic, in challenging weather conditions. Over 40 Marines participated in the exercise, including pilots, aircrew and ground support personnel.

While in England, the Ospreys flew a total of 17 flight events, all of which were executed on time. The Osprey was one of a handful of aircraft at Farnborough to have made all scheduled flight windows. These flights included distinguished visitor and media orientation flights involving short take-offs, tactical approaches to landing zones, hovering and a 'jump' take-off. Additionally, it is estimated that 100,000 people viewed the aircraft on static display.

The exercise began July 8 when three MV-22Bs from VMX-22 and three KC-130J Hercules aircraft from Marine Aerial Refueler Transport Squadron 252, based at Marine Corps Air Station Cherry Point, N.C., left the U.S. for Farnborough. After a stop in Goose Bay, Newfoundland, two MV-22Bs and two KC-130Js continued on to the U.K., while the other aircraft returned to North Carolina.

On July 25, all aircraft left the U.K. to redeploy back to North Carolina. All aircraft and crew safely returned home July 29.

This achievement helped to illustrate improved vertical lift capability for such concepts as Sea Basing and Distributed Operations, and greatly expands the reach and flexibility of Joint forces. VMX-22 and VMGR-252 also validated the Osprey's long-range fuel system capability with the goal of supporting future Osprey deployments.

## RNZN CANTERBURY news

New Zealand Defence Minister Phil Goff announced on 7 August that the former RNZN (Royal New Zealand Navy) frigate, HMNZS CANTERBURY will be sunk as a dive wreck at Deepwater Cove, Cape Brett in the Bay of Islands.

"The disposal of the CANTERBURY for scrap was examined as an option but the greater long term economic benefit to the country was thought to come from the sinking of the frigate as a dive wreck", Mr Goff said.

A number of registrations of interest for disposal of the Canterbury were received from the North Auckland area. The strongest case was that put forward by the Bay of Islands Trust which will be given responsibility for sinking the vessel.

"The Bay of Islands Trust's proposal was seen as having the best potential to deliver the greatest overall economic benefit to the community and the country.

"The addition of a dive wreck will add to the attraction the Bay of Islands has to domestic and international visitors, in what is one of the country's most visited tourist destinations.



The RNZN's new 8,000 tonne Multi Role Vessel NUSHIP CANTERBURY on sea trials.

"The strong support of regional MPs, local government and tourism operators made the Bay of Islands Trust's proposal the strongest we received.

"While this vessel will be sunk, the ships name and its honour board will live on with the newly constructed multi role vessel, due to enter service in early 2007, which will have the same name and same home port", said Mr Goff.

The frigate HMNZS CANTERBURY was commissioned into the RNZN in October 1971 and de-commissioned in March 2005. HMNZS CANTERBURY was the last of the Leander-class frigates in the RNZN. HMNZS CANTERBURY carried a crew of 240 Officers and Ratings.

The new CANTERBURY, an 8,000 tonne Multi Role Vessel which is to be commissioned into Naval service in 2007, commenced two days of sea trials in Holland on 3 July. A total of ten RNZN and Ministry of Defence (MoD) personnel boarded CANTERBURY at the Merwede shipyard, Holland for 48 hours of sea trials.

The ten representatives embarked included Project Director, Commodore (Rtd) Gary Collier, and Navy personnel involved in the setting of machinery and systems prior to the sea trials, and naval members of the MoD project team.

Over the two day trial period, essential sea-going systems such as main propulsion, bow thrusters, Integrated Platform Management System, radars, navigation and mission systems were progressively set to work, integrated with other systems and trialed.

Commodore Collier said the overall impression of the ship is that she is very comfortable. "CANTERBURY is spacious inside with good quality fittings. The design of cabins, messes and working spaces will make living and working comfortable, easy and efficient for her crew. She is sure to be as memorable a ship as her predecessor."

## CAPITAN PRAT (ex-WITTE DE WITH) commissioned

On July 17, the ceremonial transfer of the Dutch air defence frigate HNLMS WITTE DE WITH to Chile took place. A delegation from the Chilean Navy, led by Admiral Rodolfo Codina Diaz attended the ceremony.

HNLMS WITTE DE WITH will now be known as CAPITAN PRAT. She is the third of four frigates being transferred to Chile from the Netherlands. In 2005 the other Dutch air defence frigate (JACOB VAN HEEMSKERCK) and a M class frigate (ABRAHAM VAN DER HULST) were transferred to Chile.

The last frigate will be transferred in April 2007.

HNLMS WITTE DE WITH was formally decommissioned on Thursday, July 13. The Royal Netherlands Navy has now disposed of its last air defence frigate. Their task has been taken over by the new air defence and command frigates of the De Zeven Provincien class.



HNLMS WITTE DE WITH in Dutch service. The ship has since been transferred to Chile and re-named CAPITAN PRAT. She is armed with Sea Sparrow and Standard SM-1 anti-aircraft missiles and will be a powerful addition to the Chilean Navy.

## RAF to get new Nimrods

The RAF is to get 12 new Nimrod MRA-4 aircraft under a £1.1bn contract announced on 18 July 2006 by Defence Secretary, Des Browne.

The Nimrod MRA-4 is a highly advanced aircraft fitted with the latest navigation and reconnaissance systems. It will be used for search and rescue operations and long-range anti-surface and submarine hunting missions. It has a range of over 6,000 miles and patrol endurance of 15 hours.

Operational environments have changed since the existing MR-2 aircraft were designed and the MRA-4 offers more flexibility for the RAF for a variety of different roles. Des Browne said:

"I am very pleased to announce this contract for 12 aircraft, which will help secure over 1,000 high-tech UK jobs. These aircraft are fitted with highly advanced technology and will give our Armed Forces an exceptional patrol aircraft and far greater flexibility.

"The Nimrod MRA4's will be able to operate a wider surveillance role over land and sea as well as continuing to fulfil the vital search and rescue role that the aircraft is already so well known for."

The revised contracting arrangements offer greater transparency, and an essential part in turning the project around was the development of an effective partnering relationship between MOD, BAE Systems and its supply chain. These are key elements of the recently published Defence Industrial Strategy (DIS). Delivery of the first production aircraft to RAF Kinloss is planned for 2009.



An RAF MRA-4 Nimrod test aircraft. The RAF will now receive 12 new multi-role MRA-4 Nimrods.

## New Russian submarine on sea trials

Admiralty Shipyards, a St. Petersburg-based company, said on August 3 that it had started the second round of sea trials of a new diesel-electric submarine.

The SANKT PETERBURG, a Project 677 or Lada-class diesel submarine, was designed by the Rubin design bureau and had conducted initial sea trials in December 2005.

The submarine, whose export version is known as the Amur 1650, features a new anti-sonar coating for the hull, an extended cruising range and advanced anti-ship and anti-submarine weaponry.



A second Lada-class submarine, the KRONSTADT, is being built at the shipyard and another, the PETROZAVODSK, will be laid down in the near future, the company said.

Admiralty Shipyards is a Russian state-owned company that specialises in the design, production and modernisation of civil and naval surface ships and submarines.

Since 1910, the company has constructed 300 submarines (including 41 nuclear submarines) and 68 deep-diving and underwater vehicles. It controls 15% of the global submarine sales market. It has built Kilo-class submarines for India, China and Iran.



The Russian Navy's SANKT PETERBURG, a new Project 677 or Lada-class diesel submarine.

## Kidd class leave for Taiwan

Taiwan recently took delivery of the remaining two Kidd-class destroyers out of four purchased from the United States.

The destroyers, to be named ZUOYING and MAGONG after two Taiwanese harbours, left the United States at the end of August bound for Taiwan where they will join the Taiwanese Navy (ROCN).

The four destroyers were sold to Taiwan at a cost of USD\$800 million after being decommissioned from the USN. Taiwan took delivery of the first two destroyers, KEELUNG and SUA0, commissioning them in December 2005.

According to ROCN Commander-in-Chief Lin Chen-yi, refurbishment of the four warships started in September 2003. An ROCN team was sent to the United States for combat training and to help with reconstruction. The project was completed six months ahead of schedule.

## 4th Sovremenny for China arrives

China has taken delivery of a fourth Sovremenny class destroyer acquired from Russia.

The Sovremenny destroyers are the latest boost to the Chinese Navy's fleet, after China's introduction of eight Russian-made Kilo class diesel-electric submarines.

Under a 1996 agreement, China bought two Sovremenny destroyers and in 2002 signed a USD\$1.4-billion contract for two more. China took delivery of the third Sovremenny destroyer at the end of 2005.

Each is equipped with eight supersonic 3M-80E Moskit SS-N-22 Sunburn (sea skimming) and two SA-N-7 anti-aircraft missile launchers. The Sovremenny class was constructed primarily for surface operations.



China's fourth Sovremenny class destroyer from Russia transiting the Indian Ocean. Note the absence of the aft twin 130mm gun mount and the two Kashtan CIWS either side of the entrance to the helicopter hanger replacing the numerous AK-630 Gatling guns.



The French Navy's (Marine Nationale) MISTRAL with six troop lift Puma helicopters. The MISTRAL recently provided significant assistance to the evacuation efforts out of Beirut during the fighting between Israel and Hezbollah. The ship was able to use her helicopter lift capability as well as docked in Beirut to take people on directly. Makeshift dormitories were set up in her helicopter hanger for evacuees. The Mistral class is one of the two contenders for the new LHD project for the ADF, known as JP2048. (DCN-ADI)

# Observations

By Geoff Evans OBE VRD

## When Part of the Ship is Not Part of the Ship

In a recent issue of the Company of Master Mariners' *MELBOURNE LOG* the writer was surprised to read in a paragraph concerning fires on the balconies of the liner *STAR PRINCESS* that "The balconies are there to afford privacy, but do not form part of the ship's construction. Thus they do not comply with carefully accumulated rules on safety".

It is unreal to think that integral parts of a ship can be excised – become illusory – for particular purposes such as fire safety precautions or whatever. Rather like pretending that for certain purposes the Australian mainland and its off-shore islands don't exist!

## Defence Acquisitions

Recent criticism of the Defence Department's acquisition and purchasing arrangements is surprising given that the system was investigated at length and in detail in 2003 – the Defence Procurement Review – resulting in substantial changes in the Defence Materiel Organisation (DMO). In many respects DMO was 'privatised'.

Prior to the 2003 review another very extensive examination of the management of Australian defence took place in 1996-7 – The Defence Efficiency Review – and as could be expected, this investigation included the acquisition organisation.

Ever since the upheaval caused by the integration of the Navy, Army and Air Departments in a single Department of Defence in the mid nineteen-seventies, Defence seems to be constantly engaged in inquiries of one kind or another. Updating defence arrangements to meet prevailing and perceived future situations is one thing, but chipping away and changing essential parts of the defence organisation must be unsettling to everyone concerned. After thirty or more years the Defence organisation should be fundamentally sound.

Postscript: Since the foregoing notes were completed the Defence Minister has announced yet another review of defence management practices. The review will be overseen by a distinguished businesswoman whose career includes senior executive appointments in the Melbourne City Council and Victorian State Government.

## A Valuable Investigator

Of the many reports that emerge from Federal Government Departments, those of the Australian Transport Safety Bureau (ATSB) concerning maritime accidents must surely be among the most valuable.

The ATSB is an operationally independent part of the Department of Transport and Regional Affairs and is responsible for investigating incidents involving maritime, rail and civil aviation operations within Commonwealth jurisdiction, locally and in the case of Australian ships and aircraft, overseas.

The number of maritime 'incidents' is surprisingly large and may range from injuries to personnel aboard ships, some resulting in death, to collisions between ships large and small, groundings, equipment failures – the list is endless. From the many reports the writer has seen investigations are meticulous and it may take months, sometimes years, to establish the cause. ATSB reports do not apportion blame in findings but as often as not, when human error rather than mechanical failure is involved, the reader will have a fairly clear impression as to where the fault lies. Equipment failures may be checked back

to the manufacturer - the object is to avoid, as far as possible, repetition of a mishap.

Collisions between small craft such as fishing vessels and merchant ships are not uncommon, no less that 37 having been investigated in the last fifteen years – 31 involving fishing vessels, two of which resulted in loss of life, while six involved pleasure craft. Despite numerous warnings by ATSB, failure to keep an adequate lookout was a major cause of collisions, other factors including fatigue (particularly on fishing vessels where the skipper may be the only certified person on board), over-reliance on radar or misinterpretation of the information, and failure to appreciate the time and distance required to manoeuvre a large ship in an emergency.

The care taken in establishing the cause of an incident is illustrated in a report on the loss of the Immigration Department's vessel *MALU SARA* with five people on board in the Torres Strait in October 2005. *MALU SARA* was one of six small six-metre aluminium vessels used to monitor the Torres Strait 'Protected Zone'.

On 14 October *MALU SARA* was returning to its 'home' island Badu after attending a workshop on Saibai Island, a passage normally of some 58 nautical miles, when the skipper reported he was lost in a fog. Communication by satellite phone with the Immigration Department's office on Thursday Island was maintained for a time but when darkness fell *MALU SARA* had not been located. Thursday Island Water Police took over and coordinated a search eventually involving the Queensland Police Service and the Australian Maritime Safety Authority in Canberra. The skipper was instructed to activate the boat's emergency position indicating radio beacon and *MALU SARA*'s probable position was established early on the following morning (15th); however soon after the skipper reported the boat was taking water fast and sinking and contact was then lost. Despite an intensive search over the next six days no trace of *MALU SARA* was found, but the body of one of the female passengers was recovered by Indonesian fishermen 10 days later. The disappearance and search for *MALU SARA* received a good deal of media attention at the time.

ATSB investigators found that a number of factors contributed to the loss of *MALU SARA*: The boat was unseaworthy in a number of respects and was lacking in safety equipment; the risks of operating small craft had not been assessed 'at any level'; the design of *MALU SARA* (and its sisters) had not been properly tested to ensure compliance with appropriate design and construction standards; there were deficiencies in the training of the Department's small-boat crews; low cloud and strong winds hampered the initial search for the missing boat – these are among the findings and recommendations of the detailed ATSB report.

The report led to safety actions being taken by a number of organisations including the Immigration Department (*MALU SARA*'s sisters were withdrawn after the tragedy); the Australian Maritime Safety Authority; Maritime Safety Queensland; the builders of Immigration response vessels and rescue authorities. Not least, Immigration is seeking a meeting of all Commonwealth agencies with a presence in Torres Strait with "a view to the adoption of a whole of government position to clearly define the objectives for the Commonwealth's maritime presence and how best to position resources to meet these objectives".

One hopes some good will come out of the tragedy.

# Naval Shipbuilding in Australia

## The Navy League of Australia's Submission to The Senate Foreign Affairs, Defence and Trade References Committee

In response to a call for papers in February 2006 from the Australian Senate Foreign Affairs, Defence and Trade References Committee on Naval Shipbuilding in Australia, the Navy League of Australia tabled the following submission.



Made in Melbourne, Australia. The then NUSHIP PARRAMATTA being launched at Tenix's Williamstown dockyard facility with the Melbourne skyline as backdrop. Ten world class Anzac frigates were built in Australia in a project that was on time and on budget. One of the great Defence acquisitions success stories of recent times. (Tenix)

This League submission will seek to identify and comment on issues relevant to naval shipbuilding in Australia. Its purpose is to discuss and to highlight the benefit of local production and the issues of continuity and competition.

Insofar as the Inquiry wishes to examine particular matters such as the capacity of the industrial base, the comparative economic productivity of the shipbuilding industry and the comparative economic costs of repair and maintenance the League is content to defer to others. We presume the principal builders, Tenix, ASC, Austal etc will be putting in submissions covering these matters.

### The Benefit of Local Production

While warships can be obtained from overseas there are many advantages in construction in Australia including;

- Employment (in the building of the Anzac frigates, as well as the workforce in the building yard, over 1000 Australian firms received contracts),
- Acquisition of skills and development of industry,
- Through-life maintenance, repair and modernisation/upgrade of ships. While it is possible to carry out these tasks in Australia for ships that have been built overseas, it is much easier if the ships have been built in Australia, since the knowledge and experience is here,
- Current account balance,
- Tax paid to Government by workforce and by industry,

- The existence in Australia of an efficient shipbuilding industry can be of considerable assistance to allied navies – in WW II our shipyards repaired and maintained many allied warships.

The Committee is no doubt aware of the study done on the Anzac frigate programme. The study sets out the benefits to the national economy as well as the gains in technological progress, employment and social outcomes.

It is the view of the League that the above considerations indicate the long term advantages to be had in maintaining a naval shipbuilding industry and if necessary paying a reasonable premium for local construction.

Australia has had a number of yards that have built ships for the Navy. At the present time there are four builders that could be considered able to meet the RAN's needs:

- Tenix Defence – (at the time of writing) presently completing an order for ten Anzac class frigates for the RAN and RNZN at Williamstown in Victoria.
- Australian Submarine Corporation – which has built and is now maintaining six Collins class submarines at Osborne in South Australia. The air warfare destroyer contract has recently been awarded to this builder. With the assistance of the South Australian government the necessary infrastructure is now to be established at Osborne to permit the building of the destroyers.



Made in Sydney, Australia. HMAS SUCCESS being built at Sydney's Cockatoo Island Dockyard. Cockatoo had been producing ships, boats and other craft since 1870. In fact 360 ships, boats and other craft were made at the island. (RAN)



Made in Melbourne, Australia. HMAS NEWCASTLE, seen here, was the second of two Oliver Hazard Perry class (Adelaide class in Australia) frigates built in Australia. They are regarded as being better built than those produced in the US. (RAN)

- Austal in Western Australia and Incat in Tasmania – these builders have built and are building high-speed aluminium multi-hull vessels for the commercial market and for the United States Navy. Austal is at present building 14 Armidale class patrol boats for the RAN.

The League believes that Australian industry has the capability to construct the RAN's destroyers, frigates, patrol boats, submarines, mine warfare vessels and hydrographic ships.

So far as the construction of large naval vessels are concerned the situation appears less clear. Australia has in the past built quite large merchant ships. However, the yards in which those ships were built no longer operate. It may be that local builders believe that they can develop, on a commercially realistic basis, the facilities to construct ships of 25,000 to 28,000 tons. The League is not able to assess the likelihood of this option. No doubt submissions by the builders will deal with this issue.

In the event that a yard cannot be found able to construct ships of such size in Australia then there should be no difficulty in obtaining competitive bids on the world market.

The procedure the League would recommend in such circumstances would be to have the hulls built overseas with the fit out including radars, combat systems, communications, etc carried out in Australia (as is the case with New Zealand's new multi-role vessel).

The Committee is no doubt familiar with the history of MV *DELOS*, a commercially built tanker which was purchased new from an overseas yard by the RAN and is now being fitted out to become HMAS SIRIUS.

Two or three of the builders listed above, plus ADI in Sydney, would be capable of carrying out the fit out of large naval vessels.

The Terms of Reference include the issue of maintaining, repairing and refitting large naval vessels.

Australian industry has the capability to maintain, repair and refit the existing RAN fleet. The League does not see why Australian industry, including ADI with its large dry dock, ought not be able to do likewise for the new large naval vessels. The industry's capacity to do so would be enhanced by having the large naval vessels built or at least completed in Australia.

## Continuity

To ensure the viability of the local shipbuilding industry it is necessary that there be a steady flow of orders. Continuity is essential. It is uneconomic to maintain the shipbuilding

infrastructure if there are long gaps in the building programme. Without work the skilled workforce is soon lost. The Committee may be interested in the discussion of these issues in the United States Naval Institute Journal *Proceedings* of February 2006 and in particular pages 21-23 and 90-91 (the latter pages deal with the UK- situation).

The above observations do not apply in the same way to smaller and simpler warships such as patrol boats. Such vessels can and have been built in yards that have civilian work to sustain them.

In recent years there has been some continuity in naval shipbuilding. Since the late 1980s we have built in Australia two Adelaide class and ten Anzac class frigates and six Collins submarines.

With the three air warfare destroyers (Hobart class) and two amphibious ships now to be built there is the opportunity to ensure a continuous flow of work. It seems that these two programmes will take us through till about 2017. By then the next generation of submarines and frigates will be near to building.

While it can be said that the above programmes involve different types of vessels built in different yards the reality is that much work is shared around or sub-contracted. In the case of the Anzacs Williamstown was the lead yard, but a lot of significant work was done elsewhere in Australia and New Zealand. With the submarines much work was done at places other than Osborne South Australia. It seems likely that a similar process will take place with the air warfare destroyer.

It is the view of the League that it is not inconsistent with a competitive tender to require that a proportion of the work be carried out by other than the 'winning' yard. This should assist in ensuring that the valuable body of knowledge and experience gained in recent years is retained in Australia. Given that a good deal of outsourcing and sub-contracting already takes place such a requirement need not represent an inhibition to competitive tendering.

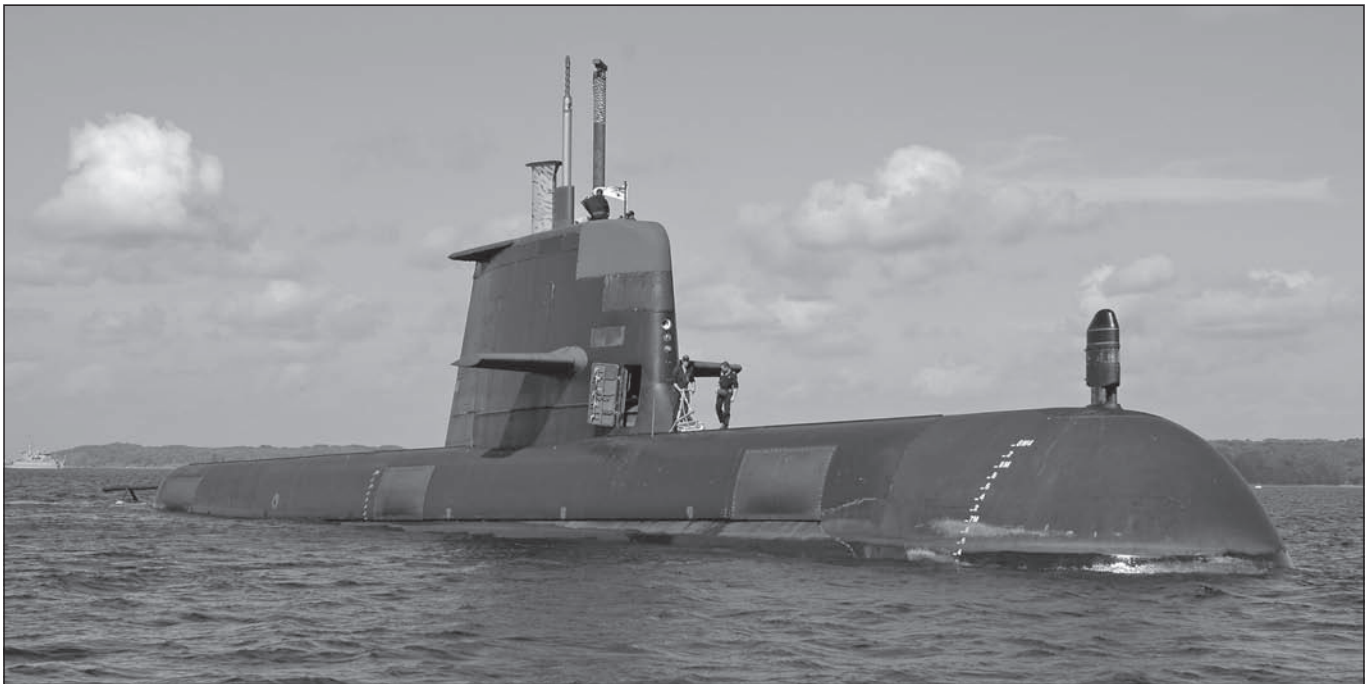
## Competition

The desirability of competition is probably self evident. The real issue is how to obtain real competition when there are few orders and few builders. The problem is made more acute if, as the League believes, it is desirable to have naval shipbuilding in Australia. Obviously it is easier to generate competitive bids if bidding is open to yards world wide.

The issues raised by naval shipbuilding are, of course, not unique to Australia. Even in the United States, with a much larger economy and a far bigger Navy these issues are being actively debated. In the American discussions one issue highlighted was the need to maintain at least some level of competition between builders.



Made in Australia. From front to back, The Fremantle class patrol boat HMAS WOLLONGONG (built in Cairns) and the minehunter HMAS HUON (built in Newcastle) together. (RAN)



Made in, Adelaide, Australia. The Collins class submarine HMAS DECHAINEUX in Jervis Bay NSW. Six very complex Collins class submarines were built in Australia, the first time a submarine class was built here. Through a number of modifications carried out in Australia these six submarines are now considered the 'yard sick' for diesel electric submarines world wide. (John Mortimer)

An article in the May 2005 edition of the United States Naval Institute Journal *Proceedings*, (see pages 54-58) concerning shipbuilding in that country has some relevance for Australia.

The author of the article. Captain David Lewis USN, comments that over the last decade the American industry has consolidated from six independent companies down to two large corporations. He states that their products are increasingly being supplied in a low-risk monopoly or cartel market. "Submarine, aircraft carrier and amphibious ships are monopolies today." In a subsequent comment on Captain Lewis' article Rear Admiral Stuart F Plant USN wrote that Northrop Grumman Newport News and General Dynamics Electric Boat are the only two companies capable of building capital ships and that they co-operate rather than compete for contracts.

Captain Lewis argues that in the United States ship price changes now outpace inflation. "The controlling factor in shipbuilding pricing is the presence or absence of effective competition, not combat capability."

As examples he cites the budgeted cost of a competitively awarded Aegis cruiser in 1985 as US\$884 million and a similarly competitively awarded Aegis destroyer in 2001 at US\$918 million. Despite many combat capability improvements in the latter vessel the increase in price over 16 years was only 4%, well below the rate of inflation. In comparison, the budgeted cost of a competitively awarded nuclear-powered attack submarine in 1987 was US\$638 million in 1987 but a cartel built nuclear powered submarine in 2005 had a budgeted cost of US\$2.5 billion, an increase of 300% in 18 years. There had been significant combat capability improvements incorporated into the later submarine, but just as there had been with the later Aegis destroyer.

Captain Lewis describes five ways that shipbuilding can be said to operate today.

- **Full competition.** Many suppliers, many customers; price and quality, innovation, and cost control maximised. This describes much of the world commercial shipbuilding industry today.

- **Limited competition.** Two or three suppliers for one customer with the latter driving innovation and cost control.
- **Monopoly/Cartel.** One company or one or two companies in combination dominating the industry and able to set prices and control production.
- **Regulated.** Government may establish a regulated monopoly; in return for a guaranteed customer base lower profits and a higher degree of customer involvement are accepted.
- **Publicly Owned.** An Australian example of a publicly owned yard was Williamstown before privatisation.

It is not suggested that the situation in Australia is a monopoly or cartel. Competition for contracts is real. The above definition of limited competition (one customer, two or three suppliers) seems to describe the Australian situation. The Anzac frigate and the Armidale patrol boat programmes suggest that in Australia we can have effective limited competition.

The League can see no reason why the tender for the two large amphibious ships (Joint Project 2048) should not also be competitive. We certainly urge that every effort be made to ensure that this is achieved.



Made in Perth, Australia. HMAS ARMIDALE in Jervis Bay, NSW. The Armidale class patrol boats represent a significant capability jump from the Fremantle class patrol boats they are replacing. (John Mortimer)

# HATCH, MATCH & DISPATCH

## HATCH

### **BROOME and BUNDABERG named**

The Naming Ceremony for the eighth and ninth Armidale class patrol boats to be launched was held at the Austal shipyard in Henderson, Western Australia. Fourteen patrol boats in total are to be delivered to the RAN.

The 56 metre, all-aluminium monohull vessels were named BROOME by Mrs Anne Zilko, daughter of ex crew member Bill Ritchie (subsequently a Commander in the RAN), and BUNDABERG by Dr Jocelyn Pixley, daughter of Lieutenant Commander Neville D Pixley RANR, Commanding Officer, HMAS BUNDABERG.

The ceremony was attended by senior figures from the RAN, Department of Defence, Government and industry including The Hon. Christopher Ellison, as representative for the Minister of Defence, Chief of Defence Force, Air Chief Marshal Angus Houston and Chief of the Royal Australian Navy, Vice Admiral Russ Shalders.

The first HMAS BROOME was commissioned in Brisbane in 1942. She commenced her career engaged on anti-submarine patrols and escort duties in the North Queensland area, following where she transferred to the north coast of New Guinea where she performed similar work in the Port Moresby and Milne Bay areas.

During January 1945 she returned to Australia for refit, followed by further service in New Guinea, after which she proceeded to Darwin where she joined the RAN Survey Group.

The original HMAS BUNDABERG was named after the Queensland Coral Coastal Town. At the completion of her trials in October 1942 HMAS BUNDABERG was assigned to operational duty as a convoy escort vessel on the east coast of Australia between Melbourne, Sydney and Brisbane.

From April to August 1944 she bombarded Japanese positions on Alim Island, took part in landings on Sek Island and gave general support to the campaign which ended with the capture of the Admiralties and the establishment of an Allied base at Manus Island in the Bismarck Archipelago.

Between the latter part of 1944 and mid 1945 BUNDABERG spent her time on patrol and escort duties in New Guinea. In September 1945 she travelled to Borneo and took part in the recovery of Allied prisoners of war and was also present at Kuching for the official surrender of the Japanese forces.



(From Left to Right) The Maritime Commander RADM Thomas, Chairman of Austal Ships John Rothwell, Chief of Defence Air Chief Marshal Angus Houston and Chief of Navy VADM Russ Shalders with NUSHIPs BROOME and BUNDABERG in the background. (AUSTAL)

## MATCH

### **HMAS ALBANY arrives**

HMAS ALBANY, an Armidale class patrol boat (ACPB), is the latest Australian patrol boat to join the Royal Australian Navy's operational Fleet following a traditional commissioning ceremony in the city of Albany on 15 July 2006.

The ceremony was attended by the Hon Wilson Tuckey MP, representing the Minister for Defence, Her Worship the Mayor of Albany Mrs Alison Goode, and the Maritime Commander Rear Admiral Davyd Thomas, AM, CSC, RAN. The ship's Commission was read by the Commanding Officer, Lieutenant Commander Andrew Lugton, RAN.

"The Navy is proud to have HMAS ALBANY join the Australian Fleet and we look forward to many years of service," Lieutenant Commander Andrew Lugton said.



HMAS ALBANY's crew give three cheers for their newly commissioned ship. (Ian Johnson)

Mrs Annette Knight AM, a former mayor of Albany (1988-1997) was the Guest of Honour for ALBANY's commissioning. Mrs Knight, was the naming lady for the ship due to her strong relationship with the Navy developed over a number of years. Mrs Knight is a highly regarded figure in the Albany community and she campaigned with much vigour to have a naval ship named after the town of Albany and to have the decommissioned PERTH established as a dive wreck in King George Sound in Albany in late November 2001.

HMAS ALBANY is the fourth ACPB built in Australia for the Navy by Austal Ships in Perth, Western Australia.

### **PIRIE joins the Fleet**

Armidale class patrol boat, HMAS PIRIE has joined the RAN's operational Fleet following a traditional commissioning ceremony in the city of Port Pirie on 29 July 2006.

Mrs Margaret Humphry of Verdun, SA was the Guest of Honour (Commissioning Lady) for PIRIE's commissioning. Mrs Humphry is the daughter of the late Lieutenant J.W. Ellershaw, RANR who was a member of the commissioning ship's company of the first PIRIE. Lieutenant Ellershaw, the ship's Gunnery Officer, was killed in action when the ship was attacked by Japanese aircraft near Oro Bay, New Guinea in April 1943.

The ceremony was attended by Mr Barry Wakelin MP representing the Minister for Defence, the Chief of Navy Vice Admiral Russ Shalders AO, CSC, RAN and the Deputy Maritime Commander, Commodore Ray Griggs, CSC, RAN.

Commodore Griggs said, "I am delighted to welcome HMAS PIRIE into the Australian fleet. The ship harnesses cutting edge technology, improved habitability and provides the Navy with a very capable ship to undertake surveillance and response tasks."

The ship's Commissioning Order was read by its Commanding Officer, Lieutenant Commander Kimbal Dunsmore, RAN.

"The Armidale class vessels substantially improve the RAN's capability to intercept and apprehend vessels suspected of illegal fishing and quarantine, customs or immigration offences. I am confident PIRIE will serve Australia with distinction for many years to come," said Lieutenant Commander Dunsmore.

The new patrol boat is the fifth state-of-the art Armidale Class Boat built in Australia for the Navy by Austal Ships in Perth, Western Australia as part of a \$553 million contract between the Federal Government and the Defence Maritime Services.

Compared to the current Fremantle patrol boats, the Armidale class boats are over 14 metres longer, with greater range and endurance, and a better sea-keeping capability. They have significantly enhanced habitability, so crews will enjoy greater cabin comfort that in turn will allow them to perform at their optimum ability while at sea.

**PERTH commissions**

The eighth, and final, Anzac class frigate has joined the Navy at a ceremony in Fremantle during August. PERTH's commissioning has drawn the curtain on one of the most successful naval ship building projects in Australia. One of the hallmarks of the Anzac Ship Project has been the delivery of the ships on time and on budget.

Tenix has constructed 10 Anzac class frigates, eight for the RAN and two for the Royal New Zealand Navy.

The RAN took delivery of NUSHIP PERTH on June 16. This followed the successful completion of sea trials in March. More recently, NUSHIP PERTH was undergoing Mariner Skills Evaluation trials off the coast of Victoria for the ship's company to get used to their brand new ship.

**DISPATCH**

**GAWLER and GEELONG depart**

At 5.30 pm Saturday 8 July 2006 HMA Ships GAWLER and GEELONG became the sixth and seventh Fremantle class patrol boats (FCPB) to decommission from the RAN. The ceremony was held at HMAS COONAWARRA, Darwin, Northern Territory.



The Fremantle class patrol boat HMAS GAWLER arrives at Darwin Naval base for the last time. (RAN)

HMA Ships GAWLER and GEELONG were built by North Queensland Engineers and Agents Ltd (NQEA) in Cairns, Queensland and commissioned at Cairns on 2 August 1983 and 2 June 1984 respectively. HMAS GAWLER was the fifth and HMAS GEELONG was the thirteenth of the 15 FCPBs built for the RAN between 1980 and 1984.

Both HMA Ships GAWLER and GEELONG are the second RAN ships to bear their names. The first GAWLER and GEELONG were Australian built Bathurst Class Minesweepers, both seeing active service in World War II.

HMA Ships GAWLER and GEELONG will remain in Darwin after decommissioning, where they will be laid up awaiting disposal.

**Sunsets on FREMANTLE**

After 26-years of faithful service, HMAS FREMANTLE became the eighth Fremantle class patrol boat (FCPB) to be decommissioned.

The ceremony was conducted at HMAS COONAWARRA on August 11, attended by Chief of Navy VADM Russ Shalders AO, CSC, RAN, and Maritime Commander Australia RADM Davyd Thomas.

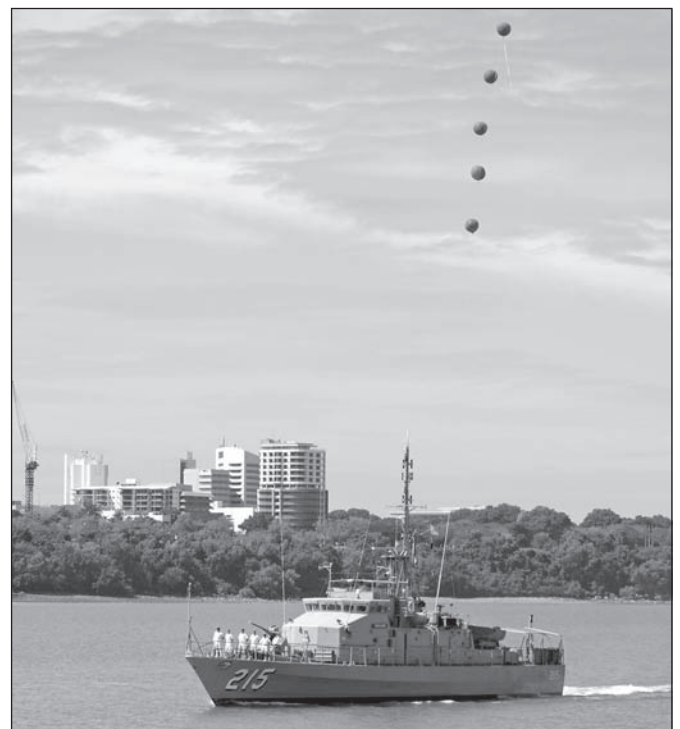
Since being commissioned on March 17, 1980, FREMANTLE has travelled more than 535,705 nautical miles, much of it spent patrolling the 'Top End' in the fight against illegal fishing.

She is one of the RAN's 15 FCPBs currently being replaced by the new Armidale class patrol boats.

FREMANTLE's last CO, LEUT James Harper, said FREMANTLE's loyal service sets the benchmark for the ACPBs coming into service.

The ship will remain in Darwin after decommissioning, where she will be laid up awaiting disposal.

The second RAN ship to bear the name FREMANTLE, HMAS FREMANTLE I was a Bathurst Class Corvette conducting convey escort duties off Australia's east coast during WWII.



The Fremantle class patrol boat HMAS GEELONG flying her decommissioning pennant in Darwin Harbour. (RAN)

# PRODUCT REVIEW

## BATTLEFIELD BRITAIN

DVD

BBC

Distributed in Australia by Roadshow Entertainment

Rec Retail price \$49,95

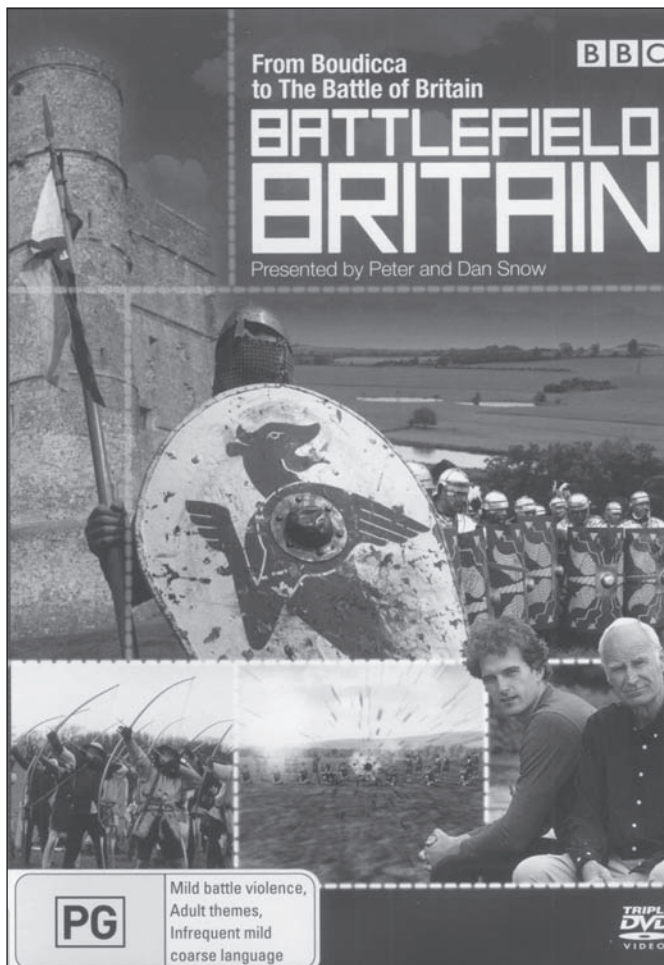
3-Disc set

Region 4, NTSC

Reviewed by Steve Bennet

History comes alive in this epic eight-part documentary series. As Winston Churchill once said, "Battles are the punctuation marks of history" and Britain is a country that has been shaped by centuries of warfare, many of which while pivotal, are quite unknown. These battles also have a bearing on Australia given the English settlement of this great land.

Father and son team, Peter and Dan Snow explore eight turbulent battles, spanning nearly two millennia that have shaped the history of Britain. Using groundbreaking computer graphics and historical dramatisations to bring each battle to life, the Snows explore the lives of the men who fought those battles, the weapons and tactics they used, and the effect their efforts had on the history of Britain. Experience for the first time what it must have been like to ride, march, fly or sail into some of the most important battles the world has ever known. The team also visit the site of those battles fought many years ago and take the viewer on a ground level tour to gain a better appreciation as to how the battles ended the way they did.



Battles featured in this series include: Boudicca's Revolt, Hastings, Battle for Wales, Spanish Armada, Naseby, The Boyne, Culloden and the Battle of Britain. Dan Snow describes his project, "in the old days with medieval history, no one went there because there were so few visual sources and everyone did the Second World War. Now, with the advances in technology available to us we can all take a closer look at the reality of ancient war." How very true. The graphics used are sensational and really bring history to life providing the modern TV generation with the necessary visualisations to cater to their tastes. Some of the weapons used in those days are also recreated and tested to give the viewer a better idea of their effectiveness and lethality.

The only potential downside to this DVD set is that it is coded for NTSC and not the PAL system usually found in Britain and Australia. While made for Region 4, which covers Australia, NTSC is a format used for US audiences. Some Australian viewers with older DVD players or TV's may have problems decoding the DVD to watch. Best check if your DVD player can handle NTSC format.

All in all *Battlefield Britain* is a wonderfully made and well developed documentary series for anyone interested in military history or how modern Britain was founded. Highly recommended.

## THE NAVAL INSTITUTE GUIDE TO WORLD NAVAL WEAPON SYSTEMS

Fifth edition

By Dr. Norman Friedman

912 pages, 864 images, 49 drawings.

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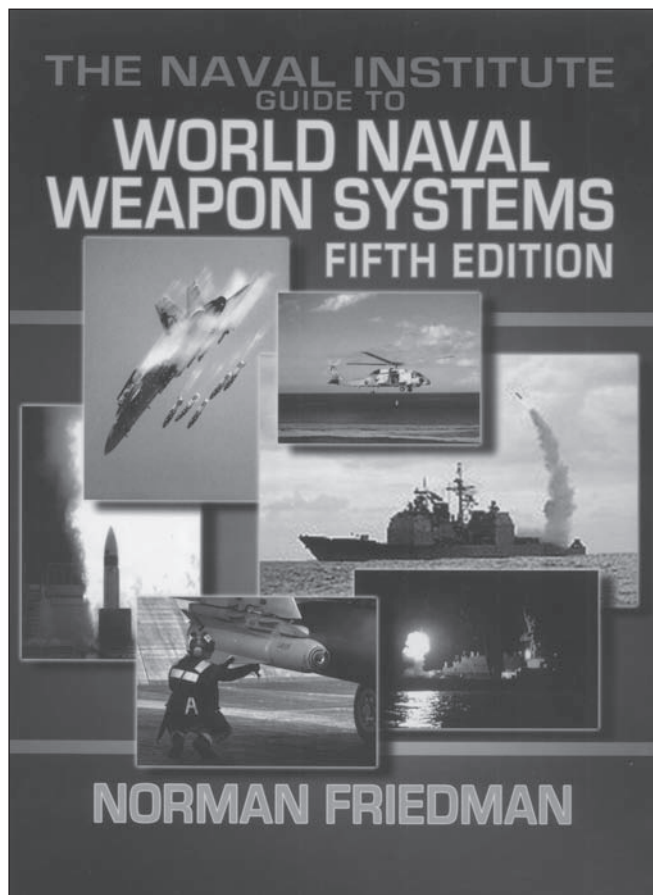
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This book would have to be by far and away one of the most informative, well researched and comprehensive account of the world's naval weapon systems. One of the world's leading most recognised naval analysts, Dr Norman Friedman describes the naval weapons and systems in detail as well as examining the crucial relationship between them. This new edition of his guide, completely rewritten and newly illustrated, makes a special effort to provide a clear and precise account of how weapons technology has changed to meet the new tactical and strategic challenges facing international naval forces today. Cutting-edge information is found throughout the book and enhanced by many new and rarely seen photographs and drawings. For example, Dr Friedman offers an unusually full account of the 'system of systems' under development by the U.S. Navy and the other services to fight future limited regional wars. That initiative includes the changing role of space resources as they affect war on, over,





and under the sea. The work also benefits from the flood of material from Russia, whose weapons and systems are now owned and operated by numerous countries and are likely to be sold to many more.

The guide provides uniquely detailed coverage of weapons developed and deployed in Australia's immediate region, an area that promises to be the liveliest scene of naval action in the future. Extensive sections are devoted to explaining the intricate workings of sensors and command systems. No other book, or even set of books, offers this sort of material in such an accessible form. For the most comprehensive and up-to-date information about weapons in every navy in the world, this is the essential resource, its detail and completeness backed by the authority of a long established professional expert. It is a work that, in effect, can serve as a textbook of modern naval technology.

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A. D. Baker III, editor of *The Naval Institute Guide to Combat Fleets of the World* from 1967 to 2002.

## FROM COUNTENANCE TO CATALYST, 1941-2006 – AUSTRALIA'S NAVY IN THE GULF

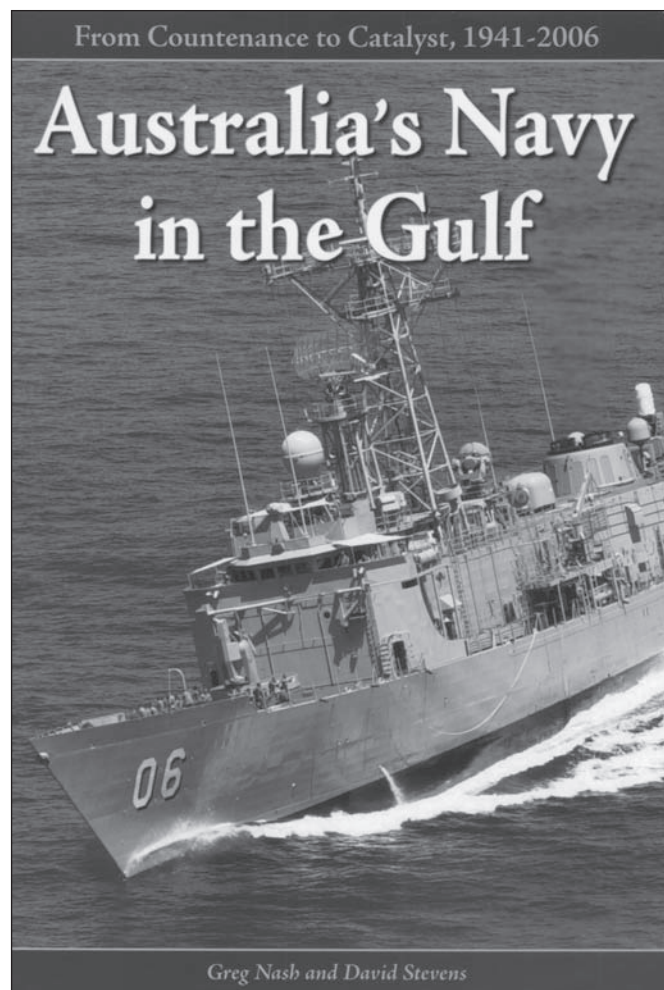
Topmill Pty Ltd and the RAN Seapower Centre  
2006

By Greg Nash and David Stevens

Rec retail price \$19.95 softcover, \$49.95 hardcover

The RAN has had a long and distinguished history of operations in the Middle East. In this book, the authors cover all the Navy's Persian Gulf operations; from actions against the Axis powers during WWII, through to the Wars of 1991 and 2003, United Nations sanction enforcement during the 1990s, and recent contributions to the international efforts to stabilise and rebuild Iraq. Operating in confined and often treacherous waters, Australian ships and sailors have played a vital role in boarding, escort, mine clearance and task force protection duties. *Australia's Navy in the Gulf* is the first comprehensive look at what has become one of the longest ongoing operational tasks ever undertaken by the Australian Navy.

Illustrated with many images and maps this 96 page book is available in soft and hard cover.



# STATEMENT of POLICY

Navy League of Australia

The strategic background to Australia's security has changed in recent decades and in some respects become more uncertain. The League believes it is essential that Australia develops the capability to defend itself, paying particular attention to maritime defence. Australia is, of geographical necessity, a maritime nation whose prosperity strength and safety depend to a great extent on the security of the surrounding ocean and island areas, and on seaborne trade.

The Navy League:

- Believes Australia can be defended against attack by other than a super or major maritime power and that the prime requirement of our defence is an evident ability to control the sea and air space around us and to contribute to defending essential lines of sea and air communication to our allies.
- Supports the ANZUS Treaty and the future reintegration of New Zealand as a full partner.
- Urges a close relationship with the nearer ASEAN countries, PNG and the Island States of the South Pacific.
- Advocates the acquisition of the most modern armaments, surveillance systems and sensors to ensure that the ADF maintains some technological advantages over forces in our general area.
- Supports the acquisition of unmanned aircraft such as the GLOBAL HAWK and UCAVs.
- Believes there must be a significant deterrent element in the ADF capable of powerful retaliation at considerable distances from Australia.
- Believes the ADF must have the capability to protect essential shipping at considerable distances from Australia, as well as in coastal waters.
- Supports the concept of a strong modern Air Force and highly mobile Army, capable of island and jungle warfare as well as the defence of Northern Australia and with the requisite skills and equipment to play its part in combating terrorism.
- Advocates that a proportion of the projected new fighters for the ADF be of the STOVL version to enable operation from suitable ships and minor airfields to support overseas deployments.
- Supports the development of amphibious forces to ensure the security of our offshore territories and to enable assistance to be provided by sea as well as by air to friendly island states in our area and to allies.
- Endorses the control of Coastal Surveillance by the defence force and the development of the capability for patrol and surveillance of the ocean areas all around the Australian coast and island territories, including the Southern Ocean.
- Advocates measures to foster a build-up of Australian-owned shipping to ensure the carriage of essential cargoes in war.

As to the RAN, the League:

- Supports the concept of a Navy capable of effective action off both East and West coasts simultaneously and advocates a gradual build up of the Fleet and its afloat support ships to ensure that, in conjunction

with the RAAF, this can be achieved against any force which could be deployed in our general area.

- Is concerned that the offensive and defensive capability of the RAN has decreased markedly in recent decades and that with the paying-off of the DDGs, the Fleet lacks area air defence and has a reduced capability for support of ground forces.
- Advocates the very early acquisition of the projected Air Warfare Destroyers.
- Advocates the acquisition of long-range precision weapons and the capability of applying long-range precision fire to increase the present limited power projection, support and deterrent capability of the RAN.
- Advocates the acquisition at an early date of integrated air power in the fleet to ensure that ADF deployments can be fully defended and supported from the sea.
- Advocates that all Australian warships should be equipped with some form of defence against missiles.
- Advocates the future build up of submarine strength to at least 8 vessels.
- Advocates that in any future submarine construction program all forms of propulsion be examined with a view to selecting the most advantageous operationally.
- Supports the maintenance and continuing development of a balanced fleet including a mine-countermeasures force, a hydrographic/oceanographic element, a patrol boat force capable of operating in severe sea states, and adequate afloat support vessels.
- Supports the development of defence industry supported by strong research and design organisations capable of constructing and supporting all needed types of warships and support vessels.
- Advocates the retention in a Reserve Fleet of Naval vessels of potential value in defence emergency.
- Supports the maintenance of a strong Naval Reserve to help crew vessels and aircraft in reserve, or taken up for service, and for specialised tasks in time of defence emergency.
- Supports the maintenance of a strong Australian Navy Cadets organisation.

The League:

- Calls for a bipartisan political approach to national defence with a commitment to a steady long-term build-up in our national defence capability including the required industrial infrastructure.
- While recognising budgetary constraints, believes that, given leadership by successive governments, Australia can defend itself in the longer term within acceptable financial, economic and manpower parameters.

The last catapult shot from a Carrier at sea for the Tomcat. Here an F-14D Tomcat from VF31 'The Tomcatters', aircraft 112, launches from the USS THEODORE ROOSEVELT for the last time. (USN).



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