Modern Anti-Ship Missile Defence
Pt 1 Guns

The 1942 Channel Dash

The Underwater War in the West

Electric Warship Heralds Weapon Evolution

Australia’s Leading Naval Magazine Since 1938
The Norwegian USS class submarine UTSTEIN (KNM 302) on the surface during the NATO exercise Otter One. The Norwegian submarine and other naval vessels joined US active and reserve anti-submarine forces, including the large stealth nuclear-powered submarine USS SEAWOLF (SSN-21) for the exercise. The mission of the Warlike exercise was to hunt Allied and NATO submarines. (USNI)
“STAR WARS”

In an article headed “TBMD and the RAN” published in the July-September 2000 issue of THE NAVY, Mark Schwikkert reported on theatre ballistic missiles which had proliferated and with their great range posed a potential danger for particularly every country in the world. The author described measures being taken by various countries to counter the threat including a possible role for the Royal Australian Navy’s planned air warfare destroyers, a role that could well provide the RAN with an opportunity to destroy an incoming ballistic missile.

It is unnecessary to repeat here the technical aspects of anti-missile defence described in THE NAVY article nor to comment on media speculation on the subject – often referred to as “STAR WARS”. Two questions, however, come to the mind and seem not to have received adequate attention.

If an incoming object is located and thought to be a hostile ballistic missile, who gives the order to discharge an anti-missile device? Given the need for a quick decision, is the operator of the detection equipment who happens to be on duty expected to assume responsibility for possibly starting a major war?

Assuming the object is in fact a hostile missile and it is decided to destroy it, what happens to the contents of the warhead if they happen to consist of nuclear or chemical materials? Are they incinerated, or do they float around forever?

Geoffrey Evans

THE MELBOURNE/VOYAGER COLLISION

The collision between the aircraft carrier MELBOURNE and the destroyer VOYAGER in February 1964 was a tragic event for the men who lost their lives, their families and for many in the Royal Australian Navy who lost friends and shipmates. Apart from the loss of a valuable ship, the reputation of the Navy also suffered in the aftermath of the collision and the two Royal Commissions into the disaster.

Unfortunately for the families of those who lost their lives they have had little chance to put the tragic period behind them, media reports of court proceedings involving claims from former MELBOURNE personnel or published reports of conjecture as to the cause of the collision by people uninvolved in the event, are frequent reminders.

It is fair to say due to the death of the principal officers involved, either in the collision between MELBOURNE and VOYAGER or through the passage of time will never be known. This was accepted by the 2nd Royal Commissioners.

Reminders in the form of court proceedings are probably inevitable in the coming months but conjecture in the future should surely be best left to the naval staff colleges.

Geoffrey Evans

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The threat posed by the dedicated anti-ship weapon is not a new one. During WW II, the Germans used several types of anti-ship glide bomb/missiles with varying degrees of success. They realised that in order to keep the attacking aircraft safe from a ship's numerous anti-ship guns, and score a hit, that standoff and precision were required. This idea spawned a number of air-launched weapons, which in appearance, are not too dissimilar from the anti-ship missiles of today. The Germans' were initially able to produce the required precision by the aircraft's bombardier guiding the weapon from his position in the bomber's nose using radio signals or wires, which transmitted instructions to the weapon's control surfaces, which also enabled it to glide to the target. One version even employed a TV camera in its nose feeding images back to the bombardier who had a TV monitor in the aircraft for even greater accuracy. Most employed a small rocket motor for even greater standoff.

One of the first anti-ship successes of the radio controlled glide bomb, a Horten 293, occurred on 27 August 1943. A patrolling Luftwaffe Dornier 217 which had recently been fitted to use the new 1,000lb precision anti-ship glide bomb found the British sloop HMS EGRET in the Bay of Biscay. It dropped its glide bomb, which from a safe distance, scored a direct hit and sank the sloop. Later versions of the 293 were fitted with rocket motors to provide even more standoff (The Australian War Memorial has one of these in its 'Annex' collection).

Despite the loss of the sloop EGRET the most quoted ASM (Anti-Ship Missile) success remains the Israeli destroyer Eliat's 1967 sinking at the hands of three Russian made, Egyptian fired, SS-N-2 Styx missiles. This was the first ASM attack where the weapon guided itself to the target. Quite rightly, this incident was seen as a turning point in naval warfare.

Three years after Eliat's sinking the USN, seeing the pragmatism of the incident, issued a contract to General Dynamics to study the feasibility of a close-range gun system based on the 20mm Vulcan cannon. In 1973 the first prototype Close In Weapon System for the USN, the Phalanx, went to sea aboard the destroyer USS KING but it wasn't until 1981 that the first production mount went to sea, Anti-Ship Missile Defence (ASMD) was now starting to take shape.

The Australian War Memorial's World War II HS-293. The HS-293 was a German rocket powered radio controlled glide bomb which provided standoff and precision to protect the launch aircraft from numerous, and sophisticated ship borne anti-ship defences (Mark Schwikkert).
Since the ASM attacks on HMS SHEFFIELD and USS STARK ASMD tactics and technology have developed at a faster pace than has been incorporated into hard and soft kill. Hard kill denotes the actual destruction of the incoming threat through either guns and/or missiles. Soft kill is designed to manipulate the missile’s seeker into malfunctioning enough to produce inaccuracies in the guidance. For example, during WW II the allies realised that the German radar controlled anti-ship bomb/missiles used one of 18 channels in the 40-50MHz band. A powerful transmission along that frequency range would jam the steering signal from the aircraft - sending the missilebomb into the sea. This measure rendered the weapon useless - until a countermeasure could be found.

**GUNS**

While the use of medium calibre guns for ASMD is a cost-effective solution the problem with using a gun system to destroy in incoming ASM is that it must be able to destroy or inflict serious damage on a relatively small, potentially moving target. The main drawback of the gun is the ASM role is that once the projectile has left the barrel it cannot be influenced by the firer. Its accuracy is governed by factors such as the precision of the tracking sensors, the dispersal pattern of the gun, the time of flight, firing platform motion and wind speed in-between the gun and the target. The target could also be manoeuvring violently, such as the ‘corkscrew’ manoeuvre of the new Russian SS-N-27 ‘Siziler’, in order to take advantage of the gun’s limitations. Another drawback is the limited range of the gun which restricts its use to the close in defence layer.

One of the counters to these problems is to throw a constantly moving radar controlled ‘wall of lead’ at the target through gun systems that have very high rates of fire with their own detection, tracking and ballistics computer systems. These systems are known by the abbreviation CIWS (Close In Weapon System). In the ‘close-in’ role the CIWS is a very cost-effective defence particularly if other systems fail to negate the incoming ASM or are missing in a Navy’s capability inventory. The CIWS can also keep firing and be effective when other hand kill ASMD systems cannot engage the threat due to proximity and ‘safe arm distance’ limitations. The CIWS can also engage many ASM targets due to the amount of ammunition it can employ, both on the mount and in storage on ship. For example, the magazine of gun ammunition for a medium calibre CIWS could potentially engage up to four ASM with four magazines taking the same space as a single missile in the ship’s storage compartment. It should also be noted modern CIWS can engage low flying aircraft attempting to drop ‘dumb bombs’ on the ship and that some CIWS are being modified to enable engagement of surface targets. The following is a short description of some of the leading CIWS available today.

**The Mk-15 Phalanx**

By far the most common and numerous CIWS is the Mk 15 Phalanx. Phalanx is a ‘closed-loop’ (i.e. tracking both the target and the stream of rounds) weapon system designed to provide the last layer of hard kill defence against ASMs. The system consists of a stand-alone mount employing a 20mm M61A1 Vulcan Gatling gun with a cylindrical magazine and feeding mechanism suspended beneath it and a detection and tracking radar unit above.

The radar is a pulse doppler sensor with a vertical tracking antenna at the front and a search antenna at the top. The system is capable of automatically searching, detecting, evaluating, acquiring, tracking and firing on an incoming ASM.

Target can be detected at 3nm (5.6km) and acquired at 2nm (3.4nm). Firing usually begins at 1nm (1.85km) with a maximum probable kill at 400nm. System reaction time is reported to be approximately three seconds.

Although designed for autonomous missile engagement, later versions of Phalanx can be designated by other ship sensors through the combat and weapon control system in the operations room. Four versions of Phalanx have been made with others planned:

- **Block 0**
  - This version features a 16-bit computer and a 980-round magazine. The hydraulically driven gun drive provides a rate of fire of 3,400rpm. A powerful transmission along that frequency band. A powerful transmission along that frequency pattern of the gun. The time of flight, firing platform motion and wind speed in-between the gun and the target.

- **Block 1**
  - This is an upgraded Block 1A and adds a surface engagement mode capability to the anti-missile role through the attachment of an on-mount optical director. A High Definition Thermal Imagery and video tracker is mounted on the left of the radome and provides the engagement controller with a manual acquisition capability from the operations room. Improvements to the software ensure the mounting will automatically break off a surface engagement if an air threat appears within range. Tracking accuracy has also been improved.

- To reduce round dispersion the gun barrels have been lengthened by 482mm and extend its muzzle added while the elevating mass has been modified.

**Millennium GDM-008**

The GDM 008 is a Oerlikon-Conraves 35mm revolver cannon previously known as the Millennium MGD-35. It is intended as a CIWS using AHEAD (Advanced Hit Efficiency And Destruction) ammunition.

**Baseline 0**
- The gun assembly in this model has a pneumatic gun drive which increases the rate of fire to 4,500rpm/min. It has a 1,470-round magazine with tungsten penetrators. The radar’s sensitivity has also been improved.

**Block 1**
- This mounting, which entered service in 1996, has a 32-bit microprocessor and Ada-language software to improve accuracy as well as having longer barrels for improved range and accuracy.

**Block 1B**
- This is an upgraded Block 1A and adds a surface engagement mode capability to the anti-missile role through the attachment of an on-mount optical director. A High Definition Thermal Imagery and video tracker is mounted on the left of the radome and provides the engagement controller with a manual acquisition capability from the operations room. Improvements to the software ensure the mounting will automatically break off a surface engagement if an air threat appears within range. Tracking accuracy has also been improved.

**Sea Zenith**

Sea Zenith is a four-barrelled 25mm gun system made by Conraves-Oerlikon and is named for its ability to bear on targets at the zenith by virtue of a slanting two-axis mount which is inclined at 35° to the horizontal. The four 25mm guns have a combined rate of fire of 3,400rpm/min, each gun being independently fed from ammunition drums mounted below decks or by the side of the gun. The ready-to-use supply of 1,600 rounds is normal engagements of ASM targets. It uses special ammunition with a forged tungsten core designed to ensure that a single shot will be sufficient to destroy a missile target by detonating in warhead. Guidance for a Sea Zenith mount is provided by a separate yet exclusive fire control radar linked to a Sea Zenith fire control system which usually controls three mounts.

Some 24 Sea Zenith systems have been sold to Turkey and used aboard the ‘Yavuz’ (MEKO 200) and ‘Barbatus’ (MoSifid MEKO 200) class frigates.

**AK-630**

Having developed many of the early ASMs the Soviet Navy was conscious of their lethality. During the late 1950s and early 1960s Soviet ASMD was based upon a combination of guns and electronic counter-measures equipment but it was soon recognised that a more active defence was required.

Like the West, the Soviet Navy decided the most efficient means of countering ASMs that had leaked through the air defence screen was a radar-controlled gun with a high rate of fire. Development was authorised in July 1963 for a Gatling gun system known as the AK-23. However, testing did not begin until 1964 and it was not until 1976 that it was formally accepted into service, with its separate radar illuminator and fire control system, as the AK-630.

The 30mm AK-630 CIWS consists of a multi-barrel, high volume of fire Gatling gun system, a separate fire-control radar and a below-deck control station with remote optical and/or electro-optical sensor. The mount uses a water-cooled, six-barrelled AO-18, a Gatling gun weapon with fixed breechblock and revolving
The Russian AK-630 30mm vs. 30mm Kortik gun CIWS. The SA-630 has been superseded by the Kortik/Kashtan but is still an effective and widely used CIWS.

barrels. The magazine contains 2,000 rounds of HE-1 and HE-T ammunition. The AO-18 weights 205kg and has a cyclic rate of fire of 4,000 to 5,000 rounds/min and a muzzle velocity of 900m/s. The gun fires bursts of up to 40 rounds at a time during which both the barrel and the breechblock are cooled.

Unlike Phalanx the AK-630 features a separate radar director, the MR-123 Vypam (NATO code name "Bas Tilt") which is an H-band (6 to 8 GHz) system with its director mounted on a pedestal and its antenna with a drum-shaped radome somewhere on the ship.

Some 150 AK-630 gun mountings have been ordered or produced and the system remains in production.

Kashtan

The land-based self-propelled 256M Tunguska self-propelled anti-aircraft system entered service with the Soviet Navy in 1986 as a replacement to the successful ZSU-23-4 self-propelled anti-aircraft gun. The 256M consists of two radar-directed 30mm guns supplemented by a new short-range air defence missile system, the 3M11, which has been given the NATO designation SA-19 'Grison'.

The Soviet Navy was quick to see the potential of the 256M Tunguska as a CIWS to replace the AK-630. However, there would need to be radical changes to modernise the system. While the SA-19 'Grison' was retained, the need for higher firepower against incoming missiles dictated the replacement of the original single barrelled 30mm guns from the Tunguska with the AO-18 Galung gun used in the AK-630, while the more taxing sea environment dictated new sensors and weapon control electronics. The new system was known as the 3M87 Kortik and received the NATO designation CADS-N-1 (Close Air Defence System-Naval-1) with the missile system, now a naval weapon, designated as the SA-N-11 'Grison'.

Production of the Kortik ceased in 1994 but it is still marketed today as the Kashtan. The difference between the two mounts lies in the guns. The Kortik uses the AO-18 Galung gun while Kashtan uses the two 30mm single barrel guns used by the 256M Tunguska.

The system is secured on a deck mounting on which it can turn 360° in azimuth. It is 2.25m high and has a swept radius of 2.76m. The total weight of the mounting is 13.5 tonnes.

The Kortik/Kashtan is designed for point defence against ASMs and guided bombs to distances up to 4.5m (8km). It can be used by ships as small as 400 tonnes. The system is designed to engage targets with the SA-N-11 at distances from 0.75m (1.5km) onwards (out to 8km) and can use it on targets below 1500m down to 500m.

Above each AO-18 gun is a mounting for four launch containers for the SA-N-11 'Grison' missiles. The SA-N-11 'Grison' missiles have 9kg warhead consisting of a 9mm rod that is 600mm long which splits into 2 to 3 gram pieces when detonated by the proximity fuse which, in turn, is activated when the missile is within 5m of the target. The sensor fits differ from 256M with the 30mm tank radar replaced by the 3M87 (NATO designation 'Hot Flash') which features two paraboloid antennas. The search radar, to detect and track skimming missiles, is mounted in the centre of the mount while the to the right the missile guidance radar. The transmitter and receiver electronics are mounted behind the antennas.

The left of the central radar antennae are two electro-optic sensors which consist of an IR tracker and a remotely operated TV camera.

Some 30 of these systems were produced for the Russian Navy but production has ceased. Kashtan continues to be marketed for export and at least half-a-dozen have been sold to India.

Goalkeeper

Like the U.S. Navy Royal Dutch Navy (RNLN) drew up a requirement for a very short-range air defence system for its ships just after the EIHAT incident.

From 1976 the Dutch firm Signaal began to develop the SGT870 which combined a Dutch target acquisition/tracking system, a GAU-8/30A multi-barrel gun and an EX-83 mounting.

A prototype was completed in 1981. In 1983 the system, named Goalkeeper, was ordered by the RNLN. The following year it was also ordered by the Royal Navy.

Goalkeeper is an autonomous CIWS in which the entire engagement sequence from search to destruction is carried out automatically. It consists of a Sea Vulcan 30mm (GAU-8/A) gun, an I-band search radar, an I/K-band tracking radar and a TV camera.

The Dutch 30mm Goalkeeper CIWS is a very short range air defence system designed to be used in a ship's air search radar. When an ASCM is detected and confirmed as a target, the Goalkeeper is ready to engage the target at distances of between 500 and 1,500m.

The system's effectiveness is further enhanced by the use of a heavy mount which is far more intrusive into a ship's deck and as reliable as most other CIWS.

The Goalkeeper's ready-to-use magazine has capacity for 1,100 rounds carried in a linkless system using a fixed and storage drum. The ammunition capacity is claimed to be sufficient for several target engagements before reloading is necessary. The turret is 3.41m high and 5.26m wide with deck penetration of 2.8m. The gun mounting is 6.8t (reloaded) while the remainder of the below-deck equipment weighs 3.75t.

The system has been tested against missile targets flying as low as 5m. Digital fire control processing, including curved path prediction, is used to predict the point of impact while automatic calibration and closed-loop correction are used to compensate for errors, including inaccurate ballistic data. There is an automatic kill assessment subsystem for use in case of multiple attacks to optimise the system's effectiveness.

Meroka

The Spanish Navy began to examine the options for a CIWS during the early 1970s and by 1975 began to consider a system based upon a 20mm gun being developed for the Army. By the end of 1975, Barzan had received a contract for the mount and system integration and a prototype appeared in 1977.

The Meroka consists of 12 barrels arranged in two connected rows and with a common breechblock. The 12 barrels form a single unit which is trained and elevated as with a conventional weapon and whose mechanical rigidity is aided by four steel bands. The outer bands are adjustable to allow the barrels to be either coned or spread for greater effect. Ammunition is provided by two belt feeds which are supplied from a hydraulically powered rotating magazine with a capacity of 720 rounds.

A pulse Doppler tracking radar is fitted on top of the weapon mount which is supplemented by a low-light TV camera housed to the gun axis and may be used if the tracker radar is out of action.

When an ASM target is detected by the ship's air search radar the data is passed to the Meroka fire control computer which begins tracking and designating a Meroka gun for the engagement.

Conclusion

As can be seen, gun CIWS's are developing to a point that require ASM manufacturers to either redesign missiles to avoid the accurate high rate of fire of the modern CIWS or possibly withstand its effects. It is thought for some time that 20mm CIWS's would not be powerful enough to destroy some of the Soviet ASM's due to their speed. Indeed, it is a considered belief that 20mm CIWS's, even if they do not destroy an incoming ASM, may not do so at a range that precludes debris from the ASM damaging and potentially mission-killing the ship, particularly as at sea repair ships are not very rare in modern navies. Fortunately this belief has not been tested in combat but systems such as Phalanx and Meroka have addressed these concerns by increasing the accuracy, rate of fire and range at which ASM engagement can take place.

Within two seconds of designation the Meroka is facing the target. The Meroka's tracking radar acquires the target at a range of some 2.5nm (5km). The electro-optical sensor is used to confirm target acquisition as well as confirming its identity while ballistic and interception prediction data are processed by the computer. Within 2.5 seconds the weapon is ready to engage the target at distances of between 500 and 1,500m.

The non-acceptable 12 20mm barrels of the Spanish Meroka CIWS.

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This article first appeared in Asia-Pacific Defence Reporter (APDR) magazine a year ago but has been amended by the author and reproduced with the permission of the Editor of APDR.
The 1942 Channel Dash

At 2245 hrs on 11 February 1942 the Kriegsmarine (German Navy) began Operation Cerberus. The German battlecruisers SCHARNHORST and GNEISENAU, accompanied by the heavy cruiser PRINZ EUGEN, sailed from the French port of Brest, in an attempt to traverse the English Channel and reach the relative safety of German ports. By the time the three ships were in German waters on 12 February, the infamous "Channel Dash" was history. The British, who had anticipated such a move in the weeks before, were left embarrassed by their inability to stop them.

After conducting successful operations in the Atlantic, the German battleship SCHARNHORST and GNEISENAU arrived at Brest in March. There they waited for other Kriegsmarine units to arrive from Germany. The intention was to form a powerful surface-raiding group that could attack UK-bound convoys in conjunction with U-boats. For various reasons this never happened. On 6 April 1941, an RAF Beaufort aircraft located the Scharnhorst and Gneisenau at Brest on 28 April. March, a major air campaign was conducted to damage the ships, but they were not sunk. The Royal Air Force had been busy during this time. After the failure of Operation Rhine in early 1941, SCHARNHORST and GNEISENAU arrived at Brest on 28 March. A major air campaign was conducted to damage the ships. The air attacks succeeded in immobiling them, a fact not known to the British. PRINZ EUGEN, having avoided enemy action after the destruction of BISMARCK, arrived at Brest on 1 April. A major Fleet of naval base, Brest offered excellent facilities for Kriegsmarine ships. But because of its proximity to the British Isles, the port was exposed to constant surveillance and air attacks.

To plan for a possible attempt by the ships to return to German waters, Operation Feller was drawn up on 24 April 1941 by the British. Until TIRPITZ sailed for the Norwegian port of Tromsø on 1 January 1942, the battlecruisers and destroyers were stationed at Harwich to act as 'short notice' reinforcements. The Home Fleet was stretched in the face of convoy commitments and the possible threat of the TIRPITZ. Hitler compared the risk of running the British forces to provide air cover at any one time while the ships were in the English Channel, while General Martin, in charge of the Luftwaffe radar effort, planned to jam British radar stations during the operation. On hearing these plans Hitler remarked that the air threat was exaggerated, and that British forces would not be able to react fast enough to stop the ships from making it to German waters. The Kriegsmarine assigned six destroyers for the heavier ships, as well as co-ordinating escort duties by German schnellbooten (E-Boats) along the Channel. SCHARNHORST, GNEISENAU and PRINZ EUGEN had extra anti-aircraft guns mounted, the latter alone had 60mm gun added. Air search radar were mounted on each of the major ships and they were assigned a Luftwaffe officer to liaise with the air cover.

On 6 April 1941, an RAF Beaufort forced the British to change their plans. The Royal Air Force had been busy during this time. After the failure of Operation Rhine, the Kriegsmarine was able to return to German waters. The German battleship SCHARNHORST

The German battleship SCHARNHORST

The German battleship GNEISENAU on sea trials.
very heavy and low cloud offering at best poor visibility. From 0800hrs reports arrived about increased Luftwaffe activity to the Channel but they were dismissed as standard operations by the RA F. At 0920, the Germans began efforts to jam the British radars along the South Coast. Given this unusual behaviour, a second part of Spittlers was sent to investigate the coast between Boulogne and Fecamp at 1020hrs. By 1045hrs the radar station at Hastings had reported to VADM RAMSAY that a group of ships was located 27 miles away at Cape Griz Nez and beaming east. Although the radar station could not identify individual units, it was clear from the signal that there were large ships in the group.

With this information RAMSAY ordered both the RA F and the six Swordfish biplane torpedo bombers of 825 Naval Air Squadron at RAF Manston, a alert. On returning from Fecamp, the second part of Spittlers reported spotting a convoy of up to 30 vessels, but there was no mention of SCARNHORST, GNEISENAU or PRINZ EUGEN in the report that reached Ramsay at 1105hrs. Strict radio silence meant that German aircraft had landed that they could report that one of the convoys was a possible capital ship.

The German cruiser PRINZ EUGEN, PRINZ EUGEN was reported to have had a harrowing experience during the war which included a number of encounters with the British. Before Operation Cerberus, she had been transferred to the Battlecruiser Division of the Kriegsmarine and had deployed to the Atlantic for a long period.

At the same time, two senior RA F officers, Group Captain BEAMISH and commanding officer of the RA F 1 station at Kenley, with Wing Commander BOYD had taken off in their Spitfires on a combat air patrol over the channel in the hope of picking up a stray Hun. While in pursuit of a couple of German fighters, they met several of the more modern fighters and BOYD was forced to break off and return to base.

By 1120hrs the German task force was running at reduced speed as they proceeded through a minefield, but by 1140hrs they were clear and were working back up to 27 knots.

Meanwhile, the six elderly Royal Navy destroyers had sailed from Harwich and were proceeding south along the East Coast, coming under several air attacks. A squadron of RAF Whirlwind fighters was sent out in an attempt to ward off the Luftwaffe, but was bounced and lost four aircraft. HMS WALPOLE was set on fire by enemy aircraft and had to retire. The other five made radar contact at 1517hrs and ran in under heavy fire. They were repeatedly strafed, and HMS WORKINGTON was set on fire. The destroyers fired torpedoes, but once again the range proved too great for accurate fire. However, all the destroyers survived and returned to Harwich.

Bombard Commander joined the fray at the same time to loose no less than 242 aircraft in three waves. Visibility was by now appalling, down to 1000-2000 yards in heavy
For Hitler, this was another vindication. Once again he had shown that he knew better than his High Command. In backing Operation Cerberus he argued that the British would never be able to react fast enough and he was absolutely correct: the ships got through.

Operation Cerberus was a tactical victory for the Kriegsmarine. However, the capital ships were still well away from Allied convoys and a Commando raid a few weeks later on San Terza, which destroyed the dry-dock there, helped ensure that large German ships never again operated from the Western French port. Ultimately the U-Boats became the scourge of Allied convoys and a Commando raid a few weeks later would show that he knew better than his High Command. In December 1942, Hitler demanded that the heavy ships of the Kriegsmarine be put to sea and when Grand Admiral Raeder found out that he couldn’t change Hitler’s mind, he resigned as Commander in Chief of the German Navy. His replacement, Admiral Dönitz, managed to convince Hitler to keep Scharnhorst and Tirpitz.

As to the fate of the three main players, Scharnhorst met her end during the battle of North Cape on Boxing Day 1943 where she was sunk by the battleship HMS Duke of York. RAF bombers damaged Gneisenau in March 1942 and attempts to repair her were ultimately abandoned. Prinz Eugen survived the war and became a war prize for the United States. She was sunk during atomic tests at Bikini Atoll in 1946.

Decommissioning dates for Fremantles

The Chief of Navy, VADM Chris Ritchie, has approved the decommissioning schedule of Australia’s Fremantle Class Patrol Boats.

The first boat to go will be HMAS Warrnambool, who will begin her Paying Off Availability on August 24 and the last, HMAS Gladstone, will remain in service until 2007.

The first HMAS Fremantle Class Patrol Boats Force Element Group. Captain Peter Marshall, said his flotilla had been at the forefront of enforcing government policy on illegal immigration, civil surveillance and fisheries protection.

“They have done an outstanding job,” Captain Marshall said.

“The Patrol Boat sailors are an exceptional bunch. They are highly professional and able in a very tough environment,” he said.

“All of them are very skillful, efficient and helpful,” Captain Marshall said.

HMAS Warrnambool’s final captain, LCDR John Naven, said it was with a huge amount of pride his crew approached her decommissioning.

Flash Traffic

I’ve been on board the ‘Boof just for four months, but in that short time it’s become obvious that the crew is very proud of their ship.

CAPT Marshall said the phase in of the Armidale Class would herald an increase in availability to 3000 sea days for the patrol boat fleet, with a surge capacity of a further 800 days if required.

“We’ll have a much better gun, two larger RHHBs and will give an increase in boarding ability and their habitability will be far, far superior,” he said.

“Any sailor can tell you the Fremantles have the worst accommodation of any ships in the Fleet,” he said. “In the Armidales, all the sailors will be accommodated in four berth cabins … that will allow female sailors on board, too, instead of just female officers.”

 Decommissioning dates:

- Warrnambool, August 24, 2004
- Whyalla, November 1, 2004
- Cessnock, May 2, 2005
- Dubbo, May 2, 2005
- Launceston, August 29, 2005
- Runbury, August 29, 2005
- Geelong, September 26, 2005
- Wollongong, October 3, 2005
- Fremantle, January 2, 2006
- Geraldton, January 30, 2006
- Bendigo, April 24, 2006
- Gawler, May 22, 2006
- Townsville, September 4, 2006
- Ipswich, October 2, 2006
- Gladstone, January 15, 2007

By LEUT Aaron Mathews, NAFY NEWS

MANOORA gets five month overhaul

One of the RAN’s ‘can do’ ships, HMAS Manoora has entered the Captain Cook Graving Dock in Sydney for a five-month-long refit.

It is the first major refit for the R-850 tonne warship since Forgacs/Newsome converted her from a ‘honed’ Newport Class transport (formerly USS Fairport County) to the versatile amphibious transport that she is today.

The first major refit since 1994...
The Sea Harrier will continue to be operated for some years but eventually, probably by the end of the decade, it will be replaced by the Sea Gripen, which will go up against Russian MiG-29s and in other parts of the world, and be used as a front-line fighter. The Sea Harrier is being retired as the RAF version, could not withstand (the weight of) this engine than the RA F version, could not be adapted to the new Mk 107 jet weapon system. The Sea Harrier can operate at altitudes up to 10,000 feet, which with sister units 801 and 824 NAS is the oldest of Naval Air Squadrons - has served the Fleet Air Arm and off since 1933, distinguishing itself in the Norwegian campaign, Malta convoys and attacks on Bismarck and Tirpitz.

Post-war it saw action over Korea, flying more than 350 combat sorties without losing a single man or aircraft, and in the Suez crisis, and later few days before being disbanded in 1972. It was reformed within a decade to become the first FAA unit to operate the Sea Harrier, which it did with aplomb during the Falklands Conflict from HMS Hermes, destroying 13 Argentine aircraft.

In its lifetime the squadron has achieved some notable maritime aviation firsts, including being the first to fly jet aircraft (the Supermarine Attacker) and the first high-altitude interceptor squadron, as well as the first to be equipped with the Grammel Hellen.

The 2003 saw the squadron detached to the United States to operate 14 F-14 Tomcats at the range of the new F-14D Tomcat. "I view the new transition as an extraordinary catch," a sea rescue duty officer said. While it took hours for the operators to release the submarine from the trawler's nets, the Danes played the incident down. "Except for a damaged trawler, it was integrated GPS/inertial Navigation System, and GPS antenna and receiver from the St Andrews Land Attack Missile Expanded Response (SLAM-ER)

A delegation from the Thai Government recently visited the facilities in Cartagena as well as the Submarine Base that the Spanish Navy has in this city.

A North has been set for possible submarine acquisition by the Thai but it has been known sometime to have an interest in submarines. The Scorpene class is currently on order for Malaysia.

Ronald Reagan launches last Tomcat
An F-14 Tomcat from Carrier Air Wing (CVW) 8's Fighter Squadron (VF) 213 Black Lions, homeported out of Naval Air Station Oceana, Va., launched from USS Ronald Reagan (CVN 76), May 10, in what was the final Tomcat to leave the deck of the ship.

With a transit date to its new homeport at NAS Lemoore, Calif., scheduled for late May, Ronald Reagan will be supporting West Coast squadrons, which do not include the F-14 Tomcat.

"Just like Ronald Reagan has a lot of innovations and is the first step to the future," said Capt. Drew Brugel, RONALD REAGAN's executive officer.

Brugel started flying Tomcats in 1984. During his personal history with the aircraft, he is not disappointed to see it being transitioned out of the Navy.

"I'm not sad," said Brugel. "Having gone from F-4's to the Tomcat and seeing the benefit of getting into new technology, I view the new transition as a positive stepping stone to the next level.

The Tomcat launched off the deck, all hands were invited to the flight deck to watch it make one final flyby. "For the RONALD REAGAN's executive officer, the launch of the final Tomcat marks the leaving of the deck of the ship.

"The timelessness design of the harpoon is evident through its success in all environments and in the air and at sea," said John Lockard, the Navy, incorporates key guidance technologies from two other Boeing weapon systems - the internal measuring unit from the Joint Direct Attack Munitions (JDAM); and the software, mission computer, and GPS/Inertial Navigation System, and GPS antenna and receiver from the St Andrews Land Attack Missile Expanded Response (SLAM-ER).

There will be no adverse impact on U.S. national interest to assist Japan to develop and maintain strong and ready self-defense capability which will contribute to an acceptable military balance in the area. This proposed sale has been concluded.

There will be no adverse impact on U.S. defense readiness as a result of this proposed sale.

Law requires this notice of a potential sale does not mean that the sale has been concluded.

Lockheed Martin demonstrates Aegis open architecture

The principal contractors will be: Lockheed Martin Naval Electronics and Information Systems of Moorestown, New Jersey; Raytheon Company of Andover, Massachusetts; and Raytheon Company in Tucson, Arizona. There are no known offset agreements proposed in connection with this potential sale.

The proposed sale of this equipment and support will not require the assignment of any additional U.S. Government or contractor personnel to Japan. There will be no adverse impact on U.S. defense readiness as a result of this proposed sale.

Law requires this notice of a potential sale does not mean that the sale has been concluded.
they are introduced into RAN service in 2013. The Lockheed Martin Open Architecture team is making impressive progress," said Capt Richard T. Rechtin, the Navy’s chief for the Network Systems Integration Directorate. "The team’s innovative engineering approach and commitment to open architecture indicates we are on track to meet requirements in time.

Open architecture systems exploit commercial computing technology, allowing the Navy to install software and other systems more rapidly and more cost effectively throughout the life of a ship, aircraft or submarine. By the end of this fiscal year, next year, will upgrade the radar command and control architecture and computing environment for all SPY-1 radar systems, beginning with SPY-1D/BD. In parallel, the Aegis weapon control and display system are also being architected to operate in an open computing environment.

USN’s future warfare strategy

Northrop Grumman Corporation and the U.S. Navy have completed the first flight test exercise, the service’s warfighting goal of interconnecting sensors, manned and unmanned aircraft, ships and offensive weapons and platforms in real time to locate and strike targets.

In a demonstration held on April 14 this year, engineers from the Naval Air Systems Command and Northrop Grumman’s Integrated Systems sector used a Navy E-2C Hawkeye battle management aircraft to integrate and direct a simulated airborne early warning and control system over a network by a Navy RQ-8 Fire Scout unmanned aerial vehicle (UAV).”

The prototype icing system worked better than expected,” said Maj. Frank Conway of USMC’s Corporate Test Pilot Tom Macdonald, flew all of the icing test flights. “Other than the icing test flights, there was very little redesigning of the system done while we were in Halifax,” Maj. Conway noted that the only major configuration change engineers are implementing for icing is the detection probe to provide the simplest feedback to the pilots.

V-22 completes icing trials

Osyprey No. 24 returned to the US Naval Air Station Patuxent River on the afternoon of April 29 after spending six months conducting aircraft icing tests from the E-2C Hawkeye.[11] The aircraft arrived in Newport News, Va. A joint effort of the Commonwealth of Virginia, the City of Newport News and Northrop Grumman’s Newport News sector, VASCIC is a ‘proving ground’ for complex FORCEnet requirements.

The accumulation of ice on flight control surfaces has always been a potential hazard to aviators. The rapid build up of ice on wings can dramatically change an aircraft’s flight characteristics, in extreme cases rendering it unsafe. Generally, pilots don’t fly in ice. Because of the nature of the V-22’s mission — rapidly getting combat troops and supplies where they are needed — Osprey crews may not always have the luxury of avoiding bad weather. As a result, the Osprey has a requirement for a robust and ice tolerant icing and anti-ice system.

The detachment was extremely successful,” said Don Byrne, who alternated Integrated Test Team (ITT) Test Director responsibilities with the ITT’s Paul Gambartico. “We cleared all laboratory, flight and ground water conditions, so now we’re able to fly for extended periods of time in all weather conditions."

ARMIDALE on the way

Production has commenced for the RAN’s Armidale Class patrol boats which will form the line of defence for Australia’s maritime boundaries. To be built in Western Australia over a 42 month period, the 12 vessel fleet will act as the RAN’s first line of defence and response element of Australia’s National Civil Surveillance Program.

Project partners Austal Ships and Defence Maritime Services (DMS) held a ceremony recently attended by Senator David Johnson, Senator for Western Australia, representing the Minister for Defence, and Minister for Defence Materiel Organisation and Defence Materiel Command Captain Peter Marshall, to mark the start of production of the first ship in the class.

HMAS ARMIDALE

The city and towns with close links to RAN history will lend their names to the fleet with HMAS ARMIDALE to be launched in January and delivered in April 2005. The second and third Armidale Class vessels will follow six months later.

Mr John Rothwell, Executive Chairman, Tenix Defence Pty Ltd, has designed and will build the vessels, said much research and technology had been invested into the project. "The protection of Australian interests, and the benefit from the superior performance of the Royal Australian Navy’s Armidale Class patrol vessels, represents the largest defence contract ever awarded in Western Australia," he said.

The fleet, with a total contract value of approximately $550 million, will primarily carry out surveillance, interception, investigation, apprehension and the escort to port of vessels suspected of illegal fisheries, quarantine, customs or immigration offences.

Mr Ross Brewer, Chairman of DMS, which was the successful tenderer and will manage project requirements and construction, said it was a great day throughout their operational lives, praised the features of the Armidale Class fleet. "The vessels will provide a powerful deterrent to potential threats and sea keeping and reduced through-life costs when compared with the Fremantle Class vessels they are replacing. The Navy is pleased that Tenix has facilitated the schedule for the timely delivery of vessels and we look forward to seeing the entire fleet in operation," he said.

Based in the ports of Darwin and Cairns, the Armidale Class fleet will operate to the limits of Australia’s exclusive economic zone. The vessels are capable of being deployed in the warm and sea and weather conditions of Australia’s northern waters as well as the Southern Ocean, such as the South Tasman Ridge which is 300 nautical miles south of Tasmania (45S). The vessels will also be capable of deployment to Christmas and Cocos Islands and to other countries in the region for occasional exercises and cooperative operations.

BALLARAT delivered to RAN

The RAN has taken delivery of the Australian-designed frigate, NUSHIP BALLARAT, during a ceremony in Williamstown, Melbourne, on April 30.

With the Ship’s Company in attendance, Tenns Managing Director Paul Salters handed over the vessel to Director General, Major Surface Ships, Commodore Keith Malcom and Commander of BALLARAT, Commander David Hunter.

Built by Tenix Defence Pty Ltd at the Williams town shipyard, the ship has advanced technology and a range of capabilities enhancements uniquely to Australia. The 17-year fixed price contract is worth $570 million and is the most successful defence project ever awarded in Australia.

It is providing long-term benefits for the company and both sides of the Tasman involving about 300 companies with 75 per cent local industry content and providing 8,000 local jobs.

The keel of BALLARAT was laid on 4 August 2002 and she was launched on 25 May 2002. The ship is scheduled to be commissioned into the RAN in mid 2004.

BALLARAT is the second RAN ship to bear the name of the city of Ballarat. It follows the first HMAS BALLARAT, which was launched in December 1940 as one of 60 Mineweeping Corvettes. It served with distinction during WWII and is known for rescuing Flying Officer J.G. Gorton RAAF, who later became Prime Minister of Australia.

The 10th and final Anzac class ship (PERTH) is scheduled to be delivered by mid 2006.
SPY-3 active

The U.S. Navy's first shipboard active phased-array radar program, AN/SPY-3, successfully achieved a significant performance milestone recently during testing at the US Navy's and Italian Test Site at Wallops, Va.

The Raytheon-designed radar performed precision track of a low altitude HMG target drone during multiple inbound and outbound flight legs. The SPY-3 is being developed as part of the DD(X) program, headed by Northrop Grumman Ship Systems.

The SPY-3 is an active phased array X-band radar designed to meet all horizontal and vertical fire control requirements for the 21st century fleet. The multifunction radar combines the functions provided by more than five separate radars currently aboard Navy combatant ships. SPY-3 supports new ship-design requirements for reduced radar cross-section, significantly reduced manning requirements, and total ownership cost reduction. The SPY-3 radar is being designed for the DD(X) class of surface combatants, the transformational aircraft carrier CVN-21, and the US Navy's next-generation amphibious warfare ships. Raytheon serves as a subcontractor to Northrop Grumman Systems Integrator (NGDI) as a subcontractor to Northrop Grumman Ship Systems.

Development of the SPY-3 began in 1999 and was delivered to the Navy's test site in early 2003 for its two-year testing program. Work was performed at Raytheon's Integrated Air Defense Centre in Andover, Mass., its Surveillance and Sensors Centre in Sudbury, Mass., and its Integrated Defense Systems Headquarters in Tewksbury, Mass.

RN MK 8 receiving long-range rounds

British warships will be able to fire more powerful shells at targets on land at much longer ranges, following the entry into service of improved ammunition. The new shell was specially designed for bombardment of targets in support of land forces. It has a range up to 27 kilometres – an improvement of some six kilometres or more than one quarter on the shell it succeeds in service.

HMS RICHMOND, a Type 23 frigate, will be the first warship to carry the new ammunition. A total of 26 ships equipped with the Mark 8 gun, and the new Type 45 Destroyers, due to enter service later this decade, will use the new improved ammunition.

UK Defence Procurement Minister Lord Bach said: “Expanding the range of our warship’s main guns with these new and more effective shells will greatly increase the Royal Navy’s ability to engage land targets in support of our troops. Additionally, it will reduce exposure of our ships to hostile fire. The continuing importance of naval gunfire support and complements MoD expenditure on upgrading and updating the 4.5 inch gun itself.”

USS KITTY HAWK turns 43

USS KITTY HAWK (CV-63), currently the navy’s only permanently forward-deployed aircraft carrier, turned 43 years old April 29, with an under way case-cutting ceremony to celebrate the beginning of the life in America’s oldest active Navy ship.

“USS KITTY HAWK has now served under nine presidents,” said Capt. Thomas Parker. “KITTY HAWK’s commanding officer, as he cut the ship’s birthday cake in the all mess decks. “Construction started on September 19, Eisenhower was president and concluded when Kennedy was president.”

Parker also pointed out that KITTY HAWK has had 33 commanding officers, including himself and had conducted 375,157 successful aircraft trap attempts at the time of the ceremony.

The ship is like a fine wine, it doesn’t get older, it gets better,” he said. Standing alongside Parker as he cut the cake was Capt. John ROUTH, KITTY HAWK Sailors who shared the same birthday as the ship. April 29, some of whom said they felt great pride at being honored guests at the ceremony.

USS KITTY HAWK was commissioned at the Philadelphia Naval Shipyard April 29, 1961. It is the second U.S. Navy ship named after the town near which Orville and Wilbur Wright flew the first-ever successful powered aircraft Dec. 17, 1903. USS KITTY HAWK’s original homeport was San Diego.

Since then, USS KITTY HAWK has participated in operations around international hotspots, such as Vietnam, Korea, the Persian Gulf, the Balkans, Afghanistan and most recently, the war in Iraq.

USS KITTY HAWK took over the mantle of being America’s only permanently forward-deployed aircraft carrier in the Pacific Ocean and is currently conducting operations during its Spring 2004 under way period.

Nuke submariners put ashore

Eleven British sailors were allowed to leave a nuclear submarine after they expressed fears over its safety. The crewmen on HMI TALISMAN raised their concerns with the commanding officer who agreed to let them off the boat. A MoD spokesman denied any suggestions of a mutiny on board and said no individual refused to sail with the submarine. The incident took place before the submarine was due to begin operational tests following minor repairs at the Faslane nuclear base, in Scotland.

HMS TRAPALGAR has been out of service since it ran aground off the Isle of Skye, off Scotland, in November 2002. Three sailors were injured in the incident, which caused five million pounds worth of damage.

A temporary replacement crew joined the other 109 members last week after the 11 men spoke of their safety fears last day to commanding officer Mark Williams who agreed to release them from duty.

Disciplinary measures are currently being considered against the 11 men, the MoD added.

A court martial hearing last month recommended Commander Robert Payne and Commander Ian McGhee, both 39, for their part in causing HMS TRAPALGAR to ground on the seabed while on a training mission.

The two pleaded guilty to a charge of negligence causing the grounding of the submarine on November 8, 2002.

First fuel cell sub for export launched at HDW

Under the name PAPANIKOLIS, the first 212A Class fuel cell submarine was launched from Howaldtswerke-Deutsche Werft AG (HDW) in Kiel.

The submarine, with the construction number 361, is a 212A Class submarine and has been built for the Greek Navy.

The HDW group is building a total of four of these submarines for the Greek Navy. Of these, the first vessel is in Kiel and the subsequent vessels will be built at the HDW subsidiary company Hellenic Shipyards in Greece. The submarines are scheduled for delivery between 2005 and 2010.

The 214 Class of submarines is based on the successful construction of the 209 Class submarines of which HDW have built more than 60 since 1960. It was improved by incorporating the innovations of the 212A Class submarine, especially the unique air-independent fuel cell propulsion system. This provides extremely increased underwater endurance. The minimised acoustic, thermal and magnetic signature of the submarine provide an unbeatable degree of undetectability. Increased diving depth and overall efficiency provide new operational advantages.

German shipyards to build Portuguese subs

On 21 April 2004 in Lisbon, the German Submarine Consortium GSG signed a contract for the construction and delivery of two 209 PN Class submarines and an option for a third vessel. The client is the Portuguese Government.

The contractor is a consortium consisting of the two shipyards Howaldtswerke-Deutsche Werft AG, Kiel (HDW), Nordseewerke GmbH, Emden (NSWE) and Ferrostaal AG, Esret (FS).

The size of the order amounts to about 800 million EUR.

In addition to the construction contract, a comprehensive counter trade package was also agreed in an offset contract.

The 209 PN Class submarines are specially designed to meet the requirements of the Portuguese Navy and represent state-of-the-art submarine technology. The vessels, which are some 65 metres in length, have a displacement of 1,700 tons and are equipped with an anti-submarine and anti-surface warfare system. Delivery of the vessels is scheduled to take place in 2008 and 2010.

In obtaining this contract, the German shipbuilding industry is once again demonstrating its position as world leader in non-nuclear submarine construction.

UK purchases enhanced Tomahawks

The UK Ministry of Defence has reached agreement with the United...
Taiwan considers ex-USN Spruances

The Taiwanese Navy is considering buying retired US Spruance-class destroyers from the US to replace its Knox-class frigates for anti-submarine warfare (ASW), defence sources said recently.

The plan is very likely to materialise because the US Navy has retired most of its Spruance-class destroyers in recent years, and some naval leaders have made them available for use.

The Spruance-class destroyer, which uses the same hull as the Kidd-class destroyer about to enter Taiwanese service, is expected to replace the Knox-class frigates for ASW. Both the Spruance and Kidd have a displacement of nearly 9,000 tonnes.

The Taiwanese Navy has a total of eight Knox-class frigates, which have been in use since 1982. After serving for over 10 years, they are no longer capable of sustaining a heavy workload. All eight ships had been in use in the US Navy for around two decades before they were delivered to Taiwan on a lease contract before the navy bought them.

Despite being in bad condition, the Knox ships are still the Navy's most powerful ASW platforms.

The Navy has yet to make a final decision on the purchase of the Spruance-class destroyers since there are still different opinions within the service on the matter.

Not all naval leaders are in support of the plan to buy the Spruance-class destroyers. One group of flag officers argued that the Navy must purchase frigates with a displacement of 2,000 tonnes or less. For more than a decade, the Navy has been thinking of purchasing smaller ships to establish a high-low mixed force structure, which is a combination of larger and smaller warships to cover a wide range of combat duties.

But if the Spruance purchase plan is passed, the Navy's dream of having a heavy payload ship, the Knox, could be dashed.

Retired Vice Admiral Lin Lien-lu, a former Navy Deputy Chief of Staff, said it would be good for the Navy to buy the Spruance ships, considering that they can carry a heavy payload.

"The Spruance has the most powerful ASW equipment. It has the same hull as the Kidd. The Navy's plans for four Kidds, which are to be delivered in the next few years, are to use them mainly for air defence," he said.

But the Spruance class will play the leading role in ASW. Besides being powerful in ASW, the Spruance is also large enough to accommodate equipment to be removed from the Knox ships after their retirement.

Erich Shih, a Senior Editor with Defence International magazine, said if the Navy chose to buy the Spruance-class destroyers, it would need to buy four ships to replace its eight Knox-class frigates.

Malaysian submarine program on track

Plans to acquire two Scorpene-class submarines for the Royal Malaysian Navy are progressing on schedule, a senior official of Malaysia's submarine program said recently.

Philip Nogenti, the Malaysian Program Director of Armuris Submarine Business Unit, said the first submarine would be delivered in early 2008 and the second in the middle of the same year. Armuris is the French main contractor for Malaysia's submarine program.

"Everything is going on smoothly. We'll deliver the submarines on time as promised," he told Bernama at the Defence Services Asia 2004 Exhibition in Subang.

The Malaysian Government signed a contract in June 2002 for the purchase of two new Scorpene-class submarines for the Navy costing 1.04 billion Euro ($1.5 billion) under a 10-year rolling plan. The new generation medium-size submarines are being jointly built by the French shipbuilder DCN and its Spanish partner IZAR.

A ceremony to mark the construction of the hull assembly of one of the two Scorpene submarines was held at the Naval Shipyard in Brest, France, in December last year.

To reinforce its long-term ties with the RMN, Armuris has opened a regional office in Kuala Lumpur.

Tenix going Dutch for RNZN ship

New Zealand's newest and most expensive Navy ship will be built in the Netherlands. Tenix, the Australian defence contractor named preferred bidder for the NZ$550 million contract to build new ships for the Navy, said it would contract out the multi-role ship to a Dutch yard.

Tenix Corporate Affairs Manager Liam Bathgate said Merewe, Shipyard would build the 8,000-tonne ship, which would be sailed to New Zealand under its own steam for a final fit-out.

Tenix's existing facilities could handle the ship, but the Dutch yard offered the best option. "It makes the best use of the facilities available within our order book," he said.

The navy's order book is currently filled to the end of 2009, with three new diesel-electric submarines (the first of which will be delivered in 2006), a new mine warfare vessel and a new anti-submarine warfare patrol vessel.

The dry dock was the installation of four new diesel generators, the vertical launch system housing (including ram and reinforcement through four decks and air-conditioning plant. Also installed was combat system equipment including new mine avoidance sonar, electronic support and all upgraded fire control system hardware. ADI built a 3D model of the forward part of the ship enabling any potential system interference to be designed out.

Tenix will also build two 1,500-tonne offshore patrol ships and four 350-tonne inshore patrol ships for the navy.

The Australian business subcontracted much of the work on the Anzac frigate project to New Zealand firms and plans to do the same this time. "We will be using New Zealand companies to the maximum extent possible," Mr Bathgate said. Now Tenix is the preferred bidder, a final round of negotiations will take place.

FFG Upgrade milestone achieved on schedule

ADI Limited's FFG Upgrade Project has entered the next phase of production following the on schedule undocking of HMAS SYDNEY.

HMAS SYDNEY at ADI's Garden Island dockyard after undocking of the Royal Australian Navy vessel.

HMAS SYDNEY, the first of the Royal Australian Navy's guided missile frigates to be upgraded, has been moved from dry dock to berthed at ADI's Garden Island facility in Sydney to complete the installation phase. The setting to work of the enhanced combat system has already commenced.

The Upgrade Project is not only a complex integration task that will see the FFG combat systems upgraded to ensure the ship's operational effectiveness against regional threats but the innovative nature of the platform work means ADI is effectively rebuilding significant parts of the ship to incorporate the enhancements.

Tenix corporate affairs manager Liam Bathgate said Merewe, Shipyard would build the 8,000-tonne ship, which would be sailed to New Zealand under its own steam for a final fit-out.

Tenix's existing facilities could handle the ship, but the Dutch yard offered the best option. "It makes the best use of the facilities available in New Zealand," he said.

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class will also carry more logistical support capability and be better equipped to support humanitarian and disaster relief operations than the ships they will replace.

The contract for two vessels was placed with BAE Systems in November 2000 and steel cutting began the following month.

US warships may resume refuelling at Aden

US warships might resume refuelling at the southern Yemeni Harbour this year after more than three years of continuous following the bombing of USS Cole.

“We hope US ships would resume shipping here this year,” Brig. Gen. Martin Robinson of the US-led anti-terror task force told reporters in Aden in April. He made the comments at a ceremony to officially hand over the naval port, recently supplied by the United States to Yemen’s coast guard. The US official would not confirm reports by local sources that US sailors were killed in the attack.

Yemeni officials said last week that six suspected accomplices in the suicide bomb attack would not give an exact date.

A small explosives-laden boat, led by two suicide bombers, as it was refuelling in the Aden on Oct. 12, 2000 rammed into a US warship; two US sailors were killed in the attack.

“Anzacs frigates are being similarly fitted with the missile systems under this program,” Senator Hill said.

The ships’ main line of defence is now their ESSM system. The missile is specifically designed to defeat anti-ship missile threats and subsequently significantly increases the ability of these three ships to defend themselves.

“The ESSM was procured under Project SEA 1428, a $660 Million project which delivered the first missiles to the ANZAC frigates. This capability is a step forward into the 21st Century.”

**Naval shipbuilding announcement**

Defence Minister Robert Hill and Finance Minister Nick Minchin have announced a series of decisions relating to the future of the naval shipbuilding program.

The key decisions, which follow from the Government’s consideration of commercial advice provided by independent expert Mr. John Wylie of Carnegie, Wylie & Company, are as follows:

- A significant increase in NSR sector expenditure from the Defence Capability Review, a competitive model is the preferred approach for contracting in the NSR sector with intervention by Government only in exceptional circumstances.
- The $4.56 billion Air Warfare Destroyers (AWD) build contract will be brought forward and let before the $1.5-2 billion amphibious vessels contract while maintaining the integrated delivery of the new Ship build projects set out in the Defence Capability Plan.
- It is planned that tenders for the AWD build will be issued later this year with a preferred Tenderer to be identified by early 2005. It is planned that tenders for the Amphibious vessels build will be issued in early 2005 with a preferred Tenderer to be identified by late 2005.
- Tenders for the AWD contract will be asked to bid on the basis of an alliance relationship with the Commonwealth. An alliance contract will reflect all of the key commercial principles that will govern the relationship to include sharing incentives to the parties to minimise costs. Mr Wylie will assist Defence in developing the detailed terms of the alliance relationship.
- The sale of the Australian Submarine Corporation (ASC) will be deferred until after the AWD and Amphibious vessels are in contract to allow shipbuilding industry - including the ASC - to focus on tendering for these projects. The ASC’s management will work with ASC to ensure that ASC will be sold until 2006.
- While Australia will be permitted to tender for major naval shipbuilding contracts, tenders will be on a commercial basis.

**New tanker to replace WESTRALIA**

The Navy has purchased a $50 million commercial tanker that will be reconfigured and used to replace its ageing current auxiliary oiler, HMAS WESTRALIA.

The ship, currently named DELOS, is a brand new double hulled, environmentally sustainable oil tanker. It was built in the Republic of Korea by the Hyundai Mipo Dockyard Company as part of a four-ship build program for the Greek shipping company Tsakos Energy Navigation.

DELOS is 143.3 metres long and 37,000 tonnes deadweight, the ship is similar in size to WESTRALIA,” said Minister for Defence Senator Hill.

It will be modified so that it has the latest technology and equipment capable of refuelling a range of Navy vessels, including the ANZAC and Guided Missile frigates and the new Air Warfare Destroyers that will enter service from 2013.

**Milestone for RAN’s ESSM**

The RAN has accepted ‘Operational Release’ of its three ANZAC class frigates as equipped with the Evolved Sea Sparrow (ESSM) system.

This important milestone acknowledges the ships’ ability to achieve defined operational outcomes laid down in the Defence Preparedness documentation.

**Navy Heritage Centre for Sydney**

More than 500,000 items representing a century of Naval heritage will be displayed in a new Royal Australian Navy Heritage Centre on Sydney Harbour.

The centre will be built in the public access area at the southern end of Garden Island at a cost of approximately $5 million. Work is expected to begin in January 2004.

The centre will be open to the public, free of charge, as part of the Defence Heritage and Museums Program. The centre will feature a large exhibition space, which will provide a permanent display of the heritage items.

**THE NAVY**

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COASTAL SHIPPING – DOES THE LOCAL INDUSTRY HAVE A FUTURE?

A Research Paper published in May by the Australian Parliamentary Library, "Coastal shipping overview" No 12 2003-04 has once again invited attention to the struggle for viability by Australia's shipping industry. What if any, effect the paper will have on the representatives of the people who sit in the nearby legislative chambers remains to be seen.

Numerous articles have been published in THE NAVY noting the local industry's problems and stressing the need for a healthy Australian shipping industry if ever the country was to take its place among the world's significant trading nations. The Parliamentary Library's research paper on coastal shipping is, as the title implies, confined to ships operating around the Australian coast and does not venture into the larger area of overseas shipping; nevertheless there are some common issues such as naming costs, safety and most importantly, policies of the government of the day.

The research paper is basically a statement of facts and while pointing out apparent anomalies in some current financial arrangements and suggesting a better way of doing things, does not make 1998 recommendations; it does however, contain in an appendix a summary of the key proposals of the September 2003 Review of Australian Shipping (IRAS) carried out by Peter Morris and John Sharp. Transport Ministers in Labor and Coalition governments respectively. Matters dealt with by the paper include:
- coastal shipping as component of national transport task.
- shipping industry reforms
- other reforms (port and waterfront)
- the Navigation Act and cabotage
- Commonwealth government policies
- defence

As a carrier of heavy and/or bulky cargo – iron ore, bauxite, steel, petroleum products etc - coastal shipping plays a vital part in the national transport task. The local industry however, has much to contend with, not least challenges to cabotage (a policy used in Australia and many overseas countries to limit access to their coastal trade to national operators), higher and more expensive ship standards than many foreign-owned ship operators, ageing ships and policies changing with changes of government.

In the last 20 or so years, most governments have attempted to reform the shipping industry and the waterfront:
- the Crawford Report in 1981
- the Maritime Industry Development Committee
- the Shipping Reform Task Force in 1988 and
- the Shipping Industry Reform Authority in 1989 as the overseeing body.

The proposals emanating from the various inquiries were generally adopted and resulted in a more efficient shipping industry. Other reforms in ports and on the waterfront, especially since the late 90s and implemented by Federal and State governments, have resulted in an improved industrial relations climate and greater efficiency in cargo handling.

The outlook changed again when the present government took office in 1996 and competition became a major factor in the industrial world. A shipping Reform Group was established in that year and a report from the Group in 1998 and for a time even the cabotage provisions of the navigation act appeared to be under threat: this did not eventuate but subsequently protection for local coastal ship operators was weakened by an increased issue of single and continuing voyage permits, allowing foreign-owned and crewed vessels to operate around the Australian coast.

Rather surprising was the "government's" publicly stated "Australia is a shipper nation not a shipping nation" policy, almost as though it was not possible to be both. Many nations, including Australia's trading partners Britain, Japan and the United States are traders and ship owners. Apart from liberalising the permit system a consequence of government policy has been withdrawal of fiscal support for the Australian shipping industry.

According to the research paper not all the proposals of the Reform Working Group have been made public. A notable improvement however, was the introduction in 1998 of company employment for ratings, replacing the roster system employment and enabling better conditions for seafarers.

The paper lists a number of the challenges facing the Australian coastal shipping industry including increasing competition from rail in some segments and a possible shortage of skilled seafarers. On the other hand the government's reluctance to abolish the cabotage provisions of the Navigation Act "will contain the pressure from the issue of permits". It notes "the quality, reliability and safety of Australian flagged vessels are high by world standards, as are the skills of Australian seafarers" and that "shipping has environmental benefits in terms of energy consumption".

A brief reference is made to the Australian (merchant) fleet possibly having a role in future defence and a possible shortage of skilled seafarers. On the other hand the government's reluctance to abolish the cabotage provisions of the Navigation Act "will contain the pressure from the issue of permits". It notes "the quality, reliability and safety of Australian flagged vessels are high by world standards, as are the skills of Australian seafarers" and that "shipping has environmental benefits in terms of energy consumption".

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Reports from several Rottnest-based gunners speak of the November 1941 night in which a blacked-out unidentified merchant ship was 'sprung' in Gage Roads off Fremantle. Held in the glare of battery searchlights, the 6-inch guns of the Oliver Hill Battery and the 6-inch guns of Bickley Battery, also located on Rottnest Island were trained on the vessel.

A number of former Army personnel have relayed this story to me over the years, including retired WA Electoral Office Commissioner, Mr Doug Coates, who was the gunner on one of the 6-inch guns of Bickley Battery. He has never forgotten the night, being focused on the mystery ship for hours and recalling it as the first time the high explosive shells had been brought up, this was no exercise. From a selection of unidentified photos of the ship, Mr Coates described, he without hesitation picked out a shot of the KOBURRAS.

Searchlights, rotated by the various batteries lit the ship and then were doused in case it turned out to be an allied merchantman. Eventually the ship vanished in the dark and could not be re-located. Many ex-Army personnel still believe they could have saved HMAS SYDNEY if they had been given permission to fire on that night. Who knows?

There are more claims of submarine activity off Australia's West Coast that are listed here, but they cannot be verified and therefore have not been included in the following chronology of events relating to mainly Japanese submarines in western waters. Here is a chronological list:

- 4 November 1941 - Unidentified aircraft were reported flying over Geraldton.
- 7 November 1941 - A similar report claimed unidentified aircraft were reported flying over RAFA Base Pearce. Postwar research suggests they were Japanese floatplanes launched from submarines known to be offshore at that time.
- 5 January 1942 - The telephone in the Signal Distribution Office on the first floor of the District Naval Office in Fremantle received and began to print out a signal from the 816-ton Netherlands General cargo ship SS TANIMBAR "SSS 1330 10920 TANIMBAR". The attack was carried out 40 nautical miles south of Tjilatjap by the Japanese submarine I-156.
- 11 February, 1942 - At 0505 Western Standard Time the following was recorded in the log of the South West Area Command Headquarters in Fremantle: "From Navy Report crossing No 1 loop very good reading and no surface could have made same. Wing Commander McLean notified and ordered an anti-submarine patrol and a search."
- 13 February 1942 - The Imperial Japanese Navy submarines I-2 and I-3 commenced patrols off the West Australian coast.
- 27 February 1942 - In a morning attack in rainy conditions and poor visibility, the Japanese submarine I-3 allegedly fired a torpedo at a merchant ship departing Fremantle which fortunately missed. The ship would have been the Burra-Phillip MARIA which departed at 0705 from the Blue Funnel Line's DECELAXION which sailed one hour later.
- 1 March 1942 - The small 1172-ton Dutch cargo ship PIRU was torpedoned and sunk by I-2 off Fremantle. The ship was reported missing one month later.
- 2 March 1942 - For the next several days the Japanese submarine I-3 monitored the shipping movements of vessels arriving and departing Fremantle. Positioned off the Perth coastal suburb of Cottesloe to the north of the Port of Fremantle's inner harbour to monitor shipping movements, the submarine submerged during daylight hours and surfaced at night.
- 2-3 March 1942 - The 8908-ton passenger/general cargo ship SS XARRUDA signalled RAFA Base Pearce repeated to Central War Room in Melbourne "Cargo ship SS XARRUDA being attacked by submarine, position 31 degrees 33S 113 degrees 11E Hudson lumber aircraft to locate and attack submarine. This position was 90 nautical miles WNW of Fremantle."
- 3 March 1942 - 0200 - Signalled RAFA Pearce with message repeated to Central War Room - message received from XARRUDA begins "Shelled by submarine, returned fire, submarine submerged, possibly hit, proceeding on voyage." The submarine involved was the Japanese I-3.
- 3 March 1942 - A torpedo and gunfire attack saw the Japanese submarine I-1 sink the 8000-ton Dutch steamer SANFAR several hundred miles NW of Shark Bay.
- 6 March 1942 - The Japanese submarine I-3 was patrolling off Shark Bay.
- 11 March 1942 - The New Zealand Shipping Co. 8719-ton refrigerated and general cargo vessel TONGAORI reported a Japanese submarine gunfire attack with no hits at 1105 to the Applecross Wireless Station in Perth: "In position 33 degrees 48S, 113 degrees 20E - Being chased by submarine heading North East, speed 13/14 knots.
- 13 March 1942 - The patrol vessel USS GILES reported sighting a Japanese submarine 55 nautical miles SW of Geraldton.
- 28 April 1943 - The USS WHIPPOORWILL, obtained a strong contact with a possible indicator loop crossing in the approaches to Fremantle.
- 16 May 1943 - USS WHIPPOORWILL dropped six depth charges on contact with an unidentified object off Fremantle.
- 27 June 1943 - Unidentified vessel crossed the indicator detection loop in the approaches to Fremantle.
- August-September 1943 - The Japanese submarine I-165 and 1-166 operated off Fremantle monitoring shipping movements through the busy port.
- 8 November 1943 - The patrol vessel USS ISABEL dropped three depth charges after good contact with unidentified submarine crossing the indicator detection loop in the approaches to Fremantle.
- 6 February 1945 - The US merchant ship SS PETER SYLVESTER was torpedoed by the German submarine U-862 some 800 nautical miles west of Fremantle.
- There are other claims relating to Axis submarines off Australia's west coast during World War II and I have no doubt a few may just hold a grain of truth. There obviously was strict security in those dark days and reports of submarine incidents were shrouded in secrecy.

If reports of the actual incidents listed do exist perhaps it is time to consider making them public as an important contribution to Australia's military history before they are simply lost in the mists of time.
Electric Warship Heralds

Evolution in Weapon Technologies

The US Navy's first integrated electric power system/electric drive warship, the DD(X), arrives in 2011. It is expected to have a surplus of electrical power that will enable the development of advanced weapons, such as free electron lasers, high-powered microwaves and electromagnetic rail guns. The ability to leverage advanced weapon technologies is one reason why naval engineers liken the advent of the electric warship to the shift from sail to steam.

When the US Navy's first integrated power system (IPS)/electrostatic drive warship arrives in 2011 as the DD(X), the service will mark a technological breakthrough that not only signals a new era for naval engineering, but provides huge amounts of electrical power for uses once considered fanciful, such as free electron lasers, high-powered microwaves and electromagnetic rail guns.

Capt. Roger D. McGinnis, director of the US Navy's directed energy and electric weapons program office, said that while the "lethality mechanisms" of high energy weapons are classified, "Our bottom line is that if we can put millions of joules of energy onto a target, something will happen."

In an interview with SeaPower, McGinnis described a variety of effects from these weapons, including "the burning of electrical power. It is expected to have a surplus of electrical power that will enable the development of advanced weapons, such as free electron lasers, high-powered microwaves and electromagnetic rail guns. The ability to leverage advanced weapon technologies is one reason why naval engineers liken the advent of the electric warship to the shift from sail to steam.

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collateral damage. That lets us engage units that are close to acquisition of a I PS/electric drive is like "the shift from sail to..." other Navy leaders, such as Rear Adm. Charles S. Hamilton II. potential these technologies require, according to Collins and...make the enemy go away." McGinnis said. the 32-gun Demologos, designed by Robert Fulton, was launched in New York...Demos was scuttled when its magazine exploded in 1829 - contrasted sharply with the most advanced sail frigates of its day, and though understood under the naval establishment, it's the way to the future. It took almost two generations for James Watt's practical improvements on Savery's and Newcomen's steam engine in 1769 to inspire the first steam-powered war ship. IPS/Electric drive, itself not a new concept, may have come of age. The Type 23 uses a combined gas turbine, diesel-electric propulsion system. It uses gas turbines for speed and diesel generators powering electric motors for...Tactical and its partners are working with the Navy under a $2.9 billion contract for DDX) that includes the design, manufacture and test of 10 engineering development models. IPS/Electric drive is one of those models. The system will provide 78 megawatts of power to produce electricity propulsion and all of the ship's systems, including advanced sensors and weapons. Though significant technological and funding challenges...ship's propeller shaft. Because gas turbines operate more efficiently at higher shaft revolutions, prime movers in an IPS/electric system can be revved up to their most efficient level of operation and remain there. Electric motors are used to change the ship's propeller speed. Fuel economy is a key reason why the Navy is investing in IPS/Electric drive.

The U.S. Navy experimented with electric drive in 1911 with the ex-USN JUPITER - converted in 1913 as USS LANGLEY, the first aircraft carrier. Ordinary vessels are operating today with forms of electric drive. For example, the U.S. Coast Guard Cutter HEALY, built in 1993, is an electric drive vessel powered by diesel prime movers. The Royal Navy's Type-23, new Type-45 and new aircraft carrier programs are designed with IPS/Electric drive type systems in mind.

Development Continues

The Naval Surface Warfare Center, Carderock Division's, Ship Systems Engineering Station in Philadelphia has been putting Danzig vision for a new state-of-the-art IPS/Electric drive design into action.

Two World War II merchant ships have already put in our memory an inspiring and courageous story of the spirit of these men. Their lessons are as true for today as they were for the Allied war effort - oil tankers. The first was the Shell tanker ONDINA which was engaged by two large Japanese merchant cruisers in the Indian Ocean in 1942, sinking one after a lucky shot hit its deck and then being shelled, tooled and kept for dead. The crew boarded the ship, managed to start the engines and slowly crawled back to Fremantle.

The other, and the subject of this book, was Texaco's OHIO also absorbed enormous punishment and simply refused to die. Built in 1940, at 14,500 deadweight tons and with a speed of 17 knots, it was the largest, modern and fastest tanker afloat at that time. OHIO's long journey was long enough for the ship to write its name into the annals of the war at sea, being the sole tanker in the large British 1942 fast convoy named OPERATION PEDRISTAL. Another..."the Germans and the Italians threw everything possible at the ship, managed to start the engines and slowly crawled back to Fremantle."

The OHIO was selected because Britain did not have a tanker capable of taking the keeping pace with the 16-knot convoy and it was a direct request from British Prime Minister Churchill to American President Roosevelt, which saw the ship loaned to a UK crew commander on board the ship.

Evidence of the vital importance of this 58-ship convoy was presented in the book. For example, the OHIO was the first ship to...manned those lumbering highly-radioactive warships in the English Channel and from the Arctic regions of Norway to the Franco-Spanish border. Many large guns pointed menacingly seaward from their fortifications including the three 400mm guns at Basters, Lindemans near Calais, the 340mm twin former French turret, Baterly Cepeli near Trudon, and a 380mm rail gun of Battery 698 captured at Margravine in Southern France. Two triple 280mm triple naval turrets, rotating turrets of Barlet Waldon, located east of Calais which originally housed 150mm guns. This is one of the many fortified defense lines including the Wehr Wall which was commenced in the 1930s and was one of the most modern of its time. There was the heavily built East Wall commencing in late 1943, along the so-called "fronts built decades earlier, in a bid to halt the Soviet Army."

Today, 60 years after the war, there are still thousands of examples of fortifications, including U-boat pens, fortresses, flak towers and casemates. Hitler's changeable attitude to defense and changes in focus were many times - spread throughout occupied territories never completed. Sally much of the wartime construction force was slave labour from occupied territories and prisoners-of-war living in appalling conditions.

An absolute treasure trove is the way to describe this 370-page book, which is supported by 88 technical drawings, 17 detailed maps, and over 140 photographs - many never previously published. Absolutely crammed with information, it includes maps of Adolf Hitler's HQ (Führer's Headquarters) at Berghof at Obersalzberg and in Tannenberg in the Black Forest near the Upper Rhine. Some of the other items personally found of particular interest are plans of the French Lorient and St Nazaire U-boat pens along with those of U-boat bases in Naples, and the Dora U-boat bunker at Trondheim, Norway.

This book is a most valuable addition to the history of World War II and a credit to the authors. One can only guess the countless hours of research involved in producing this magnificent reference book, which is laid-out in an easy-to-read format.

Most highly recommended.
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 capability to defend itself, paying particular attention to maritime defence. Australia is, of geographical necessity, a maritime nation whose prosperity 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 a defence capability which is knowledge-based with a prime consideration given to intelligence, surveillance and reconnaissance.
- Advocates the acquisition of the most modern armaments and sensors to ensure that the ADF maintains some technological advantages over forces in our general area.
- Believes there must be a significant deterrent element in the Australian Defence Force (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 littoral and jungle warfare as well as the defence of Northern Australia.
- 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.
- Endorses the transfer of responsibility for the co-ordination of Coastal Surveillance to 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.
- Advocates the development of a defence industry supported by strong research and design organisations capable of constructing all needed types of warships and support vessels and of providing systems and sensor integration with through-life support.

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 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 will lack air defence and have a reduced capability for support of ground forces.
- Advocates the very early acquisition of the new destroyers as foreshadowed in the Defence White Paper 2.
- Advocates the acquisition of long-range precision weapons to increase the present limited power projection, support and deterrent capability of the RAN.
- Advocates the acquisition of unmanned surveillance aircraft such as the GLOBAL HAWK primarily for offshore surveillance.
- Advocates the acquisition of sufficient Australian-built airlift support ships to support two naval task forces with such ships having design flexibility and commonality of build.
- 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 that in any future submarine construction program all forms of propulsion be examined with a view to selecting the most advantageous operationally.
- Advocates the acquisition of an additional 2 or 3 updated Collins class submarines.
- Supports the maintenance and continuing development of the mine-countermeasures force and a modern hydrographic/oceanographic capability.
- Supports the maintenance of an enlarged, flexible patrol boat fleet capable of operating in severe sea states.
- 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 current economic problems and budgetary constraints, believes that, given leadership by successive governments, Australia can defend itself in the longer term within acceptable financial, economic and manpower parameters.
Ships assigned to Combined Task Force One Five Zero (CTF-150), assemble in a formation for a photo exercise. The multinational Combined Task Force One Five Zero (CTF-150) was established to monitor, inspect, board, and stop suspect shipping to pursue the war on terrorism and includes operations currently taking place in the North Arabia Sea to support Operation Iraqi Freedom. From front to back, a USN Ticonderoga class cruiser, a French Georges Leygues class destroyer, a Pakistan Teg (formerly UK Type 21) class frigate, a Spanish FFG-07 class frigate, a French La Fayette class frigate, a USN Spruance class destroyer and a RNZN Anzac class frigate.

The Royal Navy Trafalgar class attack submarine HMS TIRELESS sits on the surface of the North Pole. TIRELESS surfaced with the U.S. Navy Los Angeles class attack submarine USS HAMPTON (SSN-767) for ICEX 04, a joint operational exercise beneath the polar ice cap. Both TIRELESS and HAMPTON crews mat on the ice, including scientists travelling aboard both submarines to collect data and perform experiments. The Ice Exercise demonstrates the US and British Submarine Force's ability to freely navigate in all international waters, including the Arctic. (USN)
Sporting an all over Navy grey livery the RAN survey ship HMAS LEEUWIN is seen leaving Hobart. (Brian Morrison, Warships & Marines Museum (INT), Franklin Tas)

One of the RAN's former inshore Minehunters SHAOLWATER. Both minehunters were recently sold to a Persian Gulf country. SHAOLWATER is seen here being readied to be lifted aboard a merchant ship for transport to the Gulf. (Brian Morrison, Warships & Marines Museum (INT), Franklin Tas)
The Last Gunfight
Pt 1

Regional Naval Developments

Australia's Leading Naval Magazine Since 1938
THE NAVY

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The Navy

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FROM THE CROWN'S NEST

LET EXPERTS DETERMINE EQUIPMENT NEEDS

For many years your Navy League has advocated the development of an amphibious capability in the Australian Defence force - a self-contained element embracing the three Services and able to act independently without resupplying from or relying on the resources of other services. It has now been agreed that the current Government's plans to provide the ADF with such a capability. Sadly, as soon as a key component of the amphibious force was approved - the ships required to transport and support the personnel and equipment involved - the project became mired in controversy. The fate of so many major defence projects and proposals seem to be decided, haphazardly, that Defence has made a mistake.

Australia's armed forces have taken part in numerous amphibious operations. In most cases in conjunction with other countries. Yet a capability is required to be shared, and using temporarily acquired equipment such as converted merchant ships that were returned to trade on conclusion of hostilities or when no longer required. For some time circumstances have required the Defence Force to have multi-purpose amphibious ships permanently available.

The RAN acquired a number of small landing craft ordered for the Army in the early nineteen-seventies and these together with the amphibious heavy lift ship TOBRUK, built to a British design by Carringtons in Newcastle and commissioned in 1981, gave the Navy a limited amphibious capability that has been used extensively and to good purpose ever since. The acquisition of the two LPA's, KANIMBLA and MANORINA, has only reinforced the notion that this flexible capability is replacement. However it is long overdue.

Australia's defence planners, informed and Public Service, are highly trained professionals and it would be foolish to underestimate, or misrepresent, their ability to determine the equipment required to enable soldiers, sailors and airmen to perform their tasks. For example: the decision on the amphibious ship's characteristics was arrived at through the hard learnt lessons of the amphibious phase of the East Timor campaign. As well as three years of Army experience, two years of Navy experimentation and one year of Joint experimentation. The new amphibious capability is not to be missed at a view with any other. Yet in the past Defence have sometimes failed. Financial considerations may well nullify a recommendation on the capability but ill considered criticism or political factors should not lead to second-best or inferior equipment decisions.

By Geoff Evans

FROM OUR READERS

NAVAL HERITAGE MUSEUM

Dear Editor,

I note your report in the last issue's Flash Traffic section regarding the formation of a Naval Heritage Museum in Sydney, at Garden Island. That site is well worth preserving and it is pleasing that the Navy has finally decided that its 100 years of Naval collections on Spectacle Island will at last be considered for formal display.

However, having said that, a prominent fact for all to see is that in the making of this decision we again see a major national maritime (naval) museum being centred in Sydney, for the benefit of that State. I would like to express my extreme disappointment at the Defence Minister's announcement. Supported by Chief of Navy, that Sydney is to receive this Naval Heritage Museum, taxpayer funded, on Garden Island, Sydney, at a cost of $5M. It is a matter of grave concern when chosen at this time, in the same breath, we also read that the resources of other countries and has thus endorsed the Australian heritage being centred in Sydney.

It is considered that the Australian Commonwealth Naval Heritage Collection on Spectacle Island should be located in Naval Heritage Museum Campuses in all State Capitals, where citizens in all States can have reasonable and ongoing access. It is observed that the Federal Government funded the National Maritime Museum in Sydney, at a cost exceeding $25M, with annual operating costs on top of that, to provide access to the nation. So there was no incentive to establish any State based NMM campuses. This new Naval Heritage Museum announcement seems to be an unequal extension of the same.

I believe that the present proposal for Sydney to keep onto itself all these Australian Navy Heritage Museum items, to the exclusion of all other States, requires immediate review. I consider that this decision should be immediately reviewed so that:

• Victoria, at least be allocated a matching $5M, for which it has made previous submission, and a fair share of the Naval Museum collection.
• It is also suggested that other States be given an opportunity to express their views on establishing a Naval Heritage Museum Campus in their own State.
• That Victoria be the headquarters for the proposed Naval Heritage Museum campus proposal, with authority to consult with all States determining the original distribution of the Naval Heritage Museum collection.

Thank you for the good work you do in producing THE NAVY.

Michael Head, 1s

RAN CORVETTES ASSOC (NSW)

ANNUAL CHURCH SERVICE

Dear Editor,

Our Association will hold its Annual Church Service at the Garden Island Chapel on Sunday, 24 October, 2004 at 10 am. Conducting the service will be Chaplain Dr. Garee Clayton (SAM, MA, RANR). The Royal Australian Navy Band and Colour Party will support the service (medals will be worn). A wreath laying at our Memorial on the Island will follow after morning tea. Approval has been given by the Captain, HMAS KUTTABUL for ex-Corvette men, their wives, families and friends to drive and park near the Chapel. After security gate clearance.

Den Webber
Hon Secretary
RAN Corvettes Assoc (NSW)
34 Aldan Avenue
Hurstville NSW 2220

ADMLIRAL GRAF SPEE

Dear Sirs,

I most enjoyed your article on the Battle of the River Plate (Vol 66 No 1 of THE NAVY) and the correspondence which followed.

Although we will never know what was in the minds of the German commander who led to the destruction of the ship - how much they actually knew of the British moves and how much they understood the British attempts to deceive them - as to the RN strength in the area - there is one influential piece of evidence - the Germans would have certainly known, their supply of ammunition.

GRAF SPEE mounted more or less battleship guns in a cruiser hull and carried a full load of 600 rounds of 11-inch ammunition. This was usually divided between 200 rounds of HE and 200 rounds of AP. It is my understanding that all the bottom fused and most of the HE had been expended and some of the AP had been fired as well by the end of the battle and the total available remaining 11-inch shells was about 176. Nearly all AP, the least suitable ammunition for a cruiser action.

This would suggest that GRAF SPEE had enough main armament ammunition for a full on naval battle lasting forty minutes. It is my suspicion that this fact may well have been highly persuasive in convincing the German commanders to take the action they did.

Thank you for the good work you do in producing THE NAVY.

Michael Head, 1s

Notice is hereby given that the ANNUAL GENERAL MEETING of THE NAVY LEAGUE OF AUSTRALIA will be held at the Brassey Hotel, Beimoor Gardens, Barton, ACT On Friday, 15 October 2004 at 8.00 pm

BUSINESS

1. To confirm the Minutes of the Annual General Meeting held in Canberra on Friday 17 October, 2003
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 2004
4. To elect Office Bearers for the 2004-2005 year as follows:
   - Federal President
   - Federal Vice-President
   - Additional Vice-President (3)
5. To confirm that 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 5 October 2004
   - To approve the constitution in office of those members of the Federal Council who have attained 72 years of age, namely John Bird (Vic), Joan Cooper (Tas), Tim Kilburn (Vic) and Andrew Robertson (NSW)
In Part 1 of our series on ASMD (Anti-Ship Missile Defence) Dr Roger Thornhill examined the use of guns as a last ditch defence against the modern ASM (Anti-Ship Missile). In Part 2 he examines the missile in ASMD.

To the lay observer the ASM has enjoyed 25 years of perceived superiority of the seas, but like all weapons, weapon systems and tactics time has produced counterers. The best hard kill counter to an ASM is ironically another missile. The modern ASM-missile is usually 'smaller' than its target and enjoys a level of accuracy, reliability and stand-off sufficient to counter all current ASMs.

Most early ASM-missiles were derivatives of other anti-air missile systems, e.g. the Seasparrow was derived from the air-launched AIM-7 AAM (Air-to-Air Missiles) and the Seawolf from the Rapier SAM (Surface-to-Air Missile). These were adequate to the task of basic point defence against aircraft and older missiles as their intended target was usually much smaller, flier higher and less manoeuvrable than the current family of ASMs. As the ASM became smaller so did the problem of detection and thus tracking and ultimate engagement. These older ASM-missiles may now find it harder to fulfill their intended role. However, today, the importance of ASM in producing its own specialist systems designed to counter the ASM head-on with anti-aircraft being a secondary capability.

The use of a missile for ASMD adds another layer to the defence of a ship, or ships. The ASM-missile is one of the longer layered in the hardkill category with small aircraft measures such as ECM (Electronic Countermeasures) i.e. jamming or long range chaff (thin metallic strips designed to induce mass and speed of the Soviet ASM to overwhelm the defender. Soviet ASM radar homing technology was poor and their missiles very large, both of these characteristics combined to present relatively easy targets. Consequently, mass and speed form of close range missile defence a cost-effective solution to more expensive and capable systems.

Of course the missile does have limitations and its employment must be to understand these as the ASMD-missile needs to be employed as part of a layered system.

A missile system usually consumes a high level of weight, space and power from the ship to operate to its full potential. It sometimes also carries key positions on the ship due to weapon requirements. On smaller ships this usually means offsetting another weapon system that could be employed in an offensive or support role for another entity.

The very technical nature of the missile system with its associated electronics for guidance, rocket motors etc can provide a myriad of potential points of failure, unlike the gun which has fewer moving parts. The highly technical nature also means cost.

Once the missile is fired it generally requires time to achieve a safe arm distance given its high explosive cargo. This could be anywhere from 300m to 500m and thus provides a gap in the layered approach that needs another system to fill. The gun can, in most cases, continue firing up until point blank range.

The lower time of flight of the gun projectile compared to a missile usually means there is time to fire more rounds than missiles.

In the ASMD mode some Navies adopt a 'better safe than sorry' philosophy and employ a 'shoot, shoot, shoot' policy where two to three missiles are fired at each target. While this will more likely produce a kill it essentially halves the ASMD-missiles available and needs to be kept in mind with a potential adversary's ASMD stocks and level of sophistication.

The last major limitation of an ASMD-missile system is the cost. Other weapon systems could be used in place of an ASMD-missile system that defends the employing platform, or close manoeuvring assets, only.

Despite these limitations, the ASMD-missile is becoming more popular as Navies realise that counterers to ASMs are effective and that adding another ASMD layer could mean the difference between effective and ineffective. Although a longer ranged anti-air system is a better solution, it gives the defender the potential to 'shoot the archer instead of the arrow', they are expensive and beyond the reach of many smaller Navies.

The following is snapshot of some of the more advanced ASMD-missile systems available today that are able to counter the modern ASM.

BARAK (Israel)

The existence of the Barak's Lightening's missile was first revealed at the Paris Air Show in June 1981. Barak is a relatively low-cost point defence missile system to protect ships against both aircraft and ASMs. It was originally conceived as a conventional lightweight weapon, similar to the British Sea Wolf, with two eight-round vertical launchers.

**The use of a missile in place of the gun for ASMD has a number of advantages such as long range, accuracy and effectiveness.**

Longer range engagements are the main benefit of a missile based ASMD. At greater range missile debris, from a successful intercept, has less chance of continuing on as a kinetic energy and inflicting enough damage on the intended target to to the ASMD-missile interception capability of alteration to compensate for ASM course corrections, particularly common over longer engagement ranges, or evasive manoeuvres performed by the target.

An ASM-missile can usually employ a larger warhead than a gun projectile as well as smarter fusing options for proximity engagements giving it a higher degree of efficiency.

The ASMD-missile also gives the ship a back-up anti-aircraft capability, assuming longer ranged systems are unavailable. Systems such as the French SADRAI, and US Sea RAM can be 'bolted to the deck' i.e. less intrusive into the ship's design and provide a higher level of protection against ASMs and aircraft for smaller ships than a gun. This protection means that an attacker must use more of his ASM inventory to overwhelm the ASMD to be confident in scoring a hit, not that necessarily equals a kill.

Few navies have such an inventory to overwhelm the combined ASMD of a fleet, making this cheaper form of close range missile defence a cost-effective solution to more expensive and capable systems.

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The Barak system consists of the missile, the launcher, and the fire-control system.

The fire-control system consists of an I/J and K-band (X-Ka band) monopulse coherent tracking and illumination radar which is supplemented, on the right-hand side, by a thermal imager. Search, acquisition and tracking may be conducted in either I/J (10 to 30 GHz) or K (20 to 40 GHz) bands and it can track a target or targets while controlling two missiles. The system may also be used for controlling guns, with the assistance of a separate ballistic computer.

Upon acquisition of the target(s)/threats by the ship's search radar, the fire-control radar designates the targets. The system automatically calculates the level of threat from each target, allocates a missile or missiles, and automatically launches them. In the ASM mode the Barak leaves the launcher and is turned over towards the target by a thrust vector control system. The missile is acquired and controlled by the fire-control radar which then guides it towards the target. The missile is capable of engaging targets 2km above the sea and can manoeuvre at 25g.

Development of the system completed in 1993 with Barak in service with the Navies of Israel, Chile and Singapore.

**MISTRAL (France)**

The Mistral man-portable surface-to-air missile system began development in 1977 for a French Army requirement for a man-portable low-level air defence system. However, during the late 1980s, consideration was given to a naval version. In 1986 the Naval Mistral system underwent a number of successful trials before being marketed as the SADRAL.

A successful intercept of a sea-skimming ASM by a French Mistral 2 ASM.

The SADRAL launcher used by the missile is a remotely operated system on a two-axis stabilised mount and is designed to provide self-protection for fast attack craft and ASM point defence for larger warships, when integrated with a radar and/or electro-optic search systems. SADRAL has six launcher-containers and a closed-circuit television camera which is complemented by a thermal imaging camera for night or bad weather operations.

The missile is ejected from the launcher-container by the booster and, once clear, the control and tail surfaces are deployed. The sustainer ignites some 15m away from the launcher-container and burns for 2.5 seconds as the missile homes in on the target. When very close to the target, the missile makes a final correction in order either to hit or to be within lethal range before the warhead detonates. The maximum time of flight is 13 seconds.

Production of Mistral 1 has been completed with over 15,000 rounds ordered by 23 countries of which at least 1,500 are for naval use by 12 countries. Production of Mistral 2 has begun with some 120 Mistral naval systems being ordered. It is understood from industry insiders that Mistral 2 and the SADRAL system may be acquired by the Royal Navy's Anzac frigates' VLSR (Very Short Range Air Defence) system which will be equipped with four M-31 RAM launchers for its ASMCD screen.

A new development by Raytheon is the Sea RAM. The Sea RAM is essentially the Phalanx Block IB but with the gun replaced by an 11-cell launcher. It is intended to extend ship self-protection to ranges of 2km (4km) while reducing the fire control and deck intrusion requirements for a full RAM system.

Some 230 systems have been acquired, or ordered.
Automatically launched, although frequently a second will the target to establish a radar line of sight. When the target is within range one missile is launched, although frequently a second will follow it moments later. After launch the missile is acquired by the wide angle antenna and gathered into the target line-of-sight. Its position relative to the centre of the tracking beam is monitored by the radar, and the shipborne guidance computer generates the necessary steering commands to keep the missile in the centre of the beam until it intercepts the target. The missile’s rearward facing antennas help to provide a good ECCM (Electronic Counter Counter Measures) capability. A television camera is used for low-level tracking with flares on the Seawolf showing the missile’s location. The standard test target consists of a 14kg fragmentation high explosive warhead with an impact-proximity fuse.

The baseline ESSM will be purely radar guided although an additional IR seeker is envisaged for later versions to increase accuracy in severe radar jamming environments.

Production is expected to exceed 3000 missiles with the potential market being for 140 US and 115 foreign warships.

**VL SEAWolf (UK)**

Since the Falklands War where Seawolf proved itself, the missile has undergone a number of improvements. The missile is now employed in the Vertical Launch (VL) mode in order to achieve faster reaction times and greater range. The Seawolf system consists of an air-search radar, two trackers, a missile and a command sub-system. VL Seawolf is almost identical internally to earlier models but differs externally with a cylindrical booster with square fins attached to the rear. At the rear of the booster is a thrust vector control unit with four blade-spoilers for rapid and reliable control of exhaust gases during the turnover manoeuvre. Internally the missile consists of a 14kg fragmentation high explosive warhead with an impact-proximity fuse. Behind it is the guidance compartment.

The Seawolf system is completely automatic, although a manual override facility exists, it is able to analyse sensor data to establish a track, conduct threat analysis then allocate target priorities. There the threat is evaluated and the target is assigned to a tracker which slew towards the target, the tracker searches in elevation until it acquires and locks on to the target to establish a radar line of sight.

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One of the first photos of the South Korean designed and built stealthy KDX II class DDG YUL SUNGAH, during the recent RIMPAC 2004 exercise near the Hawaiian island. The KDX II has formidable weapons arrays with firing from the bow a Mk 45 Mod 4 127mm gun, a Mk 41 VLS for Standard SM-2 missiles, a Mk 31 RAM launcher above the bridge, eight Harpoon ASM, a 30mm Goalkeeper CIWS and two medium sized helicopters (USN).

Much is happening on the Asia Pacific naval scene. Naval activity levels are high and naval budgets continue to grow with many regional Navies moving into more advanced capabilities and larger warships than they operated previously. While these developments are largely in response to a feeling of increased maritime insecurity, the developments themselves also have potential to add to insecurity in the region.

There are some worrying longer-term implications of the force structure developments discussed in this review. While these developments are largely in response to a feeling of increased maritime insecurity, the developments themselves also have potential to add to insecurity in the region.

**Northeast Asia**

Northeast Asia remains an unstable part of the region. This is not just a matter of Taiwan and the rogue behaviour of North Korea but reflects lingering bilateral tensions between various pairs of regional countries: Japan and Russia, South Korea and Japan, China and Japan. There are longer-term strategic implications of strengthened military cooperation between China and Russia that includes sales of high technology naval weapon systems, while Japan remains concerned about the strategic ambitions of China. The unresolved disputes over sovereignty of the Kuril Islands, Takeshima/Tokado and the Senkaku Islands do not help bilateral relations in the region.

With this ongoing instability, it is not surprising that all Northeast Asian Navies are pursuing ambitious force development and operational plans. Japan has been particularly active in using sea power to extend regional influence. Deployments by the Japanese Maritime Self Defense Force (JMSDF) to support coalition operations in the Indian Ocean and by the Japanese Coast Guard (JCG) in Southeast Asia to assist in deals with piracy and terrorism are now commonplace. The wider sea power aspirations of Japan are evident in force structure terms, with ideas about establishing a sea-based ballistic missile defence capability and in ordering two large “helicopter escort destroyers”. These ships will have a fully loaded displacement of nearly 20,000 tonnes and could be equipped with STOVL combat aircraft. They have the potential to fuel fears in the region about Japanese rearmament. Japan’s modern and very capable Oyashio class submarines are now operational. The Republic of Korea Navy (ROKN) also has ambitious force development plans including the acquisition of two large...
The Russian Pacific Fleet has increased the frequency of its recent out-of-area deployments and ambitious exercise activities. For example, declining from 54 units in 1995 to about 17 at present. However, in pursuance of new naval doctrine based on realistic budget expectations, the Pacific Fleet is seeking to regain some of its former influence and has embarked on new budgetary projects, including Harpoon missiles, the Aster Anti-Missile Missile (RAM) system and an advanced AWG 9 radar. Along with the submarines, these vessels demonstrate the preparedness of the RSN to operate well beyond the immediate confines of the Singapore Strait and its approaches.

Since the collapse of the Soviet Union, the Russian Pacific Fleet has been as much affected by depressed budgets as other elements of the Russian military. It has been through a period of sharp decline in its order of battle with its submarine fleet, for example, declining from 54 units in 1995 to about 17 at present. However, in pursuance of new naval doctrine based on realistic budget expectations, the Pacific Fleet is seeking to regain some of its former influence and has embarked on new out-of-area deployments and ambitious exercise activities.

International naval analysts remain sceptical about whether it will be possible to transform the Russian Pacific Fleet back into a significant strategic force. The problems of under-funding and morale may be simply too large. Nevertheless, the 'trump cards' still available to Russia are its nuclear weapons capability and high-tech weapon systems. The Russian Pacific Fleet has increased the frequency of its nuclear exercises in recent years and this has led to speculation that nuclear weapons are still considered the main means of curbing the U.S. in any possible conflict in East Asia.

Southeast Asia
Southeast Asian countries recognise the potential for maritime threats and the strategic implications of their location vis-a-vis major shipping chokepoints. They seek to develop maritime forces (ships, aircraft, and submarines) with a potentially powerful capability for sea control in the region.
Sea Shield provides layered defence to protect the homeland, sustain access to littoral areas, and protect coalition and joint forces in even distant parts of the globe. Key elements include advanced sea-based ballistic missile defence provided by new (AEGIS) class ships, littoral control capabilities, new mine countermeasure capabilities and enhanced ASW particularly against modern, quiet diesel submarines. Littoral sea control is a major mission under Sea Shield. The Littoral Combat Ship (LCS), in which Australian ship designers have taken an interest, will provide much of the required capability. It will be designed modularly so that it can be reconfigured fairly quickly to perform one of three missions: ASW against quiet diesel submarines; operating in crowded, noisy and shallow coastal waters; mine countermeasures; and countering swarm attacks by small, high-speed boats armed with missiles.

Sea Basing exploits inherent advantages of sea-based forces to operate and provide capability on foreign bases. Expeditionary operations and amphibious warfare capabilities are fundamental elements. A new class of amphibious assault ship, the LHA(R), will be designed to operate the STOVL variant of the F-35 Joint Strike Fighter and tilt rotor V-22 aircraft, and to provide forward basing for special forces. Along with the LHA(R), the U.S. Navy is also developing new concepts for maritime pre-positioning, high-speed lift, and amphibious capabilities.

The U.S. Navy’s Global Concept of Operations is a major manifestation of globalisation and maritime power. It puts a clear emphasis on providing naval striking power around the globe. It is based on new packages of naval forces that improve the ability to generate combat power simultaneously in different parts of the world. Reorganised carrier strike groups will have fewer surface combatants and attack submarines than a carrier battle group and expeditionary strike groups will include a strike capability provided by surface combatants and a submarine, as well as amphibious ships. The number of ships assigned to the Pacific Fleet will be increased and the Atlantic Fleet downsized.

The overseas military deployment policies of the U.S. are currently under review to ensure they meet new requirements of mobility and flexibility. This might mean possible reductions in forces based in East Asia in favour of smaller, more agile forces deployed from continental U.S. or from an increased number of smaller bases overseas. These forward operating bases will be located in the vicinity of possibly ‘hot spots’. They are being built or expanded in countries such as Qatar, Bulgaria and Kyrgyzstan, and in the American territory of Guam. There is a major need for bases on or just off the East Asian littoral – in the Philippines, Singapore and elsewhere in Southeast Asia. These are not to be base forces under a permanent arrangement but to ensure that access is available when required. An American base of this nature may be established in Darwin in northern Australia.

Oceania

The Royal Australian Navy has emerged from several years of high operational tempo in good order and with a major force development program approved. This includes the projected acquisition of three air warfare destroyers (AWD), two large multi-purpose amphibious landing ships with a new class of sea-lift ship to follow in the longer term, and the second-hand purchase of a ship to replace the aged tanker HMAS Perth. These developments are indicative of a new interventionalist attitude.

Expeditionary forces and naval power projection capabilities, including large amphibious ships, land attack cruise missiles and versatile surface combatants to exercise control in littoral areas, are not just the monopoly of the U.S. Among the Commonwealth countries, Australia is a major contributor to the major command in the region.

Conclusion

The international system is going through a period of dramatic change. It has been time to observe that the world changed forever on September 11, 2001. However, the changes are not only in response to the threat of terrorism but also include other consequences of globalisation and interdependence. These changes underpin naval developments in the region, including a more evident concern for the security of shipping and seaborne trade and the actions initiated mainly by the U.S. to deal with maritime terrorism and the threat of weapons of mass destruction. The moves by China, Japan, India and Russia to use their Navies and coast guards to extend their regional influence and the no longer remote possibility that European Navies could become involved in the region might also be seen as consequences of increased globalisation and interdependence.

Globalisation is much more than just an economic phenomenon. It also has significant security implications. Regional naval developments can no longer be assessed purely in the context of the region itself. This is no just a matter of terrorism being a global threat but also flows from the nature of world trade and the international arms industry with Europe and North American companies competing aggressively for the Asian naval market. Ther is the contrast between on the one hand, the focus of Western Navies on littoral operations and expeditionary forces and on the other, regional Navies developing more powerful seafaral capabilities to defend their littoral. While current naval developments proceed, the possibility that these strategic cultures could clash at some time in the future is not entirely fanciful.

The Author

Dr Sam Baieman retired from the RAN as a Commodore in 1991 and became the first Director of the Centre for Maritime Policy at the University of Wollongong where he is now a Professorial Research Fellow. His naval service included four ship commands, five years in Papua New Guinea and several postings in the force development and strategic policy areas of the Department of Defence. His current research interests include regional maritime security, strategic and political implications of the Law of the Sea, and maritime cooperation and confidence building. He is Co-Chair of the Council for Security Cooperation in the Asia Pacific (CSCAP) Working Group on Maritime Cooperation and a member of the International Sea Lines of Communication (SLOC) Study Group.
Govt playing safe on new Amphibs

French shipbuilding group Armaris and Spanish shipbuilding group IZAR have both been asked to participate in a financed risk reduction and design study for the RAN's two new LHD amphibious support vessels.

The Defence Minister, Senator Hill, said the study was a further step towards the selection of a new amphibious ship design to replace HMAS TOBRUK and the LPAs KANIMBLA and MANOORA.

The $3 billion project will equip the Australian Defence Force with two new amphibious ships capable of performing a range of tasks, including non-military tasks such as participating in disaster relief, delivering humanitarian aid, support for peace operations, and assistance to policing or military operations. A large sealift ship will also be purchased, bringing the number of hulks that can transport Australian Army elements overseas to three.

Defence has conducted a preliminary design assessment in consultation with the Australian shipbuilding industry which confirmed the basic designs of Armaris and IZAR broadly meet the ADF's capability requirements for the new amphibious ships, Senator Hill said.

The study will assist Defence to further assess the suitability of the companies' amphibious ship designs for the ADF's capability requirements, including the capability, cost, schedule, technical risk and industry issues relating to the construction of amphibious ships.

As part of the study, Armaris will be asked to provide detailed information relating to three variants of its Mistral design; the military off-the-shelf design which is currently in production; a modified design providing for increased troop capacity; and an option based on the original extended Mistral design.

IZAR will be asked to provide detailed information relating to its Strategic Projection Ship design.

The decision to conduct the risk reduction and design study was based on the Government's implementation of the Kinnaird Review's recommendaion that increased planning and analysis be undertaken during the early stages of Defence projects.

Senator Hill said Defence was expected to receive the information in December 2003.

It is anticipated that the outcomes of the study will inform the selection of a preferred design for the amphibious ships in the first half of next year.

It is hoped that the study will silence the many sensationalist and uninformmed members of the media and self-proclaimed academics who have misrepresented and questioned the new capability requirement. Although facts have never stopped a 'good story'.

AEGIS for RAN's new destroyers

The Howard Government has selected the US Aegis air warfare system as the core of the combat system for Australia's new air warfare destroyers.

Aegis is currently in use with the Japanese and Spanish navies and soon to be introduced into the South Korean and Norwegian fleets. Aegis is capable of detecting and defeating numerous hostile surface and airborne targets simultaneously at ranges in excess of 250 kilometres.

"This combat system will be a quantum leap in the air warfare capabilities of the Royal Australian Navy. It will provide significantly improved protection from air attack, for example, it will be capable of defeating long-range air warfare defence for a Navy task group and a coordinated air picture for the more effective deployment of fighter and surveillance aircraft", said Minister for Defence Senator Hill.

The first of Australia's three new air warfare destroyers is expected to be delivered to the Royal Australian Navy's auxiliary oiler, HMAS WESTRALIA (see THE NAVY Vol 66 No 3). The purpose of the conversion will be to modify the vessel so that it has the latest technology and equipment augmentation of the Aegis Combat System Technology Organization and support from the USN.

Defence is currently undertaking a competition for integration and risk reduction study to:

- Refine detailed aspects of the version of the Aegis system to be acquired;
- Explore the use of Australian-designed phased array fire control technology that has significant potential to enhance the air warfare destroyer's capabilities;
- Examine options for integrating Australian components and subsystems into the Aegis combat system.

SM-2 for FFGs

Four of the RAN's Adelaide Class Guided Missile Frigates will be capable of firing the US SM-2 air-antimissile after the Government approved a $550 million upgrade of their area air defence missile systems.

The upgrade of HMA Ships SYDNEY, DARWIN, MELBOURNE and NEWCASTLE by early 2009 would significantly improve the air warfare capabilities of the Royal Australian Navy.

The reason behind the purchase involves the shelf-life of the current principle anti-air weapon of the FFGs, the SM-1, its increasing maintenance costs, limited availability production and its inability to defeat modern ASM (Anti-Ship Missiles). The project cost will cover acquisition of live and training SM-2 rounds, integration into the FFGs' support packages.

SM-2 will more likely be used in the new air warfare destroyers and thus unused rounds from the FFGs can be altered for later use.

Tender issued for conversation of tanker

Defence has announced plans to release a request for tender (RfT) for an extensive upgrade to the recently acquired commercial tanker which will replace the Royal Australian Navy's ageing auxiliary oiler, HMAS WESTRALIA (see THE NAVY Vol 66 No 6).

The purpose of the conversion will be to modify the vessel so that it has the latest technology and equipment augmentation of the Aegis Combat System Technology Organization and support from the USN.

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The tender, which was purchased by Defence in June, has been leased for six months to Teckay Shipping under a standard charter contract arrangement. The lease allows Defence to generate income from the ship in the period until the modification work commences, avoiding the significant costs associated with mooring the vessel, and allowing the testing of the vessel's engineering systems at an early stage.

DELOS is 225 metres long and weighs 37,000 tonnes.

Some of the specific modifications sought include:

- The installation of a replenishment at sea rig and flight deck for daylight operations;
- Various habitation, accommodation and modification; including hotel services (heating, ventilation, air-conditioning, freshwater, sewerage) for Navy personnel;
- A number of navalisation packages (including the introduction of the Rigid Hulled Inflatable Boats and a related crane, and Navy life saving and damage control modifications).

The modifications to the ship are expected to cost between $50 and $70 million and will be undertaken in Australia creating new jobs and consolidating the high-tech and specialized skills of Australia's naval shipbuilding and repair sector.

In order to meet RAN operational requirements in the 2006-07 period, Defence intends to let a single request for tender (RfT) for the design, initial logistic support, and modification of the ship. The successful tenderer for the prime contract will be sought from the members of the existing Navy Repair and Refit Panel, being ADS, Forges, United Kilpatrick Green and Tenneco. It is expected that some of these companies may team with design and logistic support experts in responding to the tender.

It is expected that tendering a single contract for the design, initial logistic support, and modification of the ship will result in the vessel replacing WESTRALIA six months earlier than anticipated and also generate administrative savings.

New radar detectors for Armidale

A $25 million Australian-designed radar identification system will be installed in Australia's new Armidale class patrol boats - dramatically boosting the Navy's capacity to track down illegal vessels.

The Delos, which was purchased by Defence in June, has been leased for six months to Teckay Shipping under a standard charter contract arrangement. The lease allows Defence to generate income from the ship in the period until the modification work commences, avoiding the significant costs associated with mooring the vessel, and allowing the testing of the vessel's engineering systems at an early stage.

DELOS is 225 metres long and weighs 37,000 tonnes.

Some of the specific modifications sought include:

- The installation of a replenishment at sea rig and flight deck for daylight operations;
- Various habitation, accommodation and modification; including hotel services (heating, ventilation, air-conditioning, freshwater, sewerage) for Navy personnel;
- A number of navalisation packages (including the introduction of the Rigid Hulled Inflatable Boats and a related crane, and Navy life saving and damage control modifications).

The modifications to the ship are expected to cost between $50 and $70 million and will be undertaken in Australia creating new jobs and consolidating the high-tech and specialized skills of Australia's naval shipbuilding and repair sector.

In order to meet RAN operational requirements in the 2006-07 period, Defence intends to let a single request for tender (RfT) for the design, initial logistic support, and modification of the ship. The successful tenderer for the prime contract will be sought from the members of the existing Navy Repair and Refit Panel, being ADS, Forges, United Kilpatrick Green and Tenneco. It is expected that some of these companies may team with design and logistic support experts in responding to the tender.

It is expected that tendering a single contract for the design, initial logistic support, and modification of the ship will result in the vessel replacing WESTRALIA six months earlier than anticipated and also generate administrative savings.

AEGIS for RAN's new destroyers

The Howard Government has selected the US Aegis air warfare system as the core of the combat system for Australia's new air warfare destroyers.

Aegis is currently in use with the Japanese and Spanish navies and soon to be introduced into the South Korean and Norwegian fleets. Aegis is capable of detecting and defeating numerous hostile surface and airborne targets simultaneously at ranges in excess of 250 kilometres.

"This combat system will be a quantum leap in the air warfare capabilities of the Royal Australian Navy. It will provide significantly improved protection from air attack, for example, it will be capable of defeating long-range air warfare defence for a Navy task group and a coordinated air picture for the more effective deployment of fighter and surveillance aircraft", said Minister for Defence Senator Hill.

The first of Australia's three new air warfare destroyers is expected to be delivered to the Royal Australian Navy's auxiliary oiler, HMAS WESTRALIA (see THE NAVY Vol 66 No 3).
one other nations. Royal Australian Navy, Army and Air Force units were fully integrated into the exercise scenarios, focusing on enhancing interoperability. RIMPAC Rim region. This year's exercise helps promote stability in the Pacific region. Commodore said: "It is sad ... but she has served well. She will be a 'dive magnet' for the region and create up to 200 jobs."

**Steel Cat sinks to sunny Qld**

The sinking of the former HMAS BRISBANE, The Steel Cut, off the Queensland coast next year will create a "diving magnet" for Australia, bringing 25,000 extra tourists to the region and providing up to 200 new jobs, Queensland Premier Peter Beattie said at the formal hand over of the ship in Sydney.

Premier Beattie, the Federal Member for Fisher, Peter Slipper, who pushed hard for BRISBANE to go to Queensland, and the State Member for the seat of Kawana, Chris Cunningham, were on hand at Fleet Base East on July 13 to accept the destroyer from the Defence Minister, Senator Robert Hill.

A computer generated image of the new Boeing 737 MMA which 108 aircraft to be purchased by the US Navy to replace its ageing fleet of 221 P-3 Orion aircraft.

"The 737 MMA will play a critical role in the future of maritime warfare by providing the U.S. with dominance in anti-surface and anti-submarine warfare as well as reconnaissance and surveillance missions," said Mr. Albaugh, president and Chief Executive Officer of Boeing Integrated Defense Systems.

The CFM56-7 engines that will power the Boeing 737 MMA are produced by CFM International, a 50/50 joint company of Snecma Moteurs and General Electric Company. The company that powers the RAAF’s Boeing 737 Airborne Early Warning & Control aircraft, as well as the U.S. Navy’s C-17 transport aircraft. The two CFM56-7B27A engines will each provide 27,300 pounds of thrust and support MMA’s demanding electrical output requirements to support the flight deck and mission system operations. The CFM56-7 is one of the world’s most reliable engines. More than 30,000 units have been delivered to date. This fleet of engines has logged more than 30 million flight hours while maintaining an industry-leading 0.02 flight shut down rate per 1,000 flight hours. This rate translates to one event every 500,000 flight hours.

Northrop Grumman’s Baltimore-based Electronic Systems sector will provide the electro-optical/infrared (EO/IR) sensor, the directional infrared countermeasures and the electronic support measure system. Northrop Grumman's Mission Systems sector, based in Reston, Va., will develop data links for MMA. The company's Integrated Systems sector, based in Baltimore, will support the mission planning effort. Raytheon will provide an upgraded APS-137 Maritime Surveillance Radar and Signals Intelligence (SIGINT) solutions. Raytheon is also offering its revolutionary GPS Anti-Jam, Integrated Friend or Foe and Towed Decoy Self-Protection Suites, and the Navy’s Broadcast Information System (BIS) and secure UHF SATCOM capability. Smalls Aerospace supplies both the Flight Management and Stores Management systems on the Boeing 737 MMA. The Flight Management System provides a comprehensive system for the electronic control of integrated weapons management. This system is designed with standards to accommodate current and future precision weapons.

**RANKIN proves formidable**

The US Navy has described HMAS RANKIN as a "formidable opponent" after her performance in the last major training exercise before the start of RIMPAC.

RANKIN (LCDR Steve Hussey) was the centrepiece of Exercise Silent Fury as a "hostile" submarine, pitted against a highly capable US Navy ASW task group.

The US guided missile destroyers USS O’KANE and USS PAUL HAMILTON, guided missile frigate USS REUBEN JAMES, nuclear submarine USS KEY WEST, six P-3C Orions and Helicopter Anti-Submarine Squadron LANT-30 provided themselves against the "Australian Black Knight."
“Silent Fury was an excellent opportunity for us to challenge our air crews in our primary mission area of undersea warfare,” said CMDR David Smith, Commanding Officer of the US Patrol Squadron 4.

“RANKIN was a formidable opponent and provided unique training opportunities for the entire task force and us,” he said.

The USP 4's role in the operation was to provide a presence in the region, support U.S. forces ashore and at sea, and contribute to the overall stability of the area.

**USS TICONDEROGA decommissions**

The USS Nimitz-class aircraft carrier USS TICONDEROGA (CG-47) was decommissioned on Sept. 30, 2004.

More than twenty years old, TICONDEROGA was built in Pascagoula, Mississippi, in January 1983, and was the first ship of the AEGIS guided-missile cruiser class. It was the world's first surface combatant equipped with the AEGIS combat system, the most sophisticated air defence in the world.

During its first 11 years of service, the ship has been involved in major national and international events, and several historic NATO exercises. TICONDEROGA's adventures have taken her to duty in the Gulf of Suez and the Gulf of Aden, to the Arctic Circle, the Equator, and through the Suez and Panama canals. The ship was one of the first to report on an oil spill in the Gulf of Mexico, some 60 miles off the coast of Brownsville, Texas, in March 1990. She has deployed to the Mediterranean Sea, the Caribbean Sea and the Eastern Pacific Ocean.

**Maritime Chinook on drawing board**

It was announced at this year's Farnborough air show that the UK MoD is preparing to develop a version of the heavy lift helicopter optimised for shipboard operation, including automatic folding rotor blades, extra marination of engine components, radio navigation equipment and other enhancements.

One enhancement on the drawing board involves shortening of the blades so they do not bend too much when tilted in high seas, thus making it difficult to start up when the up and down motion of the ship could produce stress on the blades and prevent start up due to proximity to the helicopter's fuselage.

The UK Royal Air Force currently has 38 CH-47s in service.

**First F-310 frigate for Norway**

The MSN 362 153 fleet frigate, F-310, is described as a multi-purpose vessel, capable of performing a wide range of tasks, from anti-submarine warfare to anti-aircraft operations. It is equipped with advanced sensors and weapon systems, including a Phalanx CIWS, a Sea Giraffe radar, and a SeaRAM missile system.

**SA Navy on track**

Progress in developing South Africa's naval forces took a leap forward recently with the first of three submarines launched in September. The first submarine, the Protea-class submarine S102, was launched in Durban. The second submarine, the S103, is scheduled to be launched in 2005. The third submarine, the S104, is planned for launch in 2006.

The submarines, together with Grpen fighter aircraft and Hawk trainer jets on order, are the fruits of South Africa's controversial multi-billion Rand arms deal. Submarine S101 was launched at a ceremony attended by the Prime Minister of the German Submarine Consortium, KDW, in Kiel, Germany.

**USG destroyers keeping tabs on Pyongyang**

Defence contractor Lockheed Martin is modifying six USN destroyers for use in the Sea of Japan to provide early warning of North Korean missile strikes.

The modifications will include two radar systems and two computer processor systems on the Aegis-class destroyers in the western Pacific, including the U.S. Vladivostok. The destroyers will also be fitted with a new suite of electronics and weapons systems.

**Singapore, Malaysia, Indonesia start Pirate patrols**

Singapore, Malaysia and Indonesia have begun coordinated patrols of the Strait of Malacca shipping lane to deter terrorism and piracy in East Asia's maritime lifeline.

Admiral Mohd Nor, Malaysia's Chief of Navy, said: "If there is an incident where a 'hot' pursuit occurs, we will establish a Green Zone communication and will conduct a handing-over kind of operation, rather than pursuing the contact."
Fincantieri launches CONTE DE CAVOUR

The new Italian aircraft carrier, CONTE DE CAVOUR, which was ordered by the Italian Navy in November 2000, was recently launched at shipbuilder Fincantieri’s Genoa yard. The ship has a displacement at full load of 27,100 tonnes; an overall length of 244 metres; a maximum beam of 39 metres; a draught of 28 knots; and a sustained speed of 28 knots; will have a range of 7,000 nautical miles at 16 knots, equivalent to approximately 18 days sailing, which will enable her to carry out long range operations.

The four General Electric-Avio turbines of the CONTE DE CAVOUR will provide the vessel with a maximum speed of 39 knots and a sustained speed of 28 knots. The vessel will also be able to embark the full range of aircraft types used by the Italian Navy: helicopters (EH-101, NH-90 and SH-3D) and fixed wing aircraft (HL-115 AV-8B Harrier II and, in the future, F-35 Joint Strike Fighter).

In building the vessel Fincaentieri drew greatly on its experience in merchant shipbuilding where the company is a world leader in the field of cruise ships and large ferries. Transfer of dual knowledge and expertise gained both in the naval and in the merchant field leads to important synergies and is considered one of the company’s pillars of strength.

Indonesia commissions patrol boats

The Indonesian Navy has received three new patrol boats produced by its maintenance facility unit at a ceremony aboard one of them in the waters off Jakarta on August 6.

The three patrol boats – KRI BOA 307, KRI WELANG 808 and KRI TALIWANGSA 870 – measure 36 metres and weigh 90 tons each with a maximum speed of 28 knots, each priced at 12 billion rupiah (US$1.3 million).

On the occasion, Indonesian Navy Chief of Staff Admiral Bernard Kentia Sukandah said he expected 12 patrol boats of similar type to be in service by the end of this year. He also said the first 40-metre patrol boat project by the Navy was expected to be completed this year and be fitted with guided missiles, which will also be produced by local industries.

He said he would invite institutions concerned to jointly produce Indonesia’s first indigenously made guided missiles. They include the Indonesian Institute of Sciences, state arm industry Pindad and state-run aerospace industry PT Dirgantara Indonesia.

SM-6 inbound

The US Office of the Secretary for Defense has given approval for the USN to begin the system development and demonstration phase of the navy’s new SM-6 anti-aircraft missile system.

The SM-6 is an extended range active anti-air missile intended for the horizon autonomous engagements of aircraft and missiles. Preliminary estimates put the fire and forget missile’s range against air threats at 200 miles.

The missile will look essentially the same as the SM-3 missile with its large booster rocket and have mid-course update guidance and the seeker head of the AM-120 AMRAAM (Advanced Medium Range Air-Air Missile).

The missile will be vertically launched and adopt a high altitude ballistic trajectory to the target area. Once at its apogee the SM-6 will dive down onto its target using its own onboard target search and designation system for target acquisition and course corrections. Future Block upgrades to the SM-6 may include an IR backup to aid against stealth aircraft or in high electronic jamming environments.

The USN will now produce 120 low-rate initial production missiles before a review is carried out to ascertain if the missile and technology is ready for full-rate production.

Observations

By Geoffrey Evans

SHIPPING AND PORT VULNERABILITY

The shipping world received unexpected media attention mid-year as the government announced various measures to counter possible terrorist attacks on the water/land interface.

International shipping authorities in fact recognised the potential risks to ships and ports following the attacks in New York and Washington in September 2001. The International Maritime Organisation (IMO) proposed a number of maritime security measures that were adopted at a Conference in December. Due to be in force by 1 July 2004, a high rate of compliance by countries has been reported, including Australia, but there is a long way to go and it will be very costly if all proposed measures are to be implemented.

The shipping and cargo handling industry is huge. In a highly detailed paper on maritime related terrorism released at the beginning of the year, Michael Richardson, Visiting Senior Research Fellow at the Institute of Southeast Studies in Singapore, notes that at least 46,000 ships ply the oceans calling at over 2,800 ports: in 2002 these ships moved some 5.9 billion tonnes of materials of which general cargo (i.e. non-bulk) was mostly in containers of which there are an estimated 13 million in circulation. 1.2 million seafarers are employed while hundreds of thousands work in the ports.

Australian shipping figures are equally impressive. In 2002-2003, 939.9 million tons of materials were moved into and out of the country. 3.8 ship arrivals from overseas were recorded. 3.9 million containers were exchanged in the five mainland capital ports. 2.75 million in Melbourne and Sydney alone (and of which, realistically, only a fraction could be checked). With only 1000 seafarers on Australian-flagged ships, most of the cargo were transported in owned vessels, including those on so-called ‘FLAG of convenience’ registries that may well spend some time in Australian waters.

The IMO sponsored security measures require universal adoption of precautions already taken by most responsible shipowners and shipmasters, e.g., restricted access to ships, passport checks, etc. Future Block upgrades to the SM-6 may include an IR backup to aid against stealth aircraft or in high electronic jamming environments.

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DEFENCE AND THE ELECTIONS

It is probably inevitable, but in the lead-up to Federal elections, Government announcements, press releases and Opposition spokespeople forecast dramatic changes in the Departments over which they hope to preside.

Scepticism usually greets the Ministerial pronouncements - why don’t you do this while in Office? - and it does seem sensible for Opposition Ministers to wait until they were in office before making rash promises to make changes that will only prove unnecessary or impracticable; especially in Defence, one of the most complex organisations in the country.

In fact, over the years changes brought about by elections have made little difference to Australia’s defence arrangements; rather the Organisation has evolved as a result of events in the wider world, a pattern of development for which Australians should be grateful.

COASTWATCH

Bear in mind the numerous reviews and changes in Australia’s coastal surveillance arrangements between the late nineteen-sixties and the end of the century, after 4 or 5 years of relative stability under Customs Service administration. Coastwatch seems destined for a further period of change in the event of a change of government.

The name would almost certainly change from Coastwatch to Coastguard or Coast Guard (as in America) but it is not clear if the Organisation would become the responsibility of a new department or be transferred to the Federal Police, which became the co-ordinating authority in 1984, taking over from the Department of Transport. New equipments including patrol boats able to operate helicopters have also been proposed; the latter would not be cheap but would at least relieve the Navy of the need to provide even-more-expensive frigates for some tasks.

An important change was made to surveillance arrangements in 1999 when a senior naval officer(*) was seconded to the Customs Service as Director General of Coastwatch and co-ordinator of the several government departments and agencies involved. In a relatively short time the Director General with a tiny staff and the administrative support of Customs brought the various elements together and with more effectively used resources formed an Organisation that has served Australia well over the past several years.

Change for the sake of change is to be avoided.

(*) Rear Admiral B E Shailor, since promoted and currently serving as Vice Chief of the Defence Force.
In a decision applauded by many observers, the ADF has finally chosen its additional amphibious troop lift helicopter.

The ADF has been an enthusiastic operator of Sikorsky's UH-60L Black Hawk, and upgrading the Australian Army's existing 35 S-70A-9 Black Hawks to the M standard.

Sikorsky proposed a mix of 13 new UH-70M Black Hawks and upgrading the Australian Army's existing 35 S-70A-9 Black Hawks to the M standard.

In Sikorsky's favour was the long operational experience that the ADF has with UH-60S-70 derivatives and the worldwide operator base including the US Army Black Hawk and US Navy Sea King helicopters.

Sikorsky also pitched the H-92 as the natural successor to the Black Hawk, incorporating the experience of almost 30 years of Black Hawk operational service, incorporating substantial elements of the Black Hawk's engine, transmission and drive train systems.

Unfortunately for Sikorsky, they have yet to deliver the H-92 to a military customer, which was seen as a negative in the competition particularly given the successful international sales record of the competing NH-90.

The only military customer for the H-92 so far is the Canadian Navy, which ordered the H-92 in 2004 after a torunament procured a bare minimum contract which will see the first delivery in 2008.

The NH-90 has been developed by a European consortium of aerospace manufacturers with NH Industries, the prime contractor for the programme, a joint venture company owned by Westland of the UK. Agusta of Italy. Fokker of the Netherlands. OGMA of Portugal and Eurocopter.

Eurocopter is a subsidiary of EADS (European Aeronautics Defence and Space) company formed by DaimlerChrysler Aerospace of Germany. Aeronautic Maira of France and CASA of Spain.

The NH-90 has been ordered by France. Germany. Italy. Portugal. the Netherlands and in 2001 achieved its first order with Westland for the Royal Australian Navy's Sea King helicopters as part of a far-reaching ADF plan to rationalise the number of different helicopters in ADF service under the project name AIR 9000.

Recognising these limitations the Australian Army instigated a competition for additional battlefield troop lift helicopters as part of a far-reaching ADF plan to rationalise the number of different helicopters in ADF service under the project name AIR 9000.

The Contenders

The ADF received a number of submissions from helicopter manufacturers around the world including the EH-101 Merlin. Sikorsky's H-92 Superhawk. upgraded Black Hawks. the Eurocopter Cougar and the NH-90. During the selection process the contenders were eliminated one by one until the final decision rested between NH Industries and Sikorsky's offerings.

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NH-90

The NH Industries NH-90 is a medium helicopter offered in two different versions, the NH-90 maritime helicopter and the NH-90 Troop Transport Helicopter (TTH), which forms the basis for the Australian Multi Role Helicopter 90 aircraft (MRH-90).

Powered by twin turbine engines, the Australian MRH-90 will lift 18 fully equipped troops plus a crew of four and can deploy them via cabin doors on both sides of the aircraft and a rear cargo ramp existing under the tail boom. When the seats are removed many more troops can be accommodated.

The cabin provides some 125 cubic metres of usable space and allows the deployment of smaller vehicles such as the SAS Regiment's four-wheel two person all terrain vehicles.

Range is over 900 kilometres with a maximum speed of 300 kilometres per hour and an under: lung load of four tonnes can be carried.

The MRH-90 is air transportable by the RAAF's fleet of C-130 Hercules and strategic mobility can be achieved by deploying on board the Royal Australian Navy's current and future amphibious ships.

Four MRH-90 aircraft can be operated comfortably from each of the RAN's two Landing Platform Amphibious (LPA) HMAS MANOORA and KANIMBLA. To be able to fit the MRH-90 into the LPA's space envelope these ships must be modified to accept the MRH-90 into the LPA's hangar deck.

To further support shipboard operations the MRH-90 can fold the rotor blades and tail rotor boom, which results in a reduction in overall length from 19.65 metres to 13.5 metres.

Unlike the Black Hawk being offered in this competition the MRH-90 is built marinised while the Black Hawk is 'marineised' after build. The former provides more protection from the harsh salt air elements found at sea.

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The MRH-90 is equipped with a full fly-by-wire flight control system and night vision goggle compatible digital cockpit, and is built for passenger survival in the operational environment.

The MRH-90 is fully aerodynamic certified and incorporates a crashworthy structure and tolerance to structural and system damage in the event of a high energy impact. Taken together the MRH-90 will offer a quantum leap in capability over the ADF's current Black Hawk fleet, incorporating the most modern manufacturing and design techniques resulting in a helicopter offering a wide range of improvements in operational capability. It is also designed with upgraded crash cross-section reduction measures in the fuselage shape.

**The Implications**

The initial order placed for a total of 12 MRH-90 aircraft under Phase 2 of the AIR 9(XX) contract with Phase 4 calling up of 63 ships to engage the Allied fleet in the Philippines. Thus, as his armada approached Leyte Gulf, the battle of the Southern Force was to be decided. The 'C' Force of four aircraft carriers, two battleship-aircraft carrier hybrids with virtually no aircraft embarked and 11 destroyers, was to sail towards the Philippines from the north east, in order to entice the American aircraft carriers away from Leyte, leaving the US fleet with no air cover. A Force consisted of the super battleships YAMATO and MUSASHI with the battleships Hiei, Nachi, Nagato, and Kongo, nine heavy cruisers and numerous destroyer escorts. They were to sail from Singapore, refuel at Brunei Bay and attack the invasion fleet through the San Bernardino Strait.

The Northern Force would fight in three of the four battles that made up the battle of Leyte Gulf. The Battle of the Sibuyan Sea against US carrier aircraft from the US Third Fleet, the Battle of Samar Island with the US Seventh Fleet, and the Battle of Cape Engano, again against the US Third Fleet. The Japanese were to lose all three battles.

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The Southern Force comprised 'C' Force and the 'Second Striking Force', 'C' Force, under Vice Admiral Okane Shoji was comprised of two battleships, FUSO and YAMASHIRO, a heavy cruiser and four destroyers. It would leave Singapore, refuel at Brunei Bay, and then position itself to attack the Allied fleet from the south. The 'Second Striking Force under VADM Ozawa, and 'A' Force, under the command of Vice Admiral Kurita Takeo. Mobile Force was a decoy force of four aircraft carriers, two battleship-aircraft carrier hybrids with virtually no aircraft embarked and 11 destroyers. They would sail towards the Philippines from the north east, in order to entice the American aircraft carriers away from Leyte, leaving the US fleet with no air cover. 'A' Force consisted of the super battleships YAMATO and MUSASHI with the battleships Hiei, Nachi, Nagato, and Kongo, nine heavy cruisers and numerous destroyer escorts. They were to sail from Singapore, refuel at Brunei Bay and attack the invasion fleet through the San Bernardino Strait.
The battleship USS CALIFORNIA salvaged from the Harbor floor after the Japanese attack on Pearl Harbor, and several others were saved from the same fate. The ship was assigned to Task Force 77.3, which was commanded by Rear Admiral Russell Berkey and consisted of 81 ships, ranging from PT Boats to battleships. The PT Boats were deployed to the high explosive ammunition, the remaining supply of armour piercing shells were to be used against enemy battleships, if they appeared.

Meanwhile, Kinkaid sent Oldendorf to help in the form of every PT Boat assigned to Seventh Fleet. Thirty-nine PT Boats were stranded in Surigao Strait at high speed as part of an emerging plan of attack. They would be Oldendorf's reconnaissance in lieu of both Kinkaid's lack of night aerial reconnaissance and the departure north of Third Fleet's night aerial reconnaissance assets (enroute to ULAS Independence CVL-22). By early evening, Oldendorf's force consisted of 81 ships, ranging from PT Boats to battleships. Two night flying Catalina Flying Boats (known as "Boeing's Clocks") tried to find the Japanese but without success. One of them was mistakenly shot down by the PT Boats, now in position on the western end of the strait.

At 1800hrs VADM Nishimura received word of 'A' Force's delay from air attacks in the Sibuyan Sea. Nishimura ordered this Mobile Force to make their attacks the night before he was alone. There would be no support from the north of the gulf. At 1900hrs all ships signal was sent by ADM Toyoda: "All ships dash to the attack, counting on divine intervention. The success or failure of all depends on the night.

After sunset Oldendorf executed his plans. For RADM Weyler and his battleships, WEST VIRGINIA, CALIFORNIA, PENNSYLVANIA, MARYLAND, and TENNESSEE, this was the moment they had waited for since that “Day of Infamy”. These were ships salvaged from the water (PENNSYLVANIA was in drydock and was damaged during the attack at Pearl Harbor refitted). Along with the battleship MISSISSIPPI, Weyler’s flagship, the battle line was complete, and was escorted by the six destroyers from Destroyer Division X-Ray. The six battleships were steaming in ‘Line Ahead” formation across the strait, waiting for the enemy to arrive.

Further to the strait on the right flank were RADM Berkey’s ships. Flying his flag from the Pearl Harbor survivor, the cruiser USS PHOENIX (CL-44), Berkey had HMAS SHROPSHIRE along with the cruisers USS BOISE (CL-47) and two destroyer squadrons, DESRON 54, to the south of seven destroyers, and DESRON 23 consisting of six destroyers including HMCS ARUNTA. On the left flank, Oldendorf onboard his flagship LOUISVILLE, led the cruisers MINNESOTA (CA-36), DENVER (CL-94), PORTLAND (CA-33), and COLOMBIA (CL-56), together with Destroyer Squadron 56, consisting of nine destroyers. Near the western exit of the strait 39 PT Boats waited in thirteen groups of three, each on the other side of the mouth of the strait, waiting to report back to the admiral.

Eighty-one Allied warships waited in and around Surigao Strait, without aircraft carrier support. The updated fire control radars of Oldendorf’s fleet watched for the seven ships of Nishimura’s “C” Force. which were moving towards them, unaware of what was waiting for them on that moonless night.

From Nishimura’s flagship YAMASHIRO, the only light the crew saw was the lightning of a midnight storm on the southern horizon over Mindanao. Several ships in “C” Force had an early version of a fire control radar supplied by Germany and fitted before Operation Sho-B began. It was hoped that this would be a decisive advantage.

The late evening of 24 October, “C” Force arrived at the western end of Surigao Strait. Nishimura ordered the MOGAMI and the three destroyers MICHISHIO, ASAGUMO, and YAMAGUMO to proceed ahead to conduct reconnaissance for the rest of the force to the four PT Boats heading east into the strait. The PT Boats were searching for managed to pass each other undetected, As-
SHIGURE spotted them. On hearing that contact with the three ships was made, FUSO, YAMASHIRO and SHIGURE began to move into the strait. At 2250, YAMASHIRO opened fire. The barrage forced the PT Boats to cease their attack and retreat. The PT Boats were running in at 40 knots when the SHIGURE, FUSO, and YAMASHIRO continued east.

Meanwhile, Vice Admiral Shima's 'Second Striking Force' was northwest, with two groups of destroyers. The destroyers MICHISHO, SHIGURE, ASAGUMO and YAMAGUMO and by 0100hrs they sailed eastwards as a fleet. The PT Boats conducted their last attack during this time, with PT 483 damaged by gunfire and PT 489 damaged by shellfire. At 0215hrs, the PT Boats were behind them, and 'C' Force continued onwards. Shortly after, Nishimura ordered his ships to battle formation.

Candidate for the occasion being Dr. Susanna Herd, her father having served on the original BALLARAT during World War II. Dr. Herd had named and launched BALLARAT originally at Williamstown in May 2003. Other distinguished guests included the Minister for Defence Hon. Robert Hill, the Chief of Navy Vice Admiral Dickson and the then Maritime Commander Rear Admiral Rawdon Gate.

Conducting the ceremony and taking command of HMCS BALLARAT was Commander David Hunter who together with the efforts of his cheerful crew turned on a wonderful spectacle for the invited guests and the public on the evening.

By Kevin Dunn
A PROUD AMERICAN
The Autobiography of Joe Foss
Review copy supplied by:
Cruiser Books
9 Townsville St, Fyshwick, ACT 2609
www.cruiserbooks.com.au
(02) 6235 2352
RRP $71.50
Reviewed by Lionel Hutz

In America, Joe Foss is one of the best-known personalities to have emerged from World War II. Fortunately, Joe and his wife "doll" skillfully put his remarkable stories into this fascinating book, A Proud American.

Joe Foss was a genuine American hero who is said to have later served as a role model for the youth of America.

As a small town farm boy whose father died in a tragic accident when Joe was still a teenager, he willingly accepted the responsibility of providing for his family's financial needs. Despite great obstacles, Joe went on to live the American dream. He enjoyed several highly successful careers, from a World War II Top Marine Fighter Ace with Distinguished Flying Cross; Congressional Medal of Honor recipient; Brigade General and Chief of Staff, South Dakota Air National Guard to a US Coast Guard Lt. Commander of the American Football League; to a Television Actor. But above all, Joe Foss was a genuine American hero who is said to have established for the youth of America.

For readers of THE SAT's book deals with his World War exploits in the Pacific theatre flying over embattled Guadalcanal in the very darkest days of the summer and winter of 1942-43, this aggressive and talented Leatherneck is the story of the American ship's and Australian men who served with the US Army Small Ships Section in New Guinea during the Second World War.

Forgotten Fleet 2 is the story of the American ships and Australian men who served with the US Army Small Ships Section in New Guinea during the Second World War.

This book is a credit to its authors. From the outset it is very apparent that an enormous amount of research has gone into producing this high quality publication. Forgotten Fleet 2 is the story of the American ships and Australian men who served with the US Army Small Ships Section in New Guinea during the Second World War.

Forgotten Fleet 2 is a compendium of thousands of facts covering approximately 1,000 vessels and more than 1,500 personnel. The degree to which the authors have researched is overwhelming. In fact it spans 367 pages of information and photographs. The book is arranged via Part A, comprising 15 chapters, a summary of history from the beginning to victory, then Part B, based around eight Tall Tales and True, then Part C covering the ships and their personnel.

What is most outstanding are the special features, additional stories from the personnel in their own words, spread through the book. Some subjects include: The Small Ships Experience. Undisciplined. Cruising in Style. Milne Bay Story. and The Australian Command.

The ships of the Forgotten Fleet were an odd assortment. Lug boats. ketches. old ferries, a former Great War four stacker destroyer. a paddle wheeler, through to new purpose-built fighters, lighters, launches and even an old South Australian colonial light cruiser. HMCS, later HMAS PROTECTOR rates a mention.

Highly recommended. To secure a copy of Forgotten Fleet 2, contact the authors on (02) 4922 8437 or fax on (02) 4922 8423

THE LAST SAMURAI - DVD
Movie
Warner Brothers
Rated MA
RRP $28.95
Reviewed by James Richards

Possibly one of the year's strongest DVD releases. Tom Cruise's latest action epic is an exciting and violent tale of the tragic fall of the samurai culture as Japan entered the modern age.

Featuring Cruise as a washed-up American civil war captain invited to Japan to train the Emperor's army in modern warfare; this is the actor's best work to date.

While Cruise excels as a washed soldier who finds solace in the culture and sense of battlefield honour of the samurai after having initially been taken as their prisoner, it is his Oscar nominated co-star Ken Watanabe who truly owns the film.

As the remaining samurai leader loyal to his Emperor but forced to battle his modern army to preserve the samurai people, and culture, Watanabe's warrior is an impressive man of action and intense personal reflection.

On DVD, The Last Samurai looks and sounds phenomenal. Visually the film is crisp with the New Zealand scenery a stunning substitute for Japan and little grain or shadowing apparent on screen during the film's numerous battles, training montages and night sequences.

Featuring a second disc of well crafted and carefully managed extras, the two-disc set also offers viewers an intriguing insight to the highly detailed production, complexity of the actor's training, orchestration of the film's battle scenes and a showcase of samurai history.

For enthusiasts of the samurai, lovers of quality action films and fans of epic cinema, The Last Samurai is exciting in its action and emotive in its depiction of a culture lost.

STRIKE FROM THE SEA
The Royal Navy and US Navy in the Middle East 1949 - 2003
By lain Balintyne
Pen & Sword Books Limited
ISBN: 1 84415 053 X
Reviewed by Lionel Hutz
Price: £19.95
Hardback

e-mail: enquiriesto pen-and-sword.co.uk

The Arabian Gulf has been at the centre of the world stage for over many years, the region's geopolitical importance, upon which the global economy depends. In this fascinating book, Bain Ballantyne examines the role of the British and American navies, charting their actions from shortly after the Second World War to the present day. He describes the US Navy and Royal Navy response to various disputes down the decades, from the Abadan Crisis of 1951, the Suez crisis of 1956, the Tanker War of the 1980s, confronting Libya, DESERT STORM in 1991, the post September 11th War on Terrorism and, finally, the Iraq War of 2003 that deposed Saddam Hussein.

The author's contacts within the US and UK naval commands have given him inside stories of tense deployments and combat action, with many people speaking for the first time about their key roles and the risks they faced. Of particular interest to naval enthusiasts will be the descriptions of evolving naval tactics, including the critical importance of aircraft carriers projecting power. The contribution made by other fleets in recent wars, particularly the Royal Australian Navy, is not overlooked. However, it is the 'Special Relationship' embodied by the Anglo-American naval pact that lies at the heart of this vivid account, which does not ignore moments of US-UK tension.

Strike From The Sea has wide appeal as a well-written and accessible insight, from a naval perspective, on what has been, and remains, one of the world's most dangerous flashpoints. The authoritative text is superbly supported by a splendid selection of photographs, most of them reproduced in colour.

Iain Ballantyne is editor of the global naval affairs magazine Warships IFR and has been a contributor to THE NAVY since 1989, the author of WARSPIES and HMS LONDON, the first two titles in Pen & Sword's Warships of the Royal Navy series.

THE BATTLE OF BRITAIN - DVD
Movie
2-Disc DVD
Wide Screen edition
MGM
Directed by Guy Hamilton
Reviewed by Steve Bennett
Price: £28.95

Despite being a dramatised version of historical events, The Battle of Britain sticks closely to the facts, and doesn't try to overplay history. As well as honouring the brave pilots, it also points out the sequencies of events and bad decisions that contributed to the German defeat and the problems faced by the RAF.

Great acting by a whole host of household names from the high water mark of the British film industry (Michael Caine, Kenneth More, Laurence Olivier, Robert Shaw, Susannah York, and Trevor Howard, to name but a few) is largely responsible for the success of this film.

Scraping together aircraft from museums and enthusiasts all over the world, as well as loaning ME-109s and HE-111s from the Spanish air force, the filmmakers managed to capture very believable aerial action regarded by many as still better than modern movies like 'TOP GUN'. Using an airborne camera crew working inside a Spitfire, we see Spiffleres, Hurricanes, ME-109s, and Heinkels blasting all over the sky in all manner of dog fighting. When you discover they filmed different bits of all the fights in different parts of Europe, with different numbers of aircraft (sometimes only one British fighter) then seamlessly joined it all together, it makes it an even more amazing feat.

The film also manages to fit a broad coverage of different aspects to the story, within its 2 hour runtime. We don't just see the pilots, but also the Fighter control system that was in place (including the vital radar operators and members of the observer corps), the people in power making the decisions, the people of London, the foreign squadrons, and even the German point of view.

Due to the lack of available Hurricanes, you sometimes get the impression that the Spitfire won the battles, when in fact it was Hurricanes that made up the majority of the RAF at the time and thus regarded as the decisive weapon of the battle as they went after the bombers.

This is presented in widescreen (16:9 enhanced). This is the original theatrical aspect ratio and having only seen the film before on TV I can’t believe I was ever satisfied with that horrible 4:3 version. If you are a fan of this movie or think it was ‘pretty good’ then you need to see it again in its widescreen glory.

Five further additional features involving documentaries on the making of this magnificent movie are included on the second disc. The video text is a great bonus for a film that’s 35 years old. Sound has been done in Dolby 5.1 for fantastic sound effects of the battles and that unique sound of the sputtering engines.

The Battle of Britain 2-Disc DVD set from MGM is highly recommended, tally ho.

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STRIKE FROM THE SEA
The Royal Navy and US Navy in the Middle East

49er

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e-mail: enquiriesto pen-and-sword.co.uk
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 capability to defend itself, paying particular attention to maritime defence. Australia is, of geographical necessity, a maritime nation whose prosperity 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 a defence capability which is knowledge-based with a prime consideration given to intelligence, surveillance and reconnaissance.
- Advocates the acquisition of the most modern armaments and sensors to ensure that the ADF maintains some technological advantages over forces in our general area.
- Believes there must be a significant deterrent element in the Australian Defence Force (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 littoral and jungle warfare as well as the defence of Northern Australia.
- Supports the development of amphibious forces to ensure the security of our offshore territories and to enable assistance to be provided by air as well as by air to friendly island states in our area.
- Endorses the transfer of responsibility for the coordination of Coastal Surveillance to 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.
- Advocates the development of a defence industry supported by strong research and design organisations capable of constructing all needed types of warships and support vessels and of providing systems and sensor integration with through-life support.

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 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 will lack air defence and have a reduced capability for support of ground forces.
- Advocates the very early acquisition of the new destroyers as foreshadowed in the Defence White Paper 2.
- Advocates the acquisition of long-range precision weapons to increase the present limited power projection, support and deterrent capability of the RAN.
- Advocates the acquisition of unmanned surveillance aircraft such as the GLOBAL HAWK primarily for offshore surveillance.
- Advocates the acquisition of sufficient Australian-built afloat support ships to support two naval task forces with such ships having design flexibility and commonality of build.
- 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 that in any future submarine construction program all forms of propulsion be examined with a view to selecting the most advantageous operationally.
- Advocates the acquisition of an additional 2 or 3 updated Collins class submarines.
- Supports the maintenance and continuing development of the mine-countermeasures force and a modern hydrographic/oceanographic capability.
- Supports the maintenance of an enlarged, flexible patrol boat fleet capable of operating in severe sea states.
- 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 current economic problems and budgetary constraints, believes that, given leadership by successive governments, Australia can defend itself in the longer term within acceptable financial, economic and manpower parameters.
(From R to L) HMAS Ships NEWCASTLE, SUCCESS and PARRAMATTA at sea and transiting to Hawaii for RIMPAC 2004. (RAN)

The RAN Collins class submarine HMAS RANKIN just below the surface during war games off Hawaii during RIMPAC 2004. (USN)
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The Canadian destroyer HMCS ALGONQUIN steams in formation with USS JOHN C. STENNIS (CVN-74) during RIMPAC 2004
PLEASE NOTE

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SOME PAGES MAY CONTAIN POOR PRINT, TIGHT BINDING, FLAWS AND OTHER DEFECTS WHICH APPEAR ON THE FILM