

THE NAVY



THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

**FROM THE
SEA TO THE
BEACHHEAD –
ROKNS DOKDO
(LPH-6111)**

**LCS MISSION
TAKES SHAPE
FREEDOM
COMMISSIONS,
INDEPENDENCE
READIES FOR
SEA TRIALS**

**THE
CONVERSION
OF TSMV
KANIMBLA TO
AN ARMED
MERCHANT
CRUISER
IN 1939**

**MINE WARFARE
IN AUSTRALIAN
& NEW ZEALAND
WATERS**



ISSN 1322-6231



AUSTRALIA'S LEADING NAVAL MAGAZINE SINCE 1938

\$5.95
INCL. GST



THE NAVY LEAGUE OF AUSTRALIA

THIRD ANNUAL MARITIME AFFAIRS ESSAY COMPETITION 2009

The Navy League of Australia is holding a third maritime essay competition and invites entries on either of the following topics:

TOPICS

- 20th Century Naval History
- Modern Maritime Warfare
- Australia's Commercial Maritime Industries

CATEGORIES

A first, second and third prize will be awarded in each of two categories:

Professional, which covers Journalists, Defence Officials, Academics, Naval Personnel and previous contributors to *The Navy*; and

Non-Professional for those not falling into the Professional category.

Essays should be 2,000-3,000 words in length and will be judged on accuracy, content and structure.

PRIZES

- **\$1,000, \$500 and \$250** (Professional category)
- **\$500, \$200 and \$150** (Non-Professional category)

DEADLINE

29 August 2009

Prize-winners announced in the January-March 2010 issue of *The Navy*.

Essays should be submitted either in Microsoft Word format on disk and posted to:

Navy League Essay Competition
Box 1719 GPO, SYDNEY NSW 2001

or emailed to editorthenavy@hotmail.com.

Submissions should include the writer's name, address, telephone and email contacts, and the nominated entry category.

The Navy reserves the right to reprint all essays in the magazine, together with the right to edit them as considered appropriate for publication.





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Front cover: Austal's contender for the USN's LCS contract, INDEPENDENCE, nearing completion of fitting out for sea trials to commence. (USN)

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Deadline for next edition 5 Feb 2009

DEFENCE PROJECT SEA 100 – FORT DENISON REACTIVATION AND MODERNISATION. ISSUE FOR THE WHITE PAPER?

In 1857 Fort Denison in Sydney Harbour was completed as a counter to potential Russian naval aggression against the settlement of Sydney. The Crimean War was being fought in Europe and thoughts of a Russian attack were high on the minds of the then government.

Wind the clock forward 152 years and we still find Russia presenting a threat to the peace and stability of the world. Recent actions and comments by its leadership have prompted some strategic analysts to suggest that we may already be in a new Cold War with the old enemy.

This new Cold War can be linked to Russia's dangerous political shift towards Fascism led by Vladimir Putin and his anti-Western Hawks. His grip on power, despite being the Prime Minister - due to Russian Constitution restrictions on length of Presidencies - seems as sure as ever through his protégé, Dmitry Medvedev. This was first demonstrated when Prime Minister Putin selected the Government's Cabinet, the first time the head of state had not done so since the Bolshevik revolution of 1917. Predictably it was stacked with Putin follower and anti-West hardliners.

Currently in the Russian media NATO expansion and US actions in the Middle East are exaggerated to look like threats to Russian security. This has the effect of making the Russian public more willing to accept Putin's Fascist rule through fear of the West – use of fear is a standard trick used by all dictators from Hitler to Mugabe to boost their credibility.

Putin's ultimate goal seems to be the reintegration of Russia under the old Union of Socialist Republics model. Putin is already on the record as describing the collapse of the Soviet Union as the greatest geopolitical tragedy of the 20th century, one which he hopes to reverse. During his Presidential tenure Russian school textbooks were changed to present Stalin as the most successful Russian ruler of the 20th century. The Soviet national anthem was reinstated and Putin is always reminding Russians to be proud of the achievements of the Soviet State.

Russia's recent military actions in Georgia would seem to confirm the move to reintegration of the old USSR through her heavy handed approach to the former Soviet state when it 'got out of line'. The assault on Georgia was also certainly a show of force to the other former Soviet republics that 'Mother Russia' has a temper and that the West can and will do nothing to help.

A surprising aspect of the Georgian military campaign was the speed, efficiency and joint nature of the operation. Army, Navy, Air Force and

Marines descended on Georgia in a crushing defeat many thought the 'Old Bear' was incapable of inflicting on anyone. It would seem Russian Military prowess is back.

Since then Russian BEAR, BACKFIRE and BLACKJACK bombers have recommenced their old Cold War patrol routes, fully armed. Harassment by long range bombers of USN CBGs (Carrier Battle Groups) and near incursions into British airspace to test responsiveness are also on the rise. Russian SAGs (Surface Action Groups) and CBGs are also making a comeback in the waters of the Atlantic with a SAG recently visiting Venezuela and for joint military exercises.

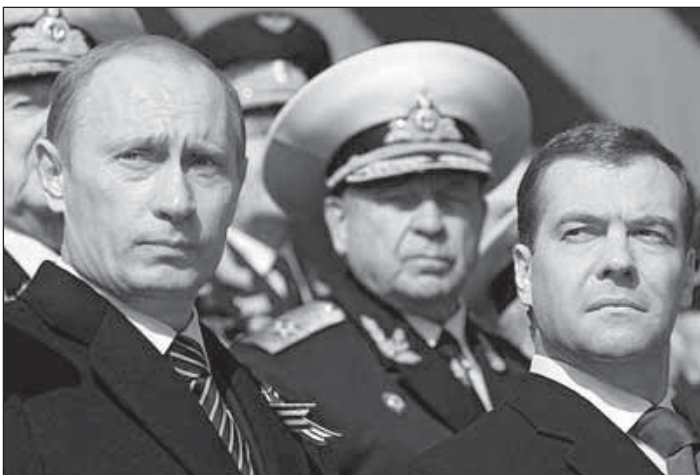
Russia is also increasing its defence spending, which incidentally rose 60% under Putin as President. Russia's military resurgence recently took on a new complexion with the announcement by President Medvedev of a new aircraft carriers and nuclear powered submarines to strengthen Russia's international standing, influence and reach.

Russia's recent actions and statements are somewhat reminiscent of Germany post WW I. After a crushing defeat Germany spent over a decade trying to regain its lost pride with the underlying goal of punishing those who were responsible. It did this through a swing from weak democracy to the political extreme of Nazism.

With its defeat at the end of the Cold War Russian pride was hurt deeply at the loss of Super Power status. Lower living standards, rampant crime and political uncertainty were all blamed on her Cold War defeat. Added to this was the feeling of helplessness and betrayal at not being able to help its ally Serbia during NATO's offensive in the Balkans during the 90s. Russia's defeat in the Cold War and subsequent swing towards Fascist rule would seem to indicate it is on a similar path to post WW I Germany. This may have disastrous results for the world.

With this in mind Australia's Defence White Paper writers should be asking the question 'how soon will Russian naval assets be seen in Australian territorial waters, again' and what sort of navy is needed to counter this? During the Cold War several incursions by Russian submarines were detected. The two most notable being in Jervis Bay and another off the Kimberly coast. In both cases the submarines escaped without being properly identified. Australia's should also be reminded that we are still within range of Russian nuclear armed Inter-Continental Ballistic Missiles (ICBMs).

As no one in the West can change Russia internally, a strategy of containment of her military's international reach may be required if her Fascism escapes its borders on flights of mock nationalistic defence. History has shown it always does. Perhaps it would be prudent for the new Defence White Paper to reactivate and modernise the role that Sydney's Fort Denison had in order to counter the reach of 'the new Bear'?



Prime Minister Putin (left) and his protégé, President Dmitry Medvedev.



Sydney Harbour's Fort Denison. The Fort stands as a reminder to Australia's reaction to Russian expansion and aggression over 150 years ago. Will Australia react again?

NAVY LEAGUE AGM

The Annual Meeting of the League and of the Federal Council of the League were held in Canberra on 31st October – 1st November.

The activities of the League are spread widely around Australia. These gatherings are always a good opportunity for the representatives of our State Divisions and the Federal organisation to meet to discuss the many maritime issues of concern to the League. Of course, as with any organisation, such a meeting is also an opportunity to review how we are operating and to consider how to do things better.

The 2008 meeting was very well attended with good representation from every State Division.

Our meeting began with a visit to Navy Headquarters in Russell Offices to receive a briefing from Navy. This year the briefing was presented by Rear Admiral Steve Gilmore AM, CSC, Commander Australian Navy Systems Command. These briefings are greatly appreciated by the members of the Federal Council. They represent a great opportunity to learn about naval activities and developments and to gain an insight into Navy thinking on current issues.

A feature of our weekend was the Cocktail Reception held at the Brassey Hotel. This year it was sponsored by CEA Technologies. All present, both League members and guests, thoroughly enjoyed the occasion.

A highlight of the evening was the presentation given by Mr Kent Lascelles, CEA Project Manager. CEA is an Australian, Canberra based, technology company. Kent Lascelles entertained those present while providing information on CEA's CEAFAR and CEAMOUNT products.

CEAFAR is an active phased array radar with a unique microwave tile-based design. The combination of the microwave tile and the Digital Beam Forming (DBF) backend provides a modular, programmable and scalable solution. Features of the radar include:

- scalable in size and power to meet a broad range of applications, suitable from 'Corvettes to Cruisers';
- full 3D multifunction search capabilities;
- advanced classification capabilities;
- optimised for littoral and open ocean;
- evolves to meet changing requirements;
- very high reliability, no in-mission maintenance.

CEAMOUNT is an active phased array solution providing target illumination and missile up-link for semi-active homing missiles like the ESSM. The system provides a high-power, light-weight phased array illuminator. CEAMOUNT is mounted on a fixed face panel.

Its features include:

- An X-band active phased array illuminator;
- electronic beam steering;
- services multiple target / multiple axis engagements simultaneously;
- capable of supporting multiple channels of fire;

- supports all X-band guidance modes;
- maximises missile/combat capabilities;
- high levels of redundancy.

He finished his presentation on phased array radar with a short video. It certainly got the attention of our guests.

CEAFAR and CEAMOUNT are to be employed under Project SEA 1448 to provide an enhanced anti-ship missile defence system for the Anzac class. Once installed, the system will allow for the simultaneous engagement of 16 targets (plus one more with the legacy mechanically steered illumination radar).

Each year the Federal Council awards the Navy League of Australia Perpetual Trophy – Community Award. The purpose of the award is to recognise the strong community support ethic within Navy.

From among the various ships and establishments which nominate for the award each year Deputy Chief of Navy selects three finalists. This year the three were HMAS NEWCASTLE, HMAS KUTTABUL and HMAS SIRIUS.

After considering the contestants submissions the Federal Council decided in favour of HMAS NEWCASTLE. The Council was in particular most impressed with what was, rightly, said to be the Ship's strong and enduring support for the City of Newcastle and the surrounding Hunter region.

HMAS KUTTABUL and HMAS SIRIUS were both worthy finalists and deserve congratulations on their efforts.

In 2007 the League introduced the Maritime Essay Competition. Following its success last year Federal Council confirmed that it would thereafter be an annual event.

The 2008 competition invited entries on the topics of either '20th Century Naval History' or 'Modern Maritime Warfare'. Many fine entries were received.

In the end the Selection Panel had to decide from a short list of 14 entries, seven in the professional category and seven non-professional.

A computer generated image of the improved ASMD Anzac class with CEA's CEAMOUNT and CEAFAR radars. (CEA)



First place in the professional category went to Petty Officer Pete Cannon for an essay "The Conversion of TSMV KANIMBLA to an Armed Merchant Cruiser in 1939" (see this edition). PO Cannon provides an excellent description of KANIMBLA's requisitioning, conversion and preparation for service as a warship. There is clearly something to be said for serving in a converted passenger ship. Apparently when HMS KANIMBLA went to war she retained her first class cabins and a swimming pool!

Second place, and a prize of \$500 went to Commander Greg Swinden for "The Australian Naval and Military Expeditionary Forces and the Capture of German New Guinea 1914". A story well told and well worth telling. As the essay puts it, First to Fight!

Third place, and a prize of \$250 was won by Commander David Hobbs MBE, RN (Rtd) for "Super Hornet – The USN's Future" (See Vol 70 No.3 Jul-Sept 08 edition of *THE NAVY*). A typically professional piece by last years first prize winner.

The non-professional category contained an interesting and varied selection of topics.

First place and the \$500 prize was awarded to Mr Murray Dear of Hamilton New Zealand. His topic was "Mine Warfare in Australian & New Zealand Waters" (see this edition). A well written reminder of the damage mines wrought in our waters in both World Wars.

Second place with a prize of \$200 was gained by Mr Peter Ingram. His topic of "French Naval Forces in the Pacific 1941-45" covered a little known or remembered area of naval activity.

Third prize of \$150 went to Ludwig von Gress for "Maritime Will". His essay is as singular as his nom de plume.

The League thanks all those who submitted essays in 2008. We look forward to receiving your essays and those of many others in the 2009 competition.

Of course Federal Council considered many other matters in addition to the award of prizes. At a meeting such as this a great many issues are raised. Discussion can cover the whole gamut of maritime matters.

Issues raised this year included the Defence White Paper, Australian merchant shipping, the proposed new submarines, recruiting and retention in the RAN and STOVL aircraft. The welfare of the Australian Navy Cadets, an organisation with which the League has had a long connection, is always the subject of debate.

This year Federal Council spent a good deal of time in developing a strategic plan for the League.

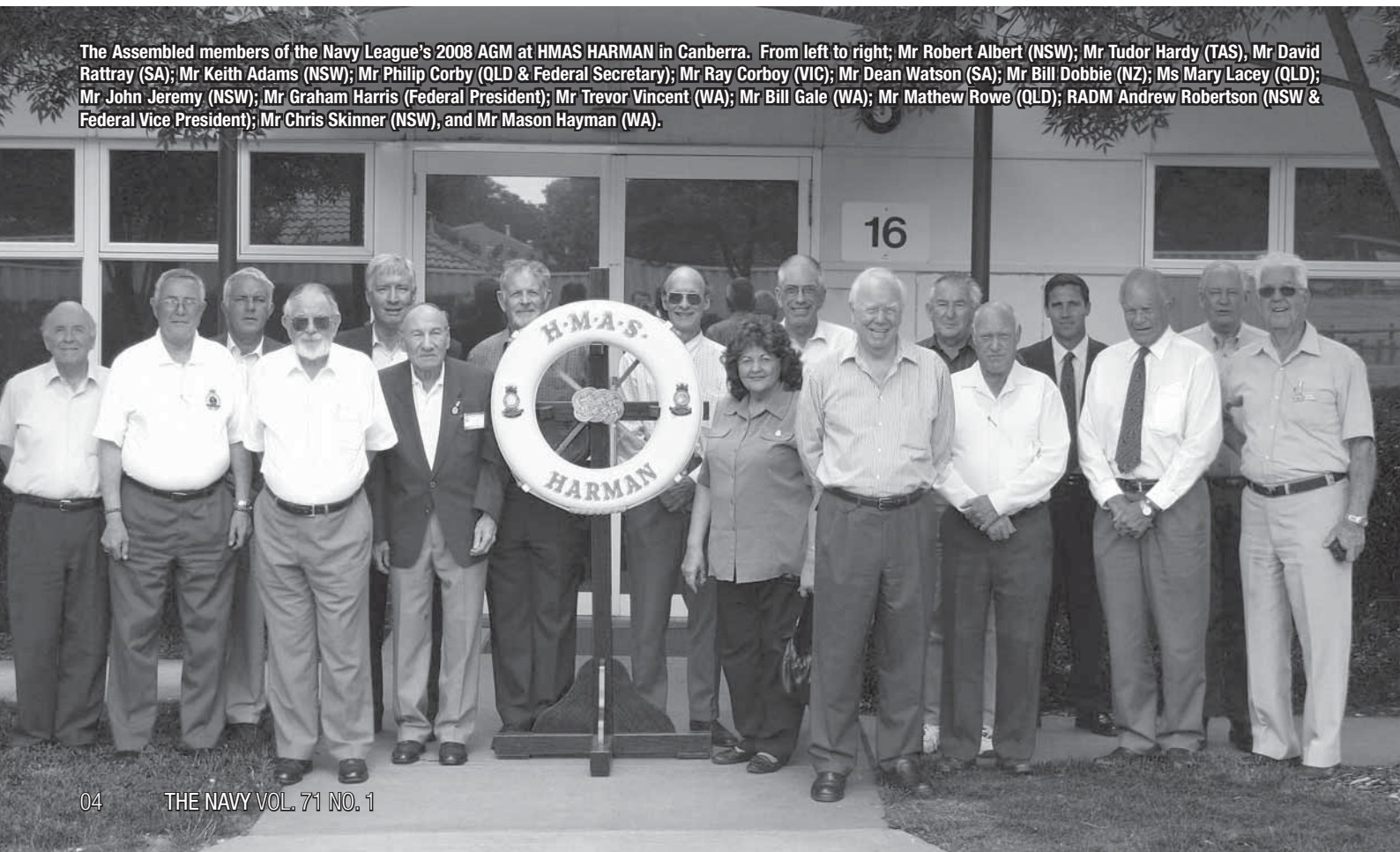
As they do each year the State Divisions presented their reports to Federal Council. Once again these reports demonstrated the range of activities in which the League is involved.

It was a most enjoyable conference. Next November we will all be back in Canberra. Federal Council is considering meeting in other places, but that will be for 2010 or beyond.

Footnote. The capture by Somali pirates of the super-tanker *Sirius Star* has got world-wide attention. Readers of this magazine have no doubt been aware for some time of the problems of piracy. The South China Sea, Malacca Straits and the west coast of Africa, for example, have been piracy hotspots for years.

Very little good can be said about pirates, but at least the activities of the Somalis have reminded the world of the immense value of maritime trade and of the need to maintain secure sea lines of communication.

The Assembled members of the Navy League's 2008 AGM at HMAS HARMAN in Canberra. From left to right; Mr Robert Albert (NSW); Mr Tudor Hardy (TAS), Mr David Rattray (SA); Mr Keith Adams (NSW); Mr Philip Corby (QLD & Federal Secretary); Mr Ray Corboy (VIC); Mr Dean Watson (SA); Mr Bill Dobbie (NZ); Ms Mary Lacey (QLD); Mr John Jeremy (NSW); Mr Graham Harris (Federal President); Mr Trevor Vincent (WA); Mr Bill Gale (WA); Mr Mathew Rowe (QLD); RADM Andrew Robertson (NSW & Federal Vice President); Mr Chris Skinner (NSW), and Mr Mason Hayman (WA).



FROM THE SEA TO THE BEACHHEAD

ROKNS DOKDO (LPH-6111)

By Ian Johnson

On 3 July 2007 South Korea commissioned the ROKNS DOKDO (LPH-6111) into its navy, vastly improving the Republic of Korea Navy's (ROKN) amphibious capabilities from a small amphibious force to a medium sized blue water force.

GENESIS

In the late 1990's the ROKN had drawn up plans for a new fleet of ships for their navy from submarines to new destroyers and frigates and other classes of ships. As part of the plan, in January 2000 the South Korean Government announced their intention to build a 10,000-ton dock landing ship, capable of carrying 700 troops and operating both landing craft and helicopters. Known as the LPX project, it was the cornerstone of three rapid response fleets for the Republic of Korea Navy that was part of former President Kim Dae Jung's plans for a blue water navy by 2020.

The LPX provided a transformation of the amphibious warfare arm of the ROKN, which until DOKDO's commissioning relied on the tank landing ships (LST) of the Goojoonbong class and six ex-USN LST's that were built at the end of the Second World War but modernised. These LST had a low top speed and needed to beach themselves to land troops and equipment, placing them at risk from air attack during the assault.

The LPX project also represented the largest military shipbuilding project in South Korean history and as plans for the LPX were concluded it grew to 14,000 tons, with the possibility of Vertical, Short Take-Off and Landing (VSTOL) aircraft operations, and with the potential to operate as a flagship.

DESIGN

The lead ship of the class, DOKDO began construction in early 2003 at the Hanjin Heavy Industries & Constructions Co in Busan it was the largest amphibious warfare ship built in Asia at the time, surpassing the Japanese Osumi-class dock landing ships. At 18,860 tons fully loaded, 200m long and 32m wide DOKDO's design is loosely based on the USN's WASP class amphibious assault ships, with inclined sides to reduce radar return, a flight deck and a aft well deck that can launch landing craft. Just over two years later DOKDO was launched on 8 July 2005. For the next two years DOKDO fitted out and conducted extensive sea and helicopter trials, before her 2007 commissioning. The lessons learned with DOKDO have been incorporated into her sister ship MARADA, which is due for completion in 2010. A third ship BAEKNYENDO is under construction and is believed to be a modified version of the class, expected to be larger at 20,000 tons and built with VSTOL aircraft capability. If so, when commissioned in 2011 BAEKNYENDO could be viewed as the ROKN's first aircraft carrier.

The DOKDO class was designed to operate as the flagship with large command and control (C2) suites to command either an amphibious task force, or a rapid response fleet with the new KDX-II and KDX-III class destroyers, FFX frigates, and KSS submarines, as well as function as a command post in civil emergencies i.e. natural disasters.

ROKNS DOKDO (LPH-6111). The new South Korean LPH is capable of embarking 720 troops, 10 Blackhawk sized helicopters as well as landing craft for 10 tanks and 31 other armoured vehicles. (ROKN)



A South Korean Navy UH-60P Blackhawk helicopter on the flight deck of DOKDO. The flight deck has two elevators to the hangar and five helicopter landing spots. (ROKN)



DOKDO was named after South Korea's easternmost islets (which Korea and Japan are in a diplomatic fight over) in the East Sea.

CREW

The 426 officers and crew that make up the ship's company. They are accommodated in what is said to be "high standard berthing" areas on ship. Officers, senior enlisted and junior ratings have their own mess and recreation areas onboard. Well equipped medical facilities, as well as dentist facilities, allow her to act as a primary casualty receiving ship.

COMMAND AND CONTROL

As a flagship, DOKDO is outfitted with an advanced Command, Control, Communications,

Computers, Intelligence, Surveillance, Reconnaissance and Targeting, Acquisition (C41SRTA) system in a joint venture developed by Samsung and Thales Corporation. It includes theatre battle management system, connecting DOKDO's sensors and radars giving the ship an overall operational picture of the sea, ground or air environments. She has capacity for a battle management staff of 150.

RADAR

For air search, DOKDO and her sister ships are equipped with the Thales Nederland SMART-L (Signaal Multi-beam Acquisition Radar for Targeting, L-band) long range 3D radar and the MW-08 air/surface search radar. The SMART-L has a range of up to 400 km and can detect up to 1000 air targets and 100 surface targets plus track 32 electronic countermeasure jammers. It is claimed the radar can detect a stealth aircraft at 65km, a fighter at 220kms and a maritime patrol aircraft at 400kms. It has an electronically stabilised antenna that rotates at 12rpm. The

radar is so powerful it can be used for the theatre ballistic missile defence role.

The smaller short range MW-08 can track up to 10 surface and 20 air targets simultaneously at up to 150 kilometres and up to speeds of Mach 4. It can also control two guns in a surface engagement mode.

DOKDO is also equipped with an SPS-95K surface search/navigation radar with an instrumented range of 200kms.

PASSIVE DEFENCE MEASURES

The Electronic Warfare suite is known as the Sonata system. The passive part of the system is made up of three 'pot' like radomes on the main mast which are the surveillance elements. On the roof of the bridge and just behind are two turreted ECM jammers which can be trained in different directions. There is also a third jammer turret at the rear of the island superstructure covering the aft quadrant of the ship.

For torpedo defence the Korean SLQ-260X TACM torpedo counter-measure system is used. It is thought this system decoys torpedoes by throwing decoys into the water and away from the ship.

For chaff launching the class uses the French Dagaie Mk-2 chaff launcher systems.

For damage control the ship is divided into segregated zones with vertical ventilation systems. Each zone has its own air-conditioning

An enhanced image depicting the sensor and weapon arrangements of the Dokdo class.

- 01 Aft facing 30mm Goalkeeper;
 - 02 The Thales Nederland SMART-L 3D air search radar;
 - 03 One of the three turreted ECM jammers;
 - 04 The passive surveillance elements of the Sonata electronic warfare system;
 - 05 An MW-08 air/surface search radar;
 - 06 A commercial navigation radar;
 - 07 An SPS-95K surface search/navigation radar;
 - 08 Mk-49 RAM launcher.
- (Chris Sattler)



and NBC (Nuclear Biological and Chemical) filtration system. The ship is fitted with fire proof doors to support the integrity of each segregated zones and fire resistant materials have been used on all bulkheads. A large amount of real time monitoring equipment is placed throughout the ship to provide instant warning to the Damage Control room of smoke, fire or flooding.

WEAPONS

With the expectation that DOKDO would be part of a task force during future missions, it was decided that the ship needed a weapons suite for self defence.

DOKDO was commissioned with two highly effective Goalkeeper CIWS (Close In Weapons Systems). Which are located on the bow for forward hemisphere coverage (about 240 degrees) and high at the rear of the island superstructure covering the stern hemisphere with about 270 degree coverage. Both guns can provide interlocking fields of fire for targets on the ship's beam.

Goalkeeper is an autonomous close-in weapon system in which the entire engagement sequence from search to destruction is carried out automatically. The system consists of a gun, an I-band search radar, an I/K-band tracking radar, a TV camera and separate transmitter and receiver cabinets.

It uses the GAU-8A 30-mm seven-barrelled gatling gun, able to output a maximum rate of fire of 4,200-rounds a minute with a reliable factor of 33,000 mean rounds between stoppages.

The magazine loading system has an ammunition capacity of 1,190 rounds carried in a linkless system using a feed and storage drum below deck. Spent cases are returned to the drum to prevent deck debris after firing (important on deck operating aircraft). The ammunition capacity is claimed to be sufficient for several target engagements before reloading is necessary.

To ensure detection of small targets in dense clutter the radar includes digital pulse compression. Digital moving target detection is used to provide accurate ranging. Dual receiver channels are used to speed up Doppler processing, plot extraction and track build-up. This 2-D track data is used for threat evaluation including target priority, followed immediately by target assignment for the tracking radar and weapon. Continuous search while engaging a target allows fast reaction against

subsequent targets.

The I/K-band monopulse tracking radar has a 1m diameter Cassegrain antenna and a CCIR Type B standard TV camera. The pencil-like K-band beam is used to provide accurate and continuous tracking data on sea-skimming targets. Tracking can be maintained in the most demanding environment, by automatic, sustained comparison of the signal-to-noise ratios of the two beams' returns.

Total reaction time against a sea-skimming supersonic anti-ship missile, which includes detection, identification, 90deg tracker/gun slew, tracker/gun elevation, and lock on is less than five seconds, with rounds intercepting the target at 1.5 kms. This 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. Automatic calibration and closed-loop correction of the point of impact are used to compensate for bias type errors, including inaccurate ballistic data.

The other system used by the class for anti-missile and anti-aircraft defence is the Mk-31 Guided Missile Weapon System RAM (rolling Airframe Missile). The system consists of the missile, a 21-cell Mk-49 launcher, below-deck electronics including launcher control interface and launcher servo control units, and a weapon control panel in the ship combat direction/combat information centre.

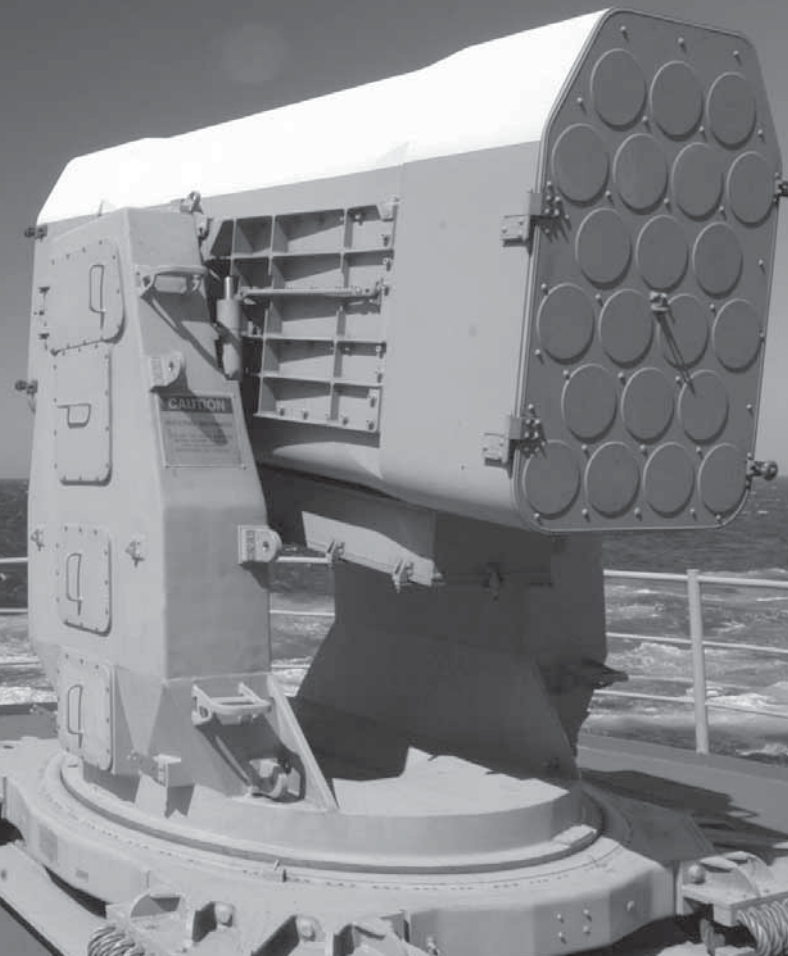
The RIM-116A (Block 0) missile is based upon the Sidewinder air-to-air missile but with significant modifications. It is a slim cylinder with two movable delta wings and four, folding, truncated delta fins which keep the missile spinning after it leaves the rifling of the launch tube. In the nose are two RF antennas and a rosette scan infra-red seeker for terminal guidance, the same as that used by the Stinger man-portable surface-to-

A USN LCAC landing craft about to enter the well dock of DOKDO during compatibility trials with the USMC. The LCAC was found to be able to operate from DOKDO, providing a measure of interoperability with the US for future amphibious operations. (USN)

A 30mm Goalkeeper CIWS during firing. DOKDO has two Goalkeepers each facing fore and aft.



A 21-cell Mk-49 RAM launcher. DOKDO has one Mk-49 system mounted above the bridge giving it a very large arc of fire for anti-ship missile defence. (USN)



air missile. Behind this is a new dual-mode passive radar seeker for mid-course guidance. It has a 9kg warhead and a laser proximity fuse. The missile is capable of 20g manoeuvres and has a range of approximately 10kms at Mach 2.

A single Mk-49 launcher is mounted above DOKDO's bridge and consists of a 21-cell missile launcher, largely made of GRP material, installed on a Phalanx mounting which retains the elevation and train drive assemblies. It is a bolt-on mounting with an above-deck weight of 5.2 tonnes (loaded).

Targets are designated by shipboard electronic or electro-optical sensors and this data is transferred to the RAM system through the External Designation System (EDS) which uses it to turn the launcher in the target's direction and to elevate it to the correct angle for efficient interception. Radar and electro-optical sensors provide details of target location, distance and speed while the ESM system inputs data on the target's radar frequency as well as correlating radar data on location. The missile motor is initiated and as it drives the missile along the firing cell, a rifling band ensures that it spins for effective guidance as it emerges from the launcher.

As the missile leaves the launcher the fins and tail surfaces emerge while the autopilot and control system maintain its line of sight course towards the target. The I/J-Band radar seeker, with its wide field of view, is activated and once this acquires the target it controls the guidance system which can make the appropriate course alterations. Once the radar seeker has acquired the target and turned the missile towards it, the IR seeker is activated and when a sufficient signal-to-noise ratio is achieved, this takes over guidance control for the terminal phase using proportional navigation.

Some 200 RAM systems have been delivered to the navies of Germany, Portugal, Greece, UAE, US and of course South Korea.

With no anti-submarine or anti-surface warfare capabilities DOKDO's

DOKDO pictured at the recent Defence Exhibition at Langkawi in Malaysia. The South Korean's brought her to the show in the hope of securing export orders. Malaysia is thought to be a potential customer. (Chris Sattler)



protection will be placed with her escorts. However, the inherent flexibility in a large flat decked ship means that she could embark both Anti-Submarine and/or Attack Helicopters to assist the escorts in dealing with such threats.

POWER PLANT

DOKDO is powered by four Doosan Heavy Industries/MAN SA PC2.5 STC medium speed diesel engines mounted on resilient mountings. Driving two variable pitch propellers, they move the ship at speeds up to 22 knots. Her range at 12kts is 10,000nm. DOKDO is also equipped with Bow thrusters which assist the ship at low speed and in harbour manoeuvring.

AMPHIBIOUS OPERATIONS

DOKDO can carry up to 720 Troops for short to medium durations. They are embarked in basic conditions onboard, but still have a high standard separate mess area. With the ship built for their use, the passageways, hatches, and stairwells are big enough to allow fully kitted troops free and easy movement from their accommodations onboard, to the troop embarkation areas at the well deck at the stern of the ship, and/or the flight deck.

The ship can carry 10 main battle tanks and 31 armoured vehicles or 35 trucks, but if necessary, the hangar can be used to increase the vehicle capacity to 70 tanks or 200 trucks.

DOKDO has a large well deck (floodable dock) that can operate either two USN LCACs (large hovercraft), four LCM-8 or six LCU Mk-10 landing craft at a time.

The LCM-8 landing craft can carry 57 tons at 9.2 knots. The LCU Mk-10 landing craft can carry 30 tons at 11 knots. With the well deck DOKDO can wait offshore and launch her landing craft within sight of the beach

but in deep water, allowing her freedom to manoeuvre if attacked.

AIR OPERATIONS

With its large flight deck DOKDO can handle every type of helicopter currently serving in the South Korean Armed Forces. The ROK military principally uses the UH-60P Blackhawk battlefield helicopter from the ships. The ship's hangar capacity is 10 Blackhawks.

It is hoped that new helicopters in the medium category such as the MH-90/EH-101 will be purchased in the near future that are more suited to naval operations, such as with folding blades and marinisation of key components. The flight deck itself has five helicopter landing spots, two elevators, and is coated with a special urethane shield similar to the coating on the flight deck of US aircraft carriers. This coating is resistant to heat, allowing the possibility of VSTOL fixed wing aircraft operations.

CONCLUSION

ROKNS DOKDO is a massive upgrade of capabilities for the ROKN. From a military view, until DOKDO and her sister ships receive (at the very least) a full complement of helicopters to use on the flight deck, DOKDO will not be used to her full potential.

Even at current capability DOKDO is a first class asset for the ROKN, and it now makes South Korea an even bigger player in the region's affairs.

DOKDO at sea. DOKDO is the lead ship of three very capable LPHs for the ROKN. (ROKN)



LCS MISSION TAKES SHAPE

FREEDOM Commissions, INDEPENDENCE

readies for sea trials^(*)

By Richard R. Burgess

The US Navy is currently taking some big steps towards its Littoral Combat Ship (LCS) capability with the first ship, FREEDOM, already on sea trials and the second, INDEPENDENCE, due to enter testing shortly. The ships represent a somewhat transformational capability compared to other more traditional USN ship designs. They will provide the principle combat interface between the blue and brown water areas of operation. Richard Burgess, managing Editor of the US Navy League magazine SEAPOWER takes up the story.

The US Navy, on Nov. 8, commissioned its first Littoral Combat Ship (LCS), FREEDOM, beginning an intensive evaluation period in which the LCS will be tested with three tailor-made mission packages — for mine countermeasures (MCM), surface warfare and antisubmarine warfare (ASW) — that will define its roles in the US fleet.

FREEDOM, built by a team led by Lockheed Martin, was commissioned in ceremonies in Milwaukee. The second LCS, INDEPENDENCE, a trimaran design built by a team led by General Dynamics (and including Australian company Austal), was launched at the Austal USA shipyard in Mobile, Alabama, on April 29 and is scheduled for sea trials during the southern hemisphere summer. Each of the ships will be evaluated beginning in 2009 with the mission packages.

FREEDOM and INDEPENDENCE will be manned with two 40-person crews — Blue and Gold — that will alternate taking the ships to sea, enabling the US Navy to maximise their time deployed.

The US Navy has a lot riding on the high-speed LCS, particularly

the service's goal of reaching an overall fleet size of 313 or more warships, of which 55 are intended to be LCS'. As of early September, the US fleet numbered 281 deployable ships.

The LCS is expected to support aspects of the US Navy and US Marine Corps' maritime strategy, especially ensuring access in the littoral waters for US maritime forces and maritime security engagement with foreign forces.

FREEDOM and INDEPENDENCE will be compared by the US Navy, but the course of action in selecting one or both designs for serial production has yet to be finalised. In April 2007, Secretary of the US Navy Donald C. Winter said that a single design would be selected in 2010, but left the option open to build both designs for a mixed fleet of Freedom - and Independence-class ships.

The intended second ships of each class, LCS-3 and LCS-4, respectively, were cancelled last year before keels were laid when the programme faced cost overruns and some funds intended for

FREEDOM on sea trials in Lake Michigan. (USN)



the later ships were diverted to cover the first two. The US Navy will not reissue those hull numbers, said Alan Baribeau, a spokesman for the US Navy's programme executive officer for ships.

The US Navy has yet to issue a contract for LCS-5, even though it was authorised and funded in the fiscal 2008 budget. It likely will award the contract shortly along with contracts for LCS-6 and 7, which are expected to be approved in the 2009 budget.

The odd number of ships indicates a scenario in which one industry team will build two new ships and the other left with one, although the competition provisions do not rule out one industry team winning all three.

The 3,100-ton, 378-foot-long FREEDOM was put through builder's trials on Lake Michigan that began July 28, 2008.

Fred Moosally, president of Lockheed Martin Maritime Systems and Sensors, was pleased

with the results of the trials. He praised the "breakthrough" combined diesel and gas turbine propulsion plant, which featured the largest marine gas turbine engine in the world, the Rolls-Royce MT30.

"The ship has got absolute and incredible responsiveness and power," he said. "This ship also has an unprecedented degree of automation."

Moosally, a former ship skipper, said FREEDOM exceeded 40 knots for sustained periods several times during the sea trials, impressive for a warship of its size, calling it a "race car at sea." The ship conducted 180- and 360-degree turns at full power.

"It handles like a dream at both high and low speeds," he said. "I've never seen a ship respond that quickly to the changes in the throttling system."

Moosally expects FREEDOM will be slightly faster when it reaches the ocean, because salt water provides more buoyancy. FREEDOM, constructed at Manitowoc's Marinette Marine shipyard in Marinette, Wisconsin, is built on a semi-planing monohull, which at high speeds skims over the water rather than simply ploughing through it.

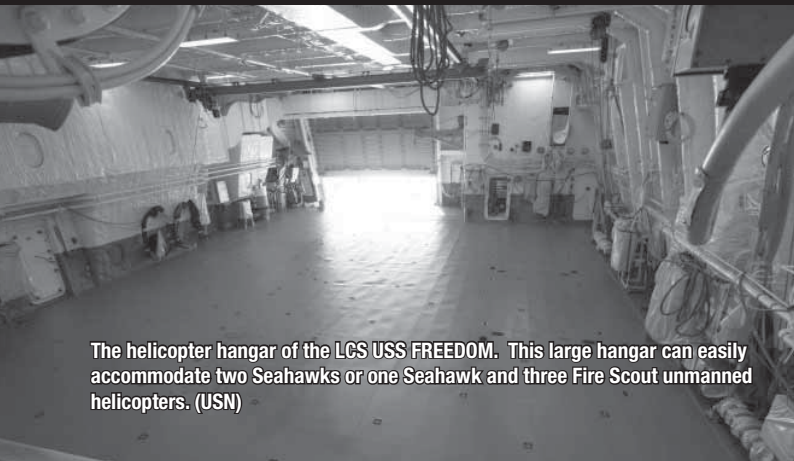
With a crew of only 40 Sailors, not including the 35 to 38 Sailors embarked with a mission package and aviation detachment, automation is essential to the operation of an LCS. One of the main activities of the builder's trials was to fine-tune that automation. FREEDOM, for example, does not have bow thrusters, but has a manoeuvring mode called harbour moving



A Mk-38 25mm rapid fire gun in operation. On the LCS's surface warfare package two guns can be quickly installed in modules on the ship's superstructure. (USN)

FREEDOM at high speed on Lake Michigan. She achieved over 40kts in the fresh water and is expected to go much faster in salt given salt water provides more buoyancy. (USN)





The helicopter hangar of the LCS USS FREEDOM. This large hangar can easily accommodate two Seahawks or one Seahawk and three Fire Scout unmanned helicopters. (USN)

that “allows sideway motions to moor without tugs,” Moosally said.

During the 11-day trials, the ship’s Mk-110 57mm gun, RIM-116 Rolling Airframe Missile launcher, TRS-3D radar and open-architecture combat system were exercised, though no firings were conducted because of treaty restrictions with Canada on the Great Lakes. Firings will be conducted after the ship arrives at Norfolk, Virginia.

FREEDOM’s flight deck is equipped with a Trigon aircraft-handling system, by which one person can move an SH-60 Seahawk helicopter from the flight deck into the ship’s hangar. The mission bay below the flight deck features an integrated cargo-handling system that can handle boats, unmanned underwater vehicles and other equipment of a mission package.

Both the stern ramp door and side door of the ship’s mission bay were tested. Some leaking of a seal in the stern ramp door was detected and fixed during the trials. Boat launches and recoveries on the stern ramp were not conducted, but launches of rigid-hull inflatable boats were conducted from the boat door in the port side.

Though no mission packages were onboard for sea trials, the mission bay and flight deck impressed observers with their sheer size. Moosally said the flight deck for the helicopters and unmanned aerial vehicles is larger than those of the fleet’s cruisers and destroyers.

The US Navy’s Board of Inspection and Survey put FREEDOM through acceptance trials in early September, with good news for Lockheed Martin’s team.

“LCS-1 performed extremely well during this operation,” said Capt. James Murdoch, the US Navy’s LCS programme manager. “There is much more work to be done, but we are very encouraged by the results we’ve seen so far.”

“The board found the ship to be capable, well built and inspection-ready,” Baribeau said. “The ship was presented to the board with high levels of completion in production and test. These levels of completion, coupled with good quality installations and excellent craftsmanship, resulted in relatively low numbers of material deficiencies as compared to other first-of-class warships.”

Baribeau was not at liberty to release specific findings of the board.

MISSION PACKAGES

The US Navy introduced the ASW mission package on Sept. 19 at Point Mugu, California, making one of each package type available for testing by the LCS. The surface warfare package was rolled out at Dahlgren, Virginia, July 11, and the first MCM package was presented in 2007.

A second surface warfare package is being produced, and the US Navy has proposed procurement of two MCM and one surface warfare package in 2009, a fourth surface warfare package in 2010 and the second ASW package in 2011. A total of 64 packages are planned for the US Navy

— 24 MCM, 24 surface warfare and 16 ASW.

The three types of packages have some elements in common, such as the MQ-8B Fire Scout vertical-takeoff unmanned aerial vehicle, which first flew with its Brite Star II electro-optical/infrared sensor and Tactical Common Data Link on 9 August.

The WLD-1 Remote Multimission Vehicle, an unmanned surface vehicle that operates just under the surface with an exposed mast, is equipped with MCM systems and also can tow acoustic arrays for the ASW package. The WLD-1 is under evaluation on an Arleigh Burke-class destroyer.

The MH-60R helicopter supports the surface warfare and ASW missions with its sensors, torpedoes and missiles, while the MH-60S version can carry five different MCM systems.

The surface warfare package includes the Mk-50 30mm rapid-fire gun, two of which can be quickly installed in modules of the ship’s superstructure. The Non-Line-of-Sight Missile Launch System also can be inserted on the ship, enabling the LCS to fire the Precision Attack Missile against fast-maneuvring boats, among other targets.

The ASW package also includes, among other systems, an unmanned surface vehicle — a rigid-hull inflatable boat — to tow an acoustic source, passive acoustic array and a dipping sonar for detection of submarines.

Each mission package will be manned by a detachment of 15 Sailors, who will report to the LCS Class Squadron in San Diego. The aviation detachments from helicopter squadrons will be manned by 23 personnel.

The mission systems and support container packages are designed to be transportable by truck, cargo aircraft, rail car or sealift, according to Baribeau, for staging to ports for swap-out.

Surface warfare mission package engineering testing on FREEDOM is scheduled for late 2009, followed by ASW engineering testing in 2010. MCM developmental testing and operational assessment and surface warfare and ASW development testing are scheduled for 2010 through early 2011.

Operational testing for all three mission packages will start in 2011, continuing into 2012, Baribeau said. For INDEPENDENCE, ASW mission package engineering testing is scheduled for late 2009, followed by surface warfare engineering testing in 2010.

Moosally is concerned about the delay in contract awards for the LCS and the detrimental effects it may have on the work force at the Marinette Marine shipyard. Bollinger Shipyards Inc. in Lockport, Louisiana also remains part of Lockheed Martin’s plan for production of the LCS.

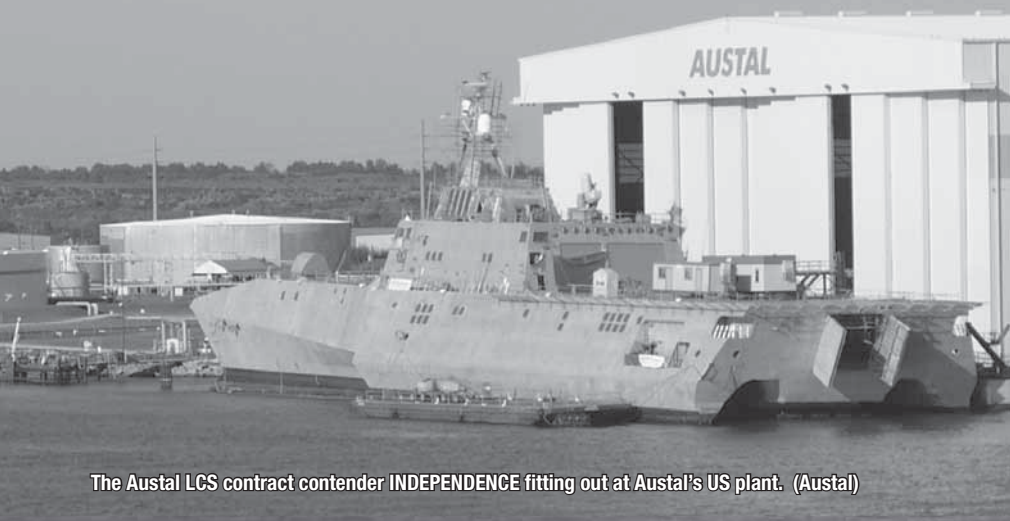
“We need another contract soon,” he said. “The LCS contracts will be fixed-price and [do] not even allow for inflation. This is where you start running into issues.”

The 2009 US Defence budget currently being legislated by Congress may provide some relief for inflation. Congress previously set a cost cap of \$460 million per ship.

Moosally was upbeat with the announced acquisition of Manitowoc Marine Group by Fincantieri, Trieste, Italy, one of the world’s biggest shipbuilders. Fincantieri is expected to invest \$100 million in the Marinette Marine shipyard, a subsidiary of Manitowoc.

Regarding potential international sales, Lockheed Martin is studying how to adapt its LCS design for the Israeli Navy and the combat system that such a ship would require. Lockheed Martin also is in discussions with Saudi Arabia about the LCS replacing 12 ships in the kingdom’s eastern fleet.

(*) Reprinted from *Seapower Magazine*, the official publication of the Navy League of the United States.



The Austal LCS contract contender INDEPENDENCE fitting out at Austal's US plant. (Austal)

AN/WLD-1 REMOTE MINEHUNTING SYSTEM

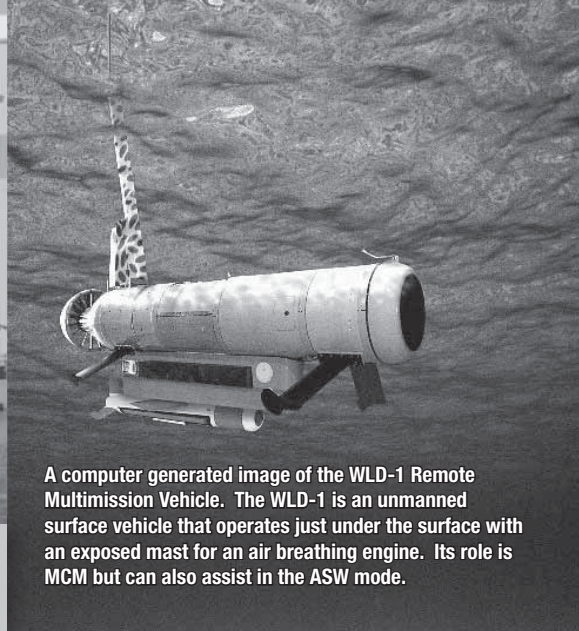
The ship-based AN/WLD-1 Remote Minehunting System relies on a diesel-powered, remote minehunting system designed to be integrated on six US Navy DDG-51 Flight IIA class destroyers and the Littoral Combat Ship (LCS). It will operate without impacting other warfare missions being fully integrated with the AN/SQQ-89(V)15 underwater warfare system.

The AN/WLD-1 consists of an unmanned semi-submersible remote minehunting vehicle, called the Remote Multi-Mission Vehicle (RMMV), which tows a powerful variable depth sensor to detect, localise, identify and classify moored and bottom mines. It will be launched and controlled remotely by forward deployed ships, giving to carrier strike groups an over-the-horizon mine reconnaissance capability in a safer way for both crew and ship.

The AN/WLD-1 RMS (Remote Minehunting System) was developed by Lockheed-Martin to operate in littoral regions as well, aiding warships to effectively detect and avoid mine threats.

On August 28, 2004, the USS MOMSEN destroyer became the first US Navy surface ship to be equipped with organic mine reconnaissance capability using an unmanned, remotely operated vehicle.

The US Navy plans call for deployment of the AN/WLD-1 onboard DDG-91 through DDG-96 Arleigh Burke-class destroyers and the Littoral Combat Ship (LCS). In late September 2006 Lockheed Martin was awarded a \$34 million contract for four low-rate initial production WLD-1 Remote Minehunting Vehicles (RMVs) to be delivered before October 2008.



A computer generated image of the WLD-1 Remote Multimission Vehicle. The WLD-1 is an unmanned surface vehicle that operates just under the surface with an exposed mast for an air breathing engine. Its role is MCM but can also assist in the ASW mode.

A Northrop Grumman MQ-8B Fire Scout vertical-takeoff unmanned aerial vehicle photographed recently on the flight deck of USS FREEDOM, minus its rotor blades. (USN)



FREEDOM on sea trials. The ship's builder, Lockheed Martin, are also trying to sell the ship to Israel and Saudi Arabia. (USN)





01 DEFENCE ACCEPTS UPGRADED FFGs

The Minister for Defence, the Hon. Joel Fitzgibbon MP, has announced that the Defence Materiel Organisation (DMO) has agreed to 'Contractual Acceptance' from the prime contractor, Thales Australia, of two upgraded guided missile frigates, HMA Ships SYDNEY and DARWIN.

"Upon coming to office a year ago, the Adelaide class frigate upgrade programme was one of several projects we had inherited from the previous Government, which had serious difficulties, running over four years behind schedule, and a \$150 million over budget," Mr Fitzgibbon said.

"We have now managed a significant milestone in this programme, and come one step closer to having these ships on operational activities."

Mr Fitzgibbon said continued collaboration between DMO and Thales Australia has resulted in much improved progress with trials, delivery and support for the upgraded ship systems.

Upgraded software for the Australian Distributed Architecture Combat System has now been delivered. The Acceptance milestone also includes the new FFG Warfare Systems Support Centre at Garden Island.

Contractual acceptance of HMAS MELBOURNE is expected by the end of the year, and provisional acceptance of the fourth FFG to be upgraded, HMAS NEWCASTLE, is now expected by June 2009.

How such a turn around has been achieved has not been explained properly when one considers the damning report of the Australian National Audit Office on the project. In particular the issues surrounding the C-PEARL ESM system.

NAVY AND MARITIME QUALIFICATIONS MERGE

Minister for Infrastructure and Transport, Anthony Albanese, and Minister for Defence, Science and Personnel, Warren Snowdon, have announced a landmark agreement which will enable easier transfer between the civilian and military life at sea.

The Australian Maritime Safety Authority and the RAN

have agreed to recognise equivalent qualifications, providing a wider range of career opportunities for both RAN Seaman officers and their civilian counterparts.

"With appropriate bridging courses, naval officers are now able to obtain the competencies required for certification to master civilian vessels – an important outcome at a time when the local maritime industry is facing the challenges of an ageing workforce," Mr Albanese said.

"Conversely, the qualifications of civilian mariners would be more easily recognised by Navy, providing career opportunities in the service of their country."

Mr Snowdon said mutual recognition of qualifications has long been raised as an issue within Navy.

"Navy provides excellent training opportunities and experience, which would serve a sailor well in any maritime career," Mr Snowdon said. "This initiative not only enhances the desirability of being a RAN Seaman officer, but it potentially creates a greater pool of mariners who may like to sample life on a patrol boat or frigate, even as reservists."

The agreement enables joint recognition of the qualifications gained by RAN Seaman Officers towards an internationally recognised certificate of competency issued under the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, As Amended (STCW).

It recognises the RAN's commitment to high training standards and outlines the training pathway that Naval officers are able to undertake in order to gain AMSA issued STCW civilian qualifications.

AWD UPDATE

The Air Warfare Destroyer (AWD) Alliance announced in December that it had signed contracts for the provision of a further three elements of the AWD's Hobart class combat system.

The AWD Alliance is made up of the Defence Materiel Organisation, ASC and Raytheon Australia. The first of three AWDs is scheduled for delivery in 2014.

The AWD Alliance's CEO, John Gallacher said the latest contract signings demonstrated that the \$8

billion project was on schedule and on budget.

In the past month the AWD Alliance has signed contracts totalling about \$20m for the provision of:

- an Infra Red Search and Track capability (\$10m)
- a Counter Measure capability (\$5m)
- Navigation Radar (\$3m)

These follow contracts entered into earlier this year for an Australian Tactical Interface Phase One (\$4m), the ships' sonar capability (\$85m) and the ships' MK 45 5" gun (\$80m).

Mr Gallacher said the Alliance aimed to complete a number of other combat system procurements by the end of the year including the harpoon weapon launcher and control system, the very short range 25mm gun defence capability, the torpedo launch system and tubes and satellite communications antennas.

DNA TESTS FAIL TO IDENTIFY SYDNEY II SURVIVOR

Recent DNA testing of samples taken from a number of relatives of the crew of HMAS SYDNEY II have failed to identify the remains of the unknown sailor. The sailor's remains were exhumed from Christmas Island in October 2006.

Although the remains have not as yet been identified, they are believed to be those of a crew member of HMAS SYDNEY II, which was sunk off the West Australian Coast on 19 November 1941 following enemy action. All 645 crew from HMAS SYDNEY II perished.

While an official reinterment and memorial service for the Unknown Sailor was held in Geraldton on 19 November 2008, the case is by no means closed.

DNA testing conducted by the Australia Centre for Ancient DNA located in Adelaide has excluded 15 crew members short listed following a thorough and methodical forensic and historical investigation in an attempt to identify the remains.

Family of HMAS SYDNEY II crew members who wish to be considered for DNA testing and comparison against the remains of the Unknown Sailor are asked to make contact with the Christmas Island

01 HMAS SYDNEY leaving Sydney Harbour for sea trials of her troublesome upgrade package. (Chris Sattler)



Investigation Team by letter to:
Director Navy Ministerials & Coordination,
R1-4-C070
Department of Defence
Russell Offices
Canberra, ACT, 2600.

02 CEA FAR RADAR ACHIEVES SEA DEMONSTRATION MILESTONE

The Anzac ASMD Upgrade Project successfully demonstrated the CEA FAR active phased array multi-function radar installed on an Anzac frigate, HMAS PERTH off the coast of Western Australia.

CEAFAR is one of the most advanced maritime multifunction radar systems in production. Being a fully digital beam forming system, it can dynamically adapt and change modes to meet complex environmental and threat scenarios. Its scalability is enabled by the tile based face architecture and the digital beam forming backend.

The risk reduction and data collection objectives of the at-sea demonstration were successfully achieved in significantly less than the planned time frame. This enabled additional capabilities to be assessed during the sea going opportunity.

Activities included tactical air and surface scenarios involving multiple aircraft and ships, small targets representative of anti-ship missiles and weapon systems. These were conducted in littoral and open ocean maritime conditions and included the complex electromagnetic environments associated with multiple warships and aircraft.

The at-sea demonstration followed a successful land-based demonstration of the same production hardware at CEA's Canberra facilities on the 6th of November. The faces used in the demonstration were from the first production run and had been delivered on schedule from the company's production line in July 08. This same dual faced configuration was then transported by road from Canberra to the RAN's Fleet Base West (FBW), Western Australia for the installation process; arriving just 4 days before the planned sailing time.

The system was declared operationally ready for the at-sea period just three and a half days after its arrival at FBW."

The simplicity of its architecture and construction enabled the at-sea demonstration to be conducted in the very short timeframe, which was achieved by the combined resources of the Anzac ASMD Project team, HMAS PERTH, the Anzac Ship Alliance and CEA staff.

"This early at sea demonstration of the CEA FAR capability is part of an overall Commonwealth strategy of advance demonstration of the system before installation into the first ship. The radar performed beyond expectations and the success of the sea trial now represents a very significant risk reduction step for the whole programme." concluded CEA's Technical Director Ian Croser.

The ASMD Upgrade Project will ensure the RANs Anzac frigates have an enhanced level of self defence against modern anti-ship missiles. It will also improve the Anzac frigates ability to provide close-in protection to an amphibious maritime task group, supporting the RANs future Air Warfare Destroyer area air defence capability.

03 AUSTAL AWARDED US DEFENCE JHSV CONTRACT

Austal has won the contract to design and build the US Department of Defense's next generation multi-use platform, the Joint High Speed Vessel (JHSV), as part of a programme potentially worth over US\$1.6 billion.

As Prime contractor, Austal will design and construct the first 103-metre JHSV, with options for nine additional vessels expected to be exercised between FY09 and FY13.

Similar to the Austal-built *WestPac Express* operated by the US Marines for the past seven years, the JHSV will be capable of transporting troops and their equipment, supporting humanitarian relief efforts, operating in shallow waters and reaching speeds in excess of 35 knots fully loaded. The vessels will be a joint-use platform operated by both the United States Army and Navy.

Austal Managing Director Bob Browning said, "Being selected as Prime contractor for a major US Department of Defence shipbuilding programme demonstrates Austal's capabilities as a defence supplier. Austal is very proud to have been selected to build an important part of the US Navy's fleet. This 10 vessel programme is an important step in Austal's strategy to create longer-term, more predictable earnings for our investors."

The vessels will be built at Austal's US shipyard located in Mobile, Alabama, where work is continuing on the first phase of a new state-of-the-art Modular Manufacturing Facility (MMF). Upon completion in mid-2009, the first half of the 70,000 m2 MMF will be available for the fabrication of all JHSV modules. Austal USA's 1000-strong workforce, which is currently completing the US Navy's 127 metre Littoral Combat Ship INDEPENDENCE (LCS-2), as well as a 113 metre high speed catamaran for Hawaii Superferry, will grow to more than 1500 as a result of the JHSV programme.

"As demonstrated by the two Hawaii Superferry vessels recently constructed at our Mobile, Alabama facilities, our US shipyard has the capability to deliver large high speed advanced aluminium platforms on time and on budget - a capability which will be further enhanced upon completion of the MMF and the expansion of our US workforce," Mr Browning said.

Sea trials of the recently-christened INDEPENDENCE (LCS-2) are scheduled to commence this year. Mr Browning said the US Navy's ongoing commitment to a 55-vessel LCS programme, as part of its 313 ship fleet, meant there was strong chance Austal would be awarded a second LCS in early 2009.

Austal Chairman John Rothwell said successfully bidding as Prime contractor for the JHSV programme was a fantastic result for the company, which had taken significant steps towards advancing its standing as a defence supplier.

Austal is teamed with General Dynamics Advanced Information Systems, who will design, integrate, and test the JHSV's electronic systems, including an Open Architecture Computing Infrastructure, internal and external communications, electronic navigation,



02 The dual face CEA FAR radar configuration as fitted to HMAS PERTH for the at sea demonstration. (CEA)



03 A computer generated image of Austal's Joint High Speed Vessel (JHSV) for the US Military. (Austal)



aviation, and armament systems.

04 RUSSIA COULD ORDER AIRCRAFT CARRIERS FROM UKRAINE

Moscow is considering an offer to the Ukraine to build aircraft carriers for the Russian Navy.

Russian Defence Minister Anatoly Serdyukov's said on 24 Sept that Russia may make several lucrative proposals to Ukraine which may also convince Kiev to allow Russia's Black Sea Fleet to remain in Sevastopol after 2017, when the lease on the naval base in the Crimea expires. Ukraine was 'upset' with Russia over the Black Sea Fleet's involvement in the attack on Georgia, another break away republic of the former Soviet empire (see *From the Crow's Nest* in this edition)

"We can offer Ukraine extensive and lucrative opportunities in the sphere of shipbuilding. They have the Nikolaev shipyards that used to build aircraft carriers during Soviet times," said Vyacheslav Popov, a former commander of the Northern Fleet who now sits in the Russian upper house of parliament.

"These shipyards are bankrupt and abandoned at present and with mutual consent we could help reactivate them," Popov said.

Russia currently lacks the capacity to build aircraft carriers and modernising its existing shipyards would be an expensive and lengthy proposition.

Popov said though that this proposal "may become a sensitive issue" as Ukraine's pro-Western president, Viktor Yushchenko, is seeking NATO and EU membership for the country.

Yushchenko has called for the Russian Navy's early withdrawal from the Sevastopol base, as well as tougher deployment requirements and higher fees.

Ukraine's Foreign Ministry said later that Ukrainian and Russian delegations would meet in Kiev for a new round of discussions on the operation of the base in the context of the Georgia conflict.

"During the consultations Ukraine will set out its position on the Black Sea Fleet's action during crisis situations," the ministry said.

Russia's naval base in the Crimea currently has 50

warships and patrol boats, along with around 80 aircraft, and employs coastal defence troops.

05 NAVANTIA CUTS STEEL FOR CANBERRA

Navantia's Fene-Ferrol shipyard in Spain has officially started the construction of the first of two Canberra class LHDs for Australia, cutting the steel for two blocks, one at 1.87 tones and the other at 3.5 tones.

The two LHD's, are very similar to the Spanish LHD JUAN CARLOS I built by Navantia for the Spanish Navy.

Minister for Defence The Hon. Joel Fitzgibbon recently visited the shipyard and toured JUAN CARLOS I being built.

06 STENNIS PUTS GROWLERS TO THE TEST

The USN's EA-18G Growler is being tested for the first time in an integrated operational environment aboard the aircraft carrier USS JOHN C. STENNIS (CVN-74) by Air Test and Evaluation Squadron (VX) 9 as part of Operation Evaluation (OPEVAL).

The Growler is an electronic attack aircraft, using the same airframe as the F/A-18F Super Hornet. It's scheduled to replace the EA-6B Prowler in Spring 2009 and continue the electronic attack mission in carrier strike groups.

"This carrier test is part of a large test matrix that we have for the airplane. Basically, it's the final exam for the aircraft," said VX-9 Electronic Warfare Branch Head Cmdr. Al Bradford.

Squadron pilots will fly during night carrier operations for the first time as they test the Growler's overall practical operability on the flight deck.

"During the tests, VX-9 will evaluate how the aircraft and its electronic attack components hold up during carrier landings," said Mike Dobelman, Boeing field service representative.

STENNIS' flight deck crew is providing feedback as they work with the new aircraft to help VX-9 evaluate

handling the Growler.

One concern the squadron is seeking feedback on is the difficulty of identifying similar aircraft.

Air Department Mini Boss Brice Lund noted that the jamming pods located on the wings of the Growler is one way to prevent miss-identification from arising during flight deck operations.

However, using the same airframe as the F/A-18F gives the Growler many advantages over its predecessor.

Growlers fly with a two-man crew where the Prowler needs a crew of four.

"The Growler crew is able to do the same mission with half as many people because the airplane has a lot of automated features that the Prowler does not," said Bradford. "Navigation, communications and the entire crew-vehicle interface is much more automated."

Replacing the aging Prowlers will also cut down on the amount of maintenance squadron Sailors must perform.

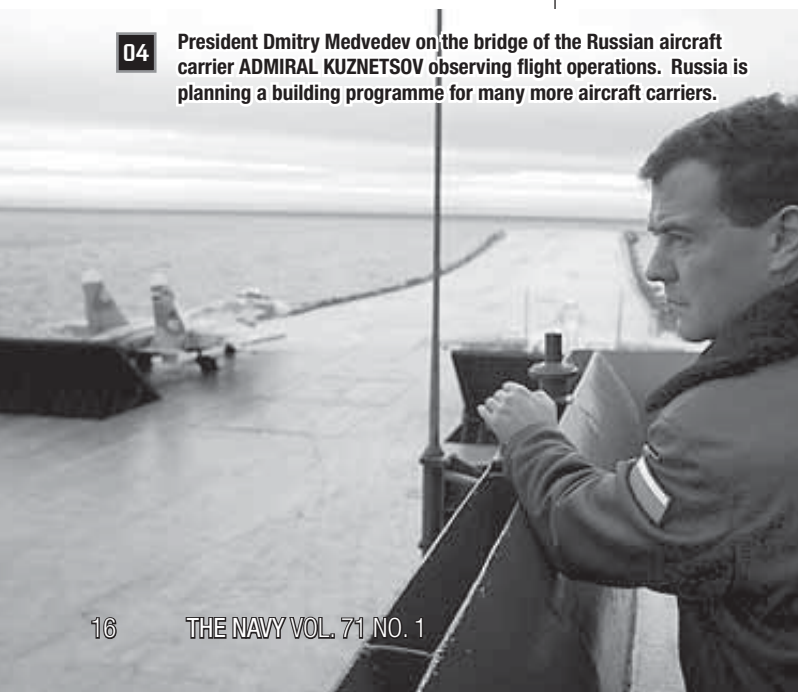
Changing the engine on an EA-6B Prowler requires about two days of work. Changing the engine on the EA-18G Growler only takes about two to three hours.

Growlers also reduce the work load on the flight deck. "The Prowlers can't start on their own," said Aircraft Handling Officer Lt. Eric Harrington. "They need to get assisted power, so that means more ground support up here. Having the Growlers up here does away with that, because now they can start on their own. That'll minimise the amount of equipment and personnel that have to support that aircraft."

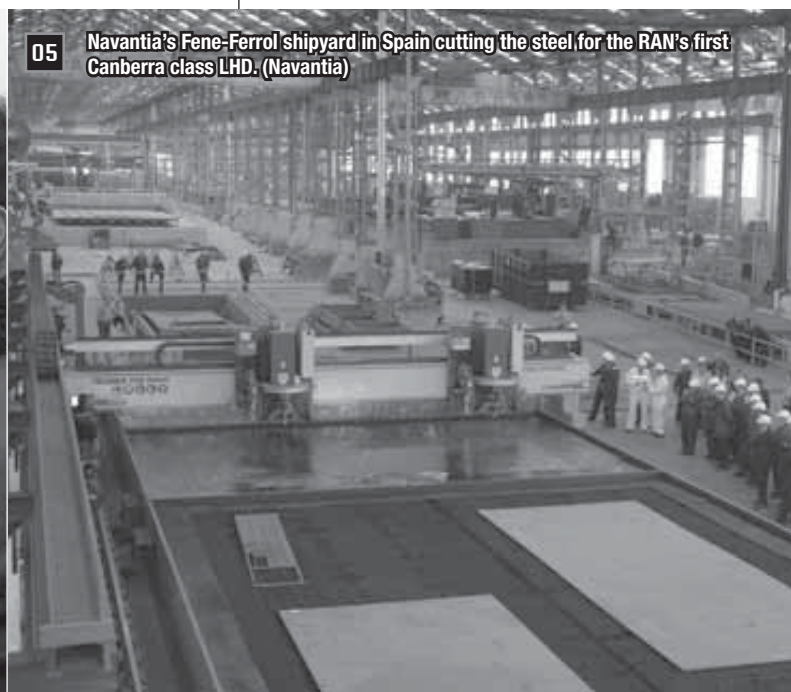
Having the Super Hornet's airframe not only makes improvements in operability, but adds new tactical elements, such as self-defence to the electronic attack mission.

On Aug. 5 2008, the AGM-88 High-Speed Anti-Radiation Missile (HARM) test was conducted on the Growler at NAWCWD, China Lake. The air-to-surface tactical missile is designed to seek and destroy enemy radar-equipped air defence systems. The AGM-88 can detect, attack and destroy a target

04 President Dmitry Medvedev on the bridge of the Russian aircraft carrier ADMIRAL KUZNETSOV observing flight operations. Russia is planning a building programme for many more aircraft carriers.



05 Navantia's Fene-Ferrol shipyard in Spain cutting the steel for the RAN's first Canberra class LHD. (Navantia)



with minimum aircrew input. Guidance is provided through reception of signals emitted from ground-based threat radar.

"The successful HARM shot is another milestone accomplishment on the road to the EA-18G joining our carrier air wings. It demonstrates a key offensive capability of the Growler weapon system," said Cmdr. Francis Morley, NAVAIR's EA-18G programme manager.

RAYTHEON TO DELIVER ZUMWALT'S DUAL BAND RADAR TO CVN-78

US company Raytheon has received a USD\$23.5 million USN contract to adapt the Dual Band Radar (DBR) developed for the Zumwalt-class destroyer for installation on the future USS GERALD R. FORD (CVN-78), America's next-generation aircraft carrier.

Raytheon will deliver DBR supporting equipment hardware and software designs to meet the installation and integration requirements of the CVN-78 class of ships.

Leveraging proven technologies to meet the carrier mission requirements in both deep water and littoral environments, DBR will be the USN's most capable radar and a critical asset for the fleet.

Raytheon's Dual Band Radar features X-band and S-band phased array radar faces, which operate together in a complementary manner.

FINCANTIERI TO BUILD NEW TANKER FOR INDIAN NAVY

Italian shipbuilder Fincantieri has announced the company has gained an order to build a fleet tanker for the Indian Navy.

Following previous orders to Russian industries, this is the first order for a surface vessel for which India has chosen a foreign company, Fincantieri, which competed to win the order against leading international players, especially from Russia and Korea.

The vessel, which will be built at the shipyards in Liguria, for delivery at the end of 2010, will be 175 metres long, 25 wide and 19 high and will have a

displacement at full load of 27,500 tonnes. The ship will be powered by two 10,000 kW diesel engines which will enable it to reach a maximum speed of 20 knots and its propulsion system will feature an adjustable blade propeller. There will also be a flight deck on board for medium-heavy helicopters (up to 10 tons).

The ship will accommodate up to 248 passengers – crew and supplementary personnel.

Equipped with double hatches, the vessel will be able to service four ships at the same time.

In accordance with the new Marpol regulations of the International Maritime Organization concerning the protection of the environment, this will be the first ship of this type to be built with a double hull thereby improving protection of the fuel tanks and avoiding the risk of pollution in case of collision or damage.

Fincantieri has already built the *Sagar Nidhi* for India, an oceanographic vessel for the National Institute of Ocean Technology (NIOT) in Madras which was delivered at the end of 2007. In addition, in 2004 the company drew up two contracts with Cochin shipyard regarding the design of the engine, technology transfer and the provision of complementary services for the construction of the Air Defence Ship (ADS); activities are also in the process of being finalised for the sharing of the functional design and details of the propulsion system. The assistance stage at the Indian shipyard is about to start up shortly.

In order to better service the Indian area, Fincantieri has set up a permanent, representative office in New Delhi.

FITTING OUT OF SECOND FRIGATE FOR PN STARTS IN CHINA

The fitting out of the second F22P frigate for the Pakistani Navy has started at Hudong Zhonghua Shipyard, Shanghai.

The ship will be named PNS SHAMSHEER when it joins the Pakistani Navy in January 2010.

In October 2005, The Pakistani Ministry of Defence signed a contract with China Shipbuilding and Trading Company (CSTC) for construction of four F22P frigates for the Navy with Transfer of Technology

(TOT). Three ships are to be built in China and the fourth ship will be constructed at Karachi shipyard.

Currently, the first ship (to be named PNS ZULFIQUAR) is under sea trials and due to be delivered to the Pakistan Navy by the end of July 2009. Construction of third Ship (to be named PNS SAIF) is also progressing at a fast pace.

UK DEFENCE CONTRACT AWARDED TO AUSTRALIAN COMPANY

Liferaft Systems Australia (LSA) has secured a contract worth approximately \$7 million to supply Marine Evacuation Systems to the UK Ministry of Defence for use on two new British aircraft carriers.

LSA European Manager Mr Peter Rea said it was the biggest single contract since the company was founded over 16 years ago.

"LSA has been working on finalising this contract for about 18 months after we were initially approached by the UK Aircraft Carrier Alliance who had noticed the design and quality of our product" he said. Under the contract, LSA will be providing 12 x 20 metre long inflatable evacuation slides (deployed from approximately 12 metres above sea level) and 60 x 100 person inflatable life rafts.

The life saving equipment, designed and manufactured in Hobart will be provided to UK Aircraft Carrier Alliance prior to the vessels being launched.

Mr Rea said while LSA had previously provided Marine Evacuation Systems to the French, Dutch, UK and USA navies, this was the first contract the company had received to supply their systems for installation on aircraft carriers.

The two new aircraft carriers, HMS QUEEN ELIZABETH and HMS PRINCE OF WALES, are similar in size and weight to the recently retired passenger liner QE2, with each having a flight deck area of nearly 13,000 square metres and hangar space of 29,000 square metres.

The aircraft carriers will be 280 meters long and 70 metres wide with capacity to carry 40 aircraft and nearly 1500 crew.

Mr Rea said he was obviously delighted to secure

06 A USN EA-18G Growler doing a touch and go from the carrier USS John C. Stennis (CVN-74) as part of the aircraft's Operation Evaluation. (USN)





such a major contract. "Our product, which can be deployed to evacuate significant numbers of crew or injured persons in just a few minutes has revolutionised marine evacuation procedures around the world" he said.

LSA, which exports 95% of its systems to customers around the world, has offices in UK and North America and provides service facilities in 22 countries. In addition to Marine Evacuation Systems, LSA has also developed other inflatable safety products for aviation and military use.

07 RUSSIAN WARSHIPS VISIT VENEZUELA

A task force from Russia's Northern Fleet led by the Kirov class cruiser PYOTR VELIKY visited Venezuela from November 24-30 2008.

The Northern Fleet task force also included the Udaloy class anti-submarine warfare ship ADMIRAL CHABANENKO.

The ships conducted a number of naval exercises with the Venezuelan navy and a number of goodwill port visits. One of the visits included hosting the Venezuelan President Hugo Chavez and Russian President Dmitry Medvedev.

The two countries have signed \$US4.4 billion in bilateral arms deals signed since 2005, including radars, 24 Sukhoi-30 fighters, 50 helicopters and 100,000 Kalashnikovs.

08 CH-148 CYCLONE COMPLETES FIRST FLIGHT

The first CH-148 Cyclone helicopter, which is being developed by Sikorsky Aircraft Corp. for the Canadian government as a replacement for its long-serving Sea King helicopter fleet, has completed its first flight successfully at Sikorsky's Development Flight Centre in Florida.

The flight occurred Saturday, Nov. 15 2008. The aircraft hovered and accomplished low-speed handling tasks including forward flight at speeds reaching 30 knots, and sideward and rearward manoeuvres. The helicopter, Tail No. 801, will

continue to undergo a series of increasingly demanding flight tests leading up to certification and production deliveries.

Sikorsky will build 28 CH-148 helicopters for the Canadian government

The CH-148 helicopter represents the next step in Sikorsky's long planned extension of the S-92(R) helicopter into the H-92(TM) helicopter product line. It is equipped with a fully digital, fly-by-wire system designed to improve significantly the aircraft's manoeuvrability, safety and effectiveness. The CH-148 helicopter builds upon Sikorsky's S-92 helicopter.

MORE PROBLEMS FOR RNZN

The RNZN's new offshore patrol vessels being built in Melbourne have been hit by fresh problems and 70 sailors on the ships have been sent home.

The vessels involved are the OTAGO and WELLINGTON.

Their crews, sent to Melbourne to man the ships and train on them, would not return until the ships were commissioned and ready to sail to New Zealand, the Otago Daily Times said in a front-page report.

The newspaper added the ships had serious weight issues jeopardizing future operations.

This problem and contract issues were likely to delay delivery of the ships for up to six months.

OTAGO was launched in November 2006 and was to have been commissioned in the second half of last year.

She was reported in September to be waiting in Melbourne for replacement rigid-hulled inflatable sea boats, ordered after problems emerged with those originally supplied for HMNZS CANTERBURY, the RNZN's 8000-tonne multi-role ship, and also intended for the patrol vessels.

OTAGO and WELLINGTON, the latter launched in October last year, are two of the seven ships to be built for the RNZN under the \$500 million Project Protector programme.

Both have undergone their sea trials but cannot be commissioned until the weight problem is resolved

and sea boats supplied.

The Otago Daily Times, quoting incoming NZ Minister of Defence Wayne Mapp, said that OTAGO was believed to be battling serious weight problems.

The patrol vessels were strengthened for ice-breaking purposes in the southern oceans but the resulting weight increase meant they were unable to sail in such waters.

Dr Mapp said he understood OTAGO was 100 tonnes overweight.

PASSING THE BUCK ON NERPA CONTINUES

The deaths of 20 people on board the Akula II class SSN Nerpa could have been caused by a computer glitch, not a crew member, a Russian daily reported in December.

The tragedy occurred late on November 8 while the Nerpa was undergoing sea trials in the Sea of Japan. Three submariners and 17 shipyard workers died in the accident. There were 208 people, 81 of them submariners, on board the vessel at the time.

"We submariners are unanimous: a computer programme failed. Previously, the submarine fire suppression system had always started manually on the commander's orders. Now it is launched electronically," Ensign Yevgeny Ovsyannikov, a technical specialist on the Nerpa, told the newspaper Komsomolskaya Pravda.

He added that it was the first time this computerised system had been used on the submarine during the sea trials and that the computer had malfunctioned during tests in the dock.

An expert who requested anonymity suggested that a toxic form of Freon could have been used in the fire suppression system.

"A toxic additive, trichlorotrifluoroethane [C2F3Cl3], was used. It is cheaper than pure Freon. Possibly, they simply wanted to economise," he said.

He added that there were unmistakable signs of poisoning, which could not have been caused by Freon: "People were collapsing as though they had been shot."

07 The Kirov class cruiser PYOTR VELIKY (closest to camera) and the Udaloy class anti-submarine warfare ship ADMIRAL CHABANENKO in Venezuelan waters during November for joint exercises.



Breathing Freon is generally safe, but if the concentration in the air is high then suffocation can result.

He said 46 people had been hospitalised, not 21 as officially announced.

It was previously reported that the deaths were caused by a crew member activating the fire safety system without permission or by the wrong data being entered into the temperature sensor.

Submariner Dmitry Grobov is suspected of having entered the wrong temperature data for the submarine's living quarters, which caused the fire suppression system to release the Freon gas.

However, former Russian Navy officers have said they doubt that Grobov was solely to blame since it is impossible for one person to activate the system, which is security protected from unauthorised activation by multiple authentication levels.

The submarine's nuclear reactor was not affected by the accident, which took place in the nose section, and radiation levels on board remained normal.

Investigators earlier announced that they had brought criminal charges against the crew member, and that he faced up to seven years in jail if found guilty.

The incident is the worst for the Russian Navy since the sinking of the KURSK nuclear submarine in 2000 when all 118 sailors died.

The construction of the Akula II class Nerpa nuclear attack submarine started in 1991, but was suspended for over a decade due to a lack of funding. Akula II class vessels are considered the quietest and deadliest of all Russian nuclear-powered attack submarines.

Based in the Russian Far Eastern city of Komsomolsk-on-Amur, the Amur Shipyard has built 270 vessels, including the Nerpa and another 55 nuclear submarines since it was established in 1936.

It is understood that Nerpa was destined for the Indian Navy on a lease arrangement.

HORNET CELEBRATES 30TH ANNIVERSARY

The F/A-18 Hornet community celebrated the 30th

anniversary of the legacy aircraft's first flight Nov. 18.

The Hornet, introduced as a multimission aircraft, was designed to replace the US Navy's F-4 Phantom and A-7 Corsair II in each of their respective fighter and attack roles.

"Throughout its 30 years of service in the fleet, it has demonstrated its capability and maintainability," said USN Capt. Mark Darrah, F/A-18 and EA-18G (PMA-265) programme manager.

Darrah noted that the Hornet has proven its multimission capability. He recounted that on the first day of Operation Desert Storm; two Hornets shot down an enemy fighter jet and continued on to destroy their assigned target. During the Kosovo War, Marine F/A-18Ds were used during the rescues of downed US Air Force pilots.

Currently, 636 Legacy Hornets are part of 62 active, Reserve, training and research, development, test and evaluation squadrons within the US Navy and US Marine Corps fleet. Seven international partners also fly the Hornet.

The entire F/A-18 family of aircraft, including the Hornet, Super Hornet and EA-18G Growler, commemorated the accumulation of seven million flight hours in July.

"The Super Hornet and Growlers, built on the platform of the Hornet, are destined to continue the 30-year F/A-18 achievement in the future," said Darrah.

MARINE HELICOPTERS GET MORE POWER

Planned upgrades to the USMC's CH-53D Sea Stallion and CH-53E Super Stallion engines will give pilots more power on hot temperature and high altitude flights, and Marine Heavy Lift squadrons the ability to carry more equipment, weapons, supplies and personnel further.

With a few engine upgrades already in test at Patuxent River Naval Air Station's Helicopter Test and Evaluation Squadron 21, fleet operators will soon have an increased payload capability due to increased power on the CH-53D and CH-53E engines.

"What we are doing is actually very simple. We're outfitting the Sea Stallion and Super Stallion's

engines to run hotter which results in more power," said Stoney MacAdams, H-53 Assistant Deputy Programme Manager. "More power equals heavier loads carried further which equals more options and supportability for our troops on the ground."

"The CH-53D and CH-53E new engine testing is proceeding along; with both aircraft having completed functional check flights and beginning engine specific performance testing," said Maj. Jack Perrin, H-53 Platform Coordinator for Helicopter Test and Evaluation Squadron 21, Patuxent River, Md. The two General Electric T64-GE-413 turboshaft engines used on each CH-53D, which has been in-service since 1969 carrying much needed supplies, equipment and personnel from ships to inland battle zones, will receive an upgraded fuel control along other key improvements including erosion-resistant titanium nitride compressor airfoils and increased-durability hot section components.

"With the extra lifting power delivered from these upgraded engines, the Super Stallion will continue to deliver equipment and heavy weapons such as M198 howitzers and Humvees as well as perform troop insertions.

The Navy's MH-53E Sea Dragon helicopter, a CH-53E derivative, already operates with three T64-GE-419 turboshaft engines for its primary mine countermeasures missions.

USN ACCEPTS WRECK OF JFK'S PT-109

Experts from the US Navy have recently announced that the remnants of a boat found in May 2002, in 360 metres of water in the South Pacific, are the remains of the boat skippered by John F Kennedy in the Second World War. The National Geographic exhibition, led by Robert Ballard, first sighted the wreck six years ago.

Almost 60 years ago a Japanese destroyer, appeared out of the darkness in the early hours of the morning. It drove over the top of PT-109, skippered by 26 year old John F Kennedy, ambassador's son, millionaire heir and soon to be President of the United States. The destroyer sliced through the PT-109, instantly killing two members of the crew and leaving the rest clutching onto the still-floating bow section.

08 The first CH-148 Cyclone helicopter during its first flight. (Sikorsky)





Realising that there would be no rescue mission for the missing boat, Kennedy encouraged his men to make the several-hour swim to the nearest deserted island. In spite of a back injury, with fierce determination, Kennedy grabbed one of his crew member's vests in his teeth and swam with him. Thirsty, starving and exhausted the men were finally rescued by some Solomon Islanders in dugout canoes. The islanders had ease of movement during the day, undetected by the Japanese. They passed onto the coastguard a coconut with a rescue message carved by Kennedy. Six days after their boat was destroyed, Kennedy and his remaining crew were hauled aboard a sister PT boat. The coconut, which had been the instrument that saved the men's lives, was proudly displayed on the Oval desk at the White House, throughout Kennedy's presidency.

09 MEDVEDEV SAYS RUSSIA, INDIA MUST FINALISE VIKRAMADITYA TERMS

Russia and India must finally agree on the revised terms of a contract to deliver a modernised aircraft carrier to the Indian Navy and ensure the implementation of the project, the Russian President said on during December before a visit to India.

The original USD\$750 million contract to deliver the ADMIRAL GORSHKOV to India, which Russia's state-run arms exporter Rosoboronexport signed with the Indian Navy in 2004, stated that the work would be completed in 2008.

However, Russia later claimed it had underestimated the scale and the cost of the modernisation and demanded an additional USD\$1.2 billion, which New Delhi said was "exorbitant".

"This issue is not the simplest one in our relations," Dmitry Medvedev told reporters on the eve of his December 4-5 visit to India.

"However, I believe that we must show mutual respect, agree on the final terms of cooperation in this project, and ensure its successful implementation," he said.

According to various sources, after long-running delays and disputes, Russia and India agreed in February 2008 to raise retrofit costs for the aircraft carrier, docked at the Sevmash shipyard in northern Russia for the past 12 years, by at least \$800 million.

However, Sevmash officials later claimed that the ongoing maintenance and upgrade made up 60-70% of the carrier's cost, or at least \$2 bln.

The current contract covers a complete overhaul of the ship and equipping it with modern weaponry, including MiG-29K Fulcrum aircraft and Ka-27 Helix-A and Ka-31 Helix-B anti-submarine helicopters.

Sevmash has said if New Delhi provides sufficient funding to complete work then the construction of the ship will be completed in 2010 and tests will start in 2011, while in 2012 it will be handed over to the Indian Navy.

The carrier, renamed the VIKRAMADITYA, is to replace India's INS VIRAAT carrier, which, although currently operational, is now 50 years old.

After modernisation, the carrier is expected to be seaworthy for 30 years.

RCN HALIFAX CLASS TO BE UPDATED

Saab Systems has signed a subcontract with Lockheed Martin Canada worth approximately \$200m for command and control systems and fire control directors for the 12 Canadian Halifax class frigates.

The Canadian Government has entered a C\$2 billion contract with Lockheed Martin Canada which will see Australians assisting the modernisation of 12 Halifax class frigates

Saab Systems in Sweden is the principle subcontractor for the command and control system and radar upgrade, having signed a contract with

Lockheed Martin Canada on the 23rd of November. Saab Systems will provide fire control directors and other combat systems capabilities and will utilise Australian systems integration expertise on the project.

Lockheed Martin was attracted to Saab's combat management system because of its open architecture design and because of the performance of Saab's highly developed fire control directors. The system to be installed on the Halifax class will be known as Canadian Advanced Command and Control System-9LV (CanACCS-9LV) and will involve the integration of Saab's 9LV combat management system with Canadian command and control systems.

"The partnership with Lockheed Martin Canada proves that the modular design and open architecture of 9LV Mk4 is successful and can be integrated with a variety of other systems," said Mr Peter Wimmerström, President of Saab Systems business unit.

Saab Systems in Australia will provide significant support under the sub-contract because of the local company's leadership in combat systems design and integration as demonstrated on the Anzac class frigates. The Saab 9LV combat management system is installed on the Anzac class and will be installed on Australia's new LHD amphibious support ships.

The Canadian contract comes at a time when the Anzac Anti-Ship Missile Defence upgrade contract has achieved Critical Design Review of the combat system. Sea trials of the CEA phased array radar have also concluded successfully.

The Canadian Navy has 12 Halifax class frigates that were constructed at the Saint John shipyards in New Brunswick and Marine Industries Shipyards in Sorel, Canada 1992-1997.

The frigates will now go through an extensive midlife upgrade starting in 2010 with HMS TORONTO. All 12 frigates will have received their upgrade by 2017.

09 The newly refurbished and modernised aircraft carrier, VIKRAMADITYA, floating out of her dock for further fitting out.





PROTECTION COMMAND (EX-COASTWATCH)

Periodically over the years the question of an Australian Coastguard has arisen, to be followed by an Inquiry at the conclusion of which the government-of-the-day tinkered with existing arrangements and life went on much as before. Another Review is upon us!

One of the problems has been the large number of government authorities with an interest in the large area of sea over which Australia has jurisdiction and responsibilities - some 10.7 million kilometres, a larger area than the mainland; they include Customs, Transport, Immigration, Fisheries and Foreign Affairs among others. Which authority should pay for what facility has been the cause of much argument.

In 1988 a comprehensive report - the Hudson Report - as well as dealing with the financial aspects recommended the establishment of a semi-independent Agency with an Executive Director to direct, co-ordinate and manage civil coastal and offshore surveillance operations, the Agency to be serviced by the Department of Transport. An advisory committee comprised of representatives of the various authorities involved was also to be formed with the Agency Director as chairman.

Nearly all the Hudson recommendations were implemented over time, although Customs, not Transport became the parent body and an Executive Director was not appointed until 1999: At that time an experienced naval officer. Rear Admiral Russ Shalders, later to become the RAN's Chief, was appointed Director-General of Coastwatch. An RAN flag officer has held the post since then and to all intents and purposed the arrangements appear to have worked satisfactorily.

Suggestions that Australia should have a US-style Coast Guard seem to ignore reality. Although the coastlines and marine areas over which they have responsibilities are comparable, the US Coast Guard has inland interests not contemplated in Australia. The considerably larger population of the United States is also better placed to support what are in effect two navies.

PLANNING DEFENCE

Given continuing financial problems around the world, it would seem the Defence Minister's intention to extend the previous government's 3% annual increase in defence spending to 2018, may be rather ambitious - will the money be available? There are many imponderables.

Will the troubles effect capital works such as shipbuilding or the cost of aircraft? Will labour costs rise or fall? Will recruiting for the ADF be effected? Will financial stress affect international relations, probably one of the most important issues?

Uncertainty has bedevilled defence planners and forecasting for many years - back to the nineteen-sixties at least; it is difficult to see any sign of change in the foreseeable future.

SERVICE AT SEA

Once upon a time Press Gangs were needed to 'recruit' crews to enable ships to proceed to sea but as time went on conditions in ships improved

causing compulsion to be unnecessary: Indeed, life at sea in the Merchant Service or Navy became the ambition of thousands of young men (and later, women). Recruiting ceased to be a problem.

The wheel has turned and today - and for some time past - shipping companies and navies including the RAN, have found it difficult to recruit sufficient men and women from among their own nationals to meet manning requirements. Why is this so?

Conditions in the Merchant Service - and certainly conditions of service in the RAN - are better than they have ever been. Is the problem due to the wider choice of careers open to young men and women? Family ties? (not so long ago junior sailors and naval officers could not afford to marry or take a partner, let alone support a family..). Is it a reluctance to accept discipline or perceived loss of independence? Or a combination of factors? Maybe the wheel will turn again and a seagoing career will become attractive to young Australians...maybe.

SERVICE IN THREE COUNTRIES

The resignation of John Bird as a Federal Vice-President of the Navy League of Australia marked the end of an exceptionally long period of service to the League - or rather, three Navy Leagues.

John Bird entered the Royal Navy in 1942. As a young Flight Sergeant in the Air Training Corps he, was quickly earmarked for the Fleet Air Arm. and after courses became an Observer, serving as a Midshipman until eligible by age to be commissioned as a Sub Lieutenant. Demobilised in 1946 he became a Reservist and remained active until 1955 when, by then a qualified architect, married and with a family, he migrated to New Zealand.

John-became associated with the Navy League while still serving in the RN, when he was invited to 'commission' a new Navy League Sea Cadet Unit in Bath. His interest continued in New Zealand and he became the founding secretary of the Northland Division of the Navy League of New Zealand, continuing in office until 1970 when with his family he migrated to Australia.

In Australia John joined the Victoria Division of the Navy League, became a member of the Executive Committee and President of the Division and Member of the Federal Council in 1976.

In 16 years as State President John Bird introduced a number of measures designed to maintain the close relationship existing between the League and the RAN. The Federal Council at the time was engaged in a number of issues including the aftermath of several disasters in the nine teen-sixties, integration of the Armed Forces, the Replacement of the carrier HMAS MELBOURNE and with it the future of fixed-wing flying in the RAN. John's contribution, not least to naval aviation matters, was greatly appreciated. In Victoria an annual yacht race organised in conjunction with the Royal Yacht Club of Victoria continues to the present time, as do other activities introduced during his watch.

The Navy Leagues and Navies of three countries have reason to be grateful to John Bird for, in all, 66 years of service.

2009 Australian Navy Foundation Day (ANFD) Creswell Oration

The Victorian Division of the Navy League of Australia, Naval Association of Australia, Naval Historical Society and Naval Officers Club are again jointly sponsoring the Annual Creswell Oration on Navy's Foundation Day - its birthday. The Navy League coordinates the event under the 2009 ANFD Organising Committee Chairman LCDR John Redman RAN, Chairman Naval Officers' Club in Victoria.

Date: Sunday 1st March 2009

Oration Presenter: Rear Admiral Steve Gilmore AM CSC RAN, who will also participate in the ANFD Thanksgiving Service.

Venues: *Anglican Mission to Seafarers* Chapel of St. Peter the Mariner for Annual ANFD Thanksgiving Service. @ 1000.

Mercure Hotel, Spring St., Melbourne for ANFD Creswell Oration
Venue: - \$45ph. @ 1200.

Contact: ausnavyleague@mac.com

Payment: mail to "NLA Victoria Division P.O.Box 1303 Box Hill 3128 Victoria"



THE CONVERSION OF TSMV KANIMBLA TO AN ARMED MERCHANT CRUISER IN 1939

By PO Peter Cannon, RAN

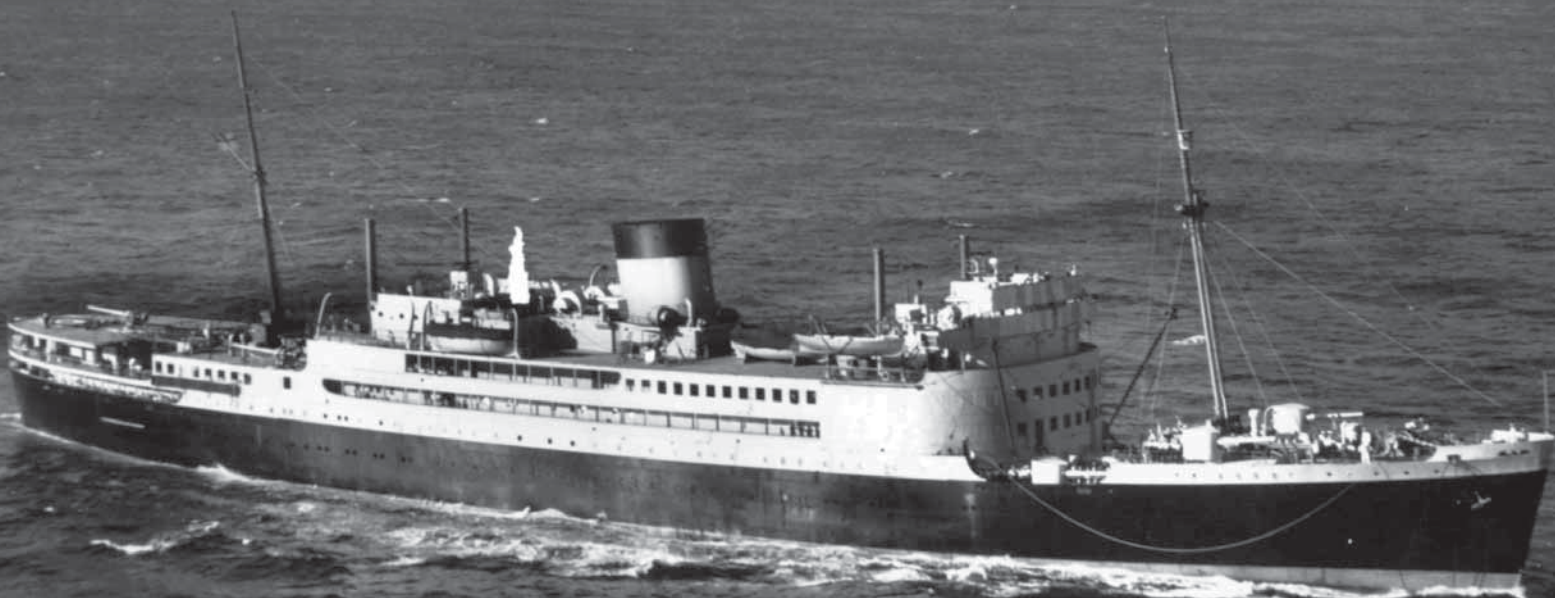
The successful fitting out and deployment of the Armed Merchant Cruiser (AMC) provided a rapid expansion of British and Australian naval capability. Despite being completely unsuited for combat against purpose built men-of-war and presenting overly large targets, the AMC carried out important patrol and maritime interception tasks in waters far away from the European war zone. Petty Officer Peter Cannon, in this his 1st place 2008 Navy League of Australia Professional Essay Competition entry, examines the 1939 conversion of TSMV Kanimbla to an AMC.

In August 1939 with the outbreak of war only days away, the British Government sanctioned the taking up from trade of particular medium sized passenger ships for immediate commissioning into the Royal Navy (RN). Long standing contingency plans called for 50 of these vessels to be converted in the shortest possible time frame to Armed Merchant Cruisers (AMC) as it was understood that there would never be enough purpose built cruisers on hand to cover all requirements. By prior agreement with the Admiralty, Australia undertook to convert and man three such ships for the RN as part of its Imperial defence policy commitments. Two British registered vessels were diverted to Sydney for this purpose while an Australian ship employed on coastal passenger services was also requisitioned to join them and fit out as an auxiliary warship. The early days of Australia's experience in World War II is rightly recalled as a time of hurried endeavour to overcome inadequate resources and preparation for conflict. The hasty arming and sending to war of large passenger liners does at first glance

smack of desperation and expediency. However this policy, whether justified by subsequent experience or not, had been laid down 20 years previously following the end of World War 1. This essay will not attempt to outline the strategic issues and agendas surrounding AMC policy but will follow the experience of the Australian motor vessel KANIMBLA's requisitioning, conversion and preparation for service as a man-o-war.

On 24 August 1939, an Order in Council was issued authorising both the British Board of Trade and the Admiralty to requisition British vessels as required. Two days later the Commonwealth Government received a request to requisition TSMV (Twin Screw Motor Vessel) *Kanimbla* on behalf of the Board of Trade and to make necessary arrangements for the ship to proceed to Sydney. She was then to be taken over for conversion to an AMC. A confidential letter was immediately despatched to the ship's Melbourne based owners,

HMS KANIMBLA on sea trials off the NSW coast after her conversion to an AMC. Three guns with shields can be seen on the forward section while two of the three 6-inch guns (without shields) can be seen facing after on the stern section. (RAN Seapower Centre)



Mcllwraith McEacharn Ltd, requesting them to deliver the vessel to Garden Island upon her scheduled arrival in Sydney on 4 September. The *Kanimbla* was a 10,985 ton coastal passenger liner built at Harland & Wolff's famous Belfast shipyard in Northern Ireland. She had been completed in 1936 to such a luxurious standard that many observers considered her too fine a ship to be limited to the Australian inter-state trade. She also happened to be precisely the type of ship the Admiralty were looking for to add to their list of potential AMCs. With Commonwealth Government consent, the Admiralty made arrangements with the company to earmark their ship for service as an Imperial (i.e. RN) AMC in time of war. The only other ship on the Australian register to be assigned to the RN would be Burns Philp's *Bulolo*, completed in 1938. Whilst on the stocks *Kanimbla* was stiffened to carry seven 6-inch (152mm) low angle and two 3-inch (76mm) high angle guns. Some stiffening was built into the structure while other components that would hinder her normal peacetime operation were made to be portable and stowed aboard. Following her delivery voyage to Australia, *Kanimbla* commenced her first coastal service on 10 June 1936. She usually operated the major ports between Fremantle and Cairns depending on the time of year.

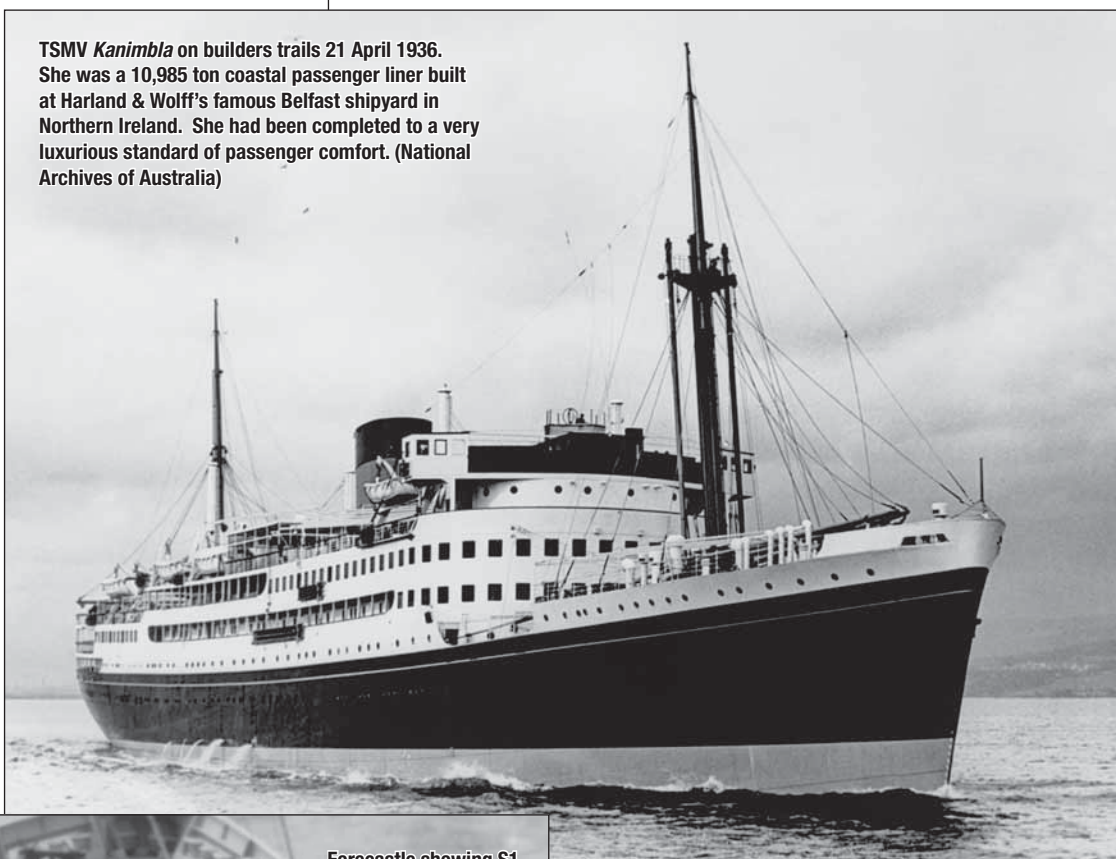
Australia's emergency naval mobilisation plan called for five AMCs to be converted in Sydney using stockpiled equipment and manned primarily by reservists. Three ships would be commissioned into the RN on Admiralty account. All costs including stores and crew payments would be paid for by London. They were to be commissioned as HM Ships and would operate on foreign stations. A further two would be locally owned ships commissioned into the RAN for the protection of maritime trade on the Australian Station. On 25 August 1939, the British-owned liners *Moreton Bay* and *Arawa* were requisitioned and ordered to Sydney while KANIMBLA became the third Imperial AMC. *Bulolo* was also taken up in late September but was fitted out in South Africa and crewed by British sailors. The RAN did not take over its two ships, MANOORA and WESTRALIA, (The later being substituted for the unsatisfactory

Duntroon) until October.

Kanimbla was alongside in Cairns when Mcllwraith McEacharn was informed of her requisitioning, but she completed the remainder of her scheduled stops in Townsville, Mackay and Brisbane whilst returning to Sydney. War did not actually break out until 3 September, the ship arriving the following day to discharge passengers and cargo at Darling Harbour. She was then handed over to the Navy at Garden Island early on 6 September 1939. The British Government hired *Kanimbla* on a charter basis where the owners were paid by monthly instalments. Legal complications due to the ship's Australian ownership saw arguments over rates of hire continue well into 1941 but were eventually settled at £4,400 per month. Another £1,000 per month was also paid to cover management and organisational expenses unique to Mcllwraith McEacharn's liner business.

In the lead up to war, the Admiralty had been anxious to observe its obligations under international treaties covering the arming of merchantmen for offensive purposes. To this end it was stressed that the ships be commissioned as warships before any arming took place.

TSMV *Kanimbla* on builders trails 21 April 1936. She was a 10,985 ton coastal passenger liner built at Harland & Wolff's famous Belfast shipyard in Northern Ireland. She had been completed to a very luxurious standard of passenger comfort. (National Archives of Australia)

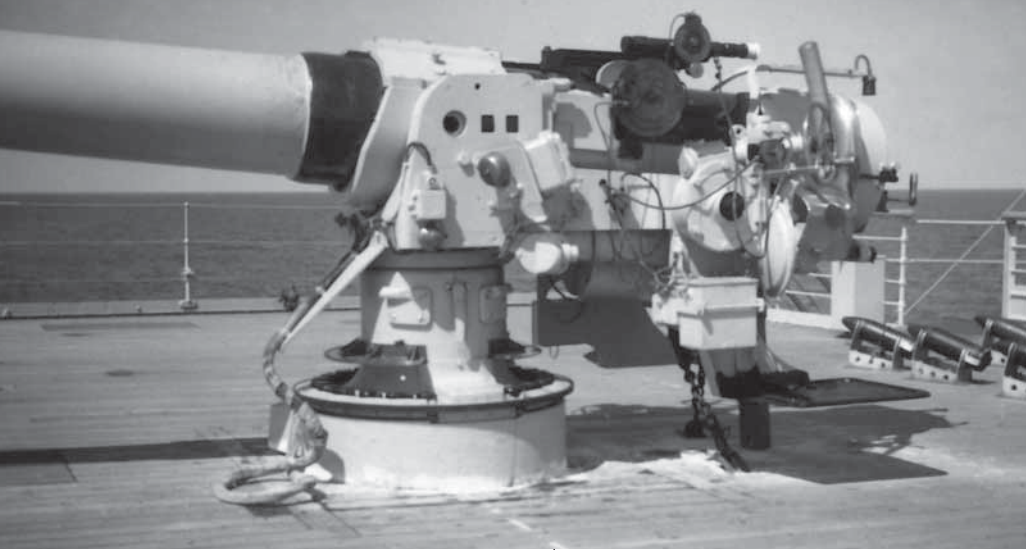


Forecastle showing S1 6-inch gun and shell stowage racks 1940. (Harold Greer)



With the declaration of war on 3 September this requirement lapsed, however the ships were still commissioned upon being handed over to the Navy. HMS KANIMBLA was therefore formally commissioned into the Royal Navy on 6 September 1939 by Lieutenant Commander GCF Branson, a retired RN Officer living in Australia who was placed in temporary command. Her designated Commanding Officer, Commander FE Getting RAN was Executive Officer in HMAS CANBERRA at the time and would not join until 4 October. Branson was to remain aboard as Executive Officer. Captain Getting would later lose his life in command of CANBERRA at Savo Island when his ship was put

Poop Deck 6-inch gun and shell stowage racks.
(Con Cannon)



out of action by the Japanese in August 1942.

The job of refitting *Kanimbla* was allocated to Garden Island Dockyard. Cockatoo Island had taken on *Moreton Bay's* conversion amongst other significant work preparing the Australian Squadron for war whilst *Arawa* was to be fitted out at Mort's Dockyard in Balmain. Garden Island was to undertake all gun mounting and electrical tasks for the three ships. Work on KANIMBLA began as soon as she had been handed over, some of her original merchant service crew temporarily remaining onboard as McIlwraith McEacharn employees. It was the Navy's intention to have as many of the crew sign on with the Royal Australian Navy Reserve as possible, particularly the engineers as the RAN at that time had no experience with diesel powered vessels whatsoever. Luckily the entire engineering department elected to stay with the ship along with a handful of stewards, cooks and seamen. Another 11 engineers were required however, due to the fact that the ship was only manned with enough engineers for coastal service, some routine maintenance being carried out by shore staff. The remainder of her new crew was made up primarily of pre-war reservists mobilised for full time service along with 'hostilities only' sailors joining for the first time.

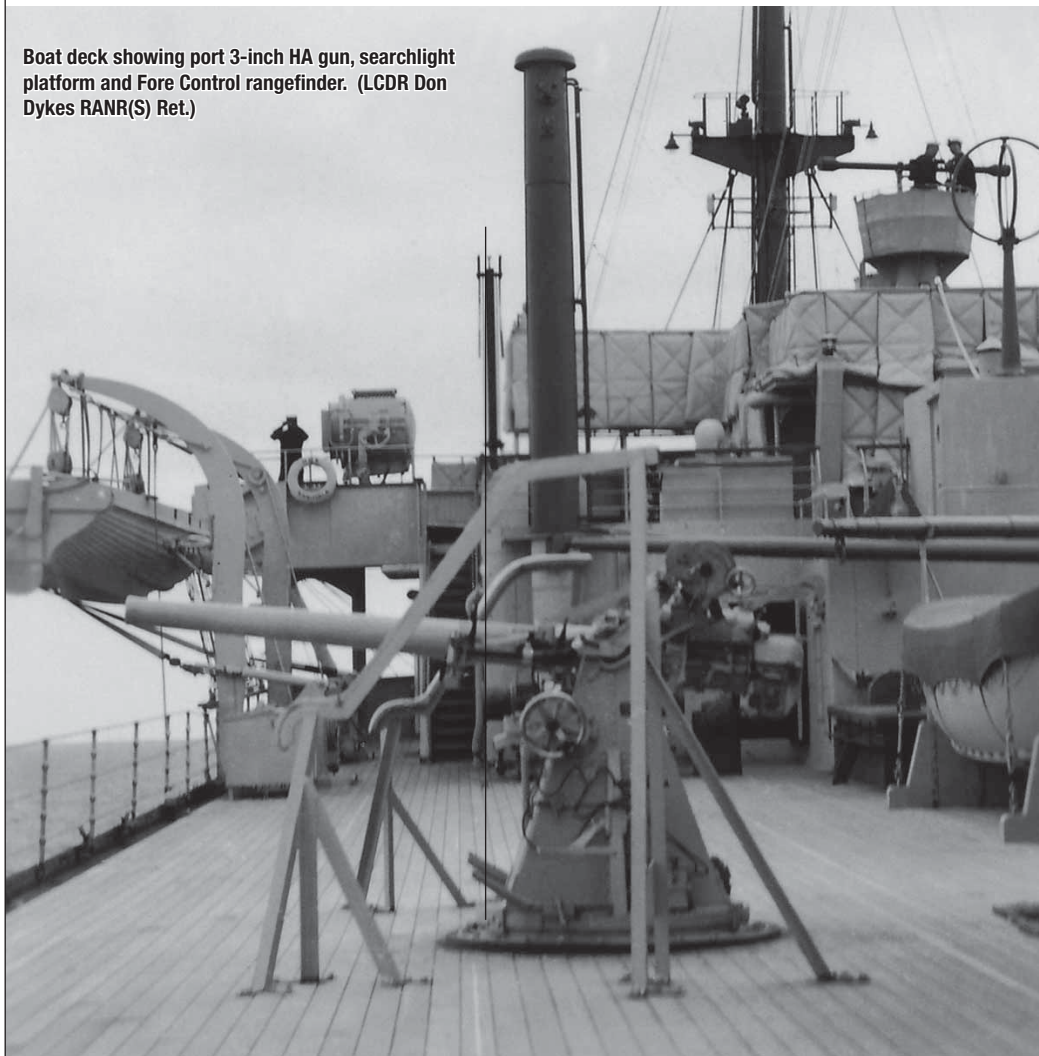
In 1939 Garden Island Dockyard, still separated from Potts Point by Sydney Harbour, was capable of undertaking all kinds of refitting work with the exception of dockings, large engineering repairs and major structural work. This was in addition to gun mounting, electrical work, boat building and a considerable capacity for the manufacture of naval stores. Standard plans for the conversion of passenger liners into AMC's had been prepared by the Admiralty in 1936, using the P&O line's *Carthage* as a baseline.

Harland and Wolff had also produced a detailed plan for mounting KANIMBLA's allocated armament including installation of stiffening and ships fittings needing to be removed to allow the guns to train and depress to maximum advantage. Admiralty intentions called for three different standards of conversion; Emergency, Semi-Complete and Complete Equipment. The determining factor would be the length of time allowed for the ships to proceed on operations. Emergency conversion involved the bare minimum of work to turn a liner into

a warship and get her to sea. Semi-complete required more thorough preparation regarding magazines, accommodation and reduction of fitted woodwork, while complete equipment went much further and included a full director system of fire control. Such equipment was not available in Australia and local conversions would be to semi-complete standard. Armament and naval stores for five ships had been collected in Sydney since the early 1920s. The equipment for the two Australian ships primarily came from retired RAN warships while the three Imperial AMC's had theirs shipped from the United Kingdom, a process that continued into 1939. The coming of war found these stores incomplete, and some gear had to be taken from the RAN stockpile with the proviso it be urgently replaced from Britain.

The most conspicuous aspect of the conversion was of course the fitting of a warship's armament and the dockyard began the refit by preparing the designated gun positions. Two 6-inch guns were to be fitted on the Forecastle in Number 1 position, one to port, and the other to starboard while the forward well deck carried both Number 2 guns. The Number 3 weapons were to be aft on the Promenade Deck while the single Number 4 gun would occupy a centreline position on the Poop Deck with a 280° training arc allowing it to fire on either beam. This arrangement allowed for a four-gun broadside using seven single mountings. A single 3-inch

Boat deck showing port 3-inch HA gun, searchlight platform and Fore Control rangefinder. (LCDR Don Dykes RANR(S) Ret.)



anti-aircraft gun would be fitted either side of the motor casing on the Boat Deck. The teak decking was taken up at the various positions to reveal gun mounting packing rings already secured to the steel deck below. Ventilators on the Forecastle were removed to clear the area for guns and the paravane equipment needed to deflect moored anti-ship mines in shallow waters. Similar work was undertaken on the Poop Deck to clear No. 4 gun's field of fire. Tennis courts were also dismantled on both the Poop and Boat Decks along with the removal of the Promenade Deck lifeboat davits to clear deck space for both No. 3 guns. Between 29 September and 1 October, Cockatoo Island's huge floating crane TITAN was alongside lifting the guns and their mountings aboard. They consisted of seven 6-inch BL Mark VII guns on PIII mountings for surface work and two 3-inch QF Mark I guns in Mk II HA mountings as the primary anti-aircraft battery. This equipment had been in store on Sydney's Spectacle Island since 1926-1927.

when stockpiling had been instituted in the 1920s and this was still largely the case in 1939. Two single .303-inch (7.69mm) Lewis machine guns made up the entire close range armament. To supply the guns, two 6-inch shell rooms were built in Numbers 2 and 4 holds with cordite magazines directly above, all of which were below the waterline. A magazine for 3-inch fixed ammunition was placed in Number 3 hold and all of these compartments were fitted with emergency flooding arrangements. Enclosed trunks were then installed from the magazines up to plated over hatch covers and serviced by existing ship's winches. This allowed ammunition to be hoisted to weather deck level where supply parties manhandled it to the guns. Ready use 6-inch shells were also stowed on deck in single racks while cordite charges were held in lockers. There were also 3-inch ammunition lockers adjacent to the guns.

Fire control and communications were of a very

armament and fire control arrangement was deemed to be acceptable as AMCs were not intended to engage regular enemy warships and were supposed to operate only in areas where the air threat was negligible. On 16 October, the ship proceeded to Sutherland Dock at Cockatoo Island to have her paravane gear fitted along with other underwater work and on completion was taken alongside Number 8 Berth, Woolloomooloo Bay on 21 October.

The Woolloomooloo finger wharf was owned by the Maritime Services Board and was used to unload and accommodate masses of furniture, fittings and stores from the ship. Accommodation was one area where a large passenger ship like *Kanimbla* was by far superior to any other ship in the navy. First class passenger cabins on the Bridge Deck and amenities such as spacious lounge rooms on the Promenade Deck were taken over for the ship's officers virtually unmodified. Even the most junior Midshipmen found themselves berthed two to a cabin and that was only because their superiors ensured that rank retained some privileges; there being no shortage of single cabins. The ratings weren't quite as lucky as there was time available to strip cabins on the Awning Deck to provide traditional naval broadside messes, basically hammocks and wooden mess tables. There was however vastly more room than any warship and the recreation facilities were unrivalled. It should also be mentioned that the ship sailed for war still equipped with her swimming pool!

The last major concern was the ship's stability and buoyancy. Significant amounts of top weight, primarily the guns and associated equipment, had been mounted high in the ship upsetting her designed sea keeping characteristics. Precise displacement and stability calculations for KANIMBLA have not survived, however 516 tons of equipment and fittings including 119 tons of armament were added to MORETON BAY during her conversion. Only 196 tons of her existing fittings were removed. This along with the ship not carrying any cargo would cause her to ride higher in the water and decrease her stability along with presenting a larger target than was already the case. The addition of ballast and buoyant cargo would improve both the ship's stability and her endurance. The buoyant cargo would also vastly increase the ship and her crew's survivability by preventing capsizing if holed beneath the waterline, as she was not designed with warship standards of subdivision in mind. It also ensured that she would be a steadier gun platform, a critical consideration given the fire control technology of the day. KANIMBLA's completion was delayed while precise information was requested from London regarding the stowage of her buoyant



Improvised depth charge racks cut in after bulwark on Awning Deck 1940. (Con Cannon)

The 6-inch guns were of a particularly ancient model, Mark VII's having first gone to sea in 1901. One of them was reputedly stamped with a manufacture date of 1899. All of these weapons had been removed from obsolete British battleships and cruisers upon being broken up at the end of World War 1. Only the four forward weapons were fitted with gun shields, those from cruisers having been originally fitted with them while battleships guns were mounted in casemates. The 3-inch weapons had been the first anti-aircraft guns in the RN, first fitted in 1914. Both models represented the only widely available second-hand armament

basic standard. They consisted primarily of a 9-foot rangefinder and a Light Type director on a forward control position above the Flying Bridge for directing the main armament against surface targets. High angle control was provided by another 9-footer modified as a height finder and mounted aft above the Engineers House. The directors were of a style used in World War I destroyers; indeed the two Australian AMCs later used equipment removed from the recently scrapped S class destroyers. Unlike the more modern director systems fitted in the navy's regular cruisers, Light Type only provided for gun bearing data, not elevation. This weak

material, it not being required in the other two ships. Whilst alongside Woolloomooloo, the ship was loaded with 1,280 tons of rock ballast in three holds along with 22,500 cubic feet of buoyant material consisting of timber and bagged cork. Finally 13,642 steel drums were stowed in the holds, Orlop and tween decks secured by a further 4,000 cubic feet of timber. The drums consisted of 44, 46 and 47 gallon sizes and had been manufactured in a rush in Sydney by Rheem. This work began as soon as the ship arrived from Cockatoo and continued until she moved back to Garden Island on 4 November.

This work concluded the primary facets of KANIMBLA's conversion, but many other extensive modifications had also been carried out. The bridge was rebuilt to provide two 36-inch searchlight positions and a compass platform, improvised depth charge chutes were installed along with smoke floats, crows nest, service pattern cutters and motor boats. The only protection fitted to the ship was 0.5-inch (12.7mm) steel plating around the forward transmitting station, 1-inch plate over the steering gear compartment and splinter mattresses around the bridge and compass platform. With the bulk of the dockyard work complete, KANIMBLA and her crew continued to prepare the ship for sea along with running gunnery trials off Sydney Heads on the 13th. Minor repairs and alterations were required as a result of the trials and the ship completed her

conversion on 22 November 1939. The result was a rough 12,000 ton AMC. Work up training was undertaken with the ship sailing from Sydney for Port Phillip Bay on 27 November and returning on 8 December. KANIMBLA finally sailed to join the two other Australian manned AMCs based on Hong Kong as part of the RNs China Station on 13 December 1939. It would be two years before her crew would see Australia again.

The successful fitting out and deployment of the three Armed Merchant Cruisers for the Royal Navy saw the RAN fulfil a key pre-war commitment to the rapid expansion of British Empire naval capability. Despite being completely unsuited for combat against purpose built men-of-war and presenting overly large targets, they carried out important patrol and maritime interception tasks in waters far away from the European war zone. The powerful modern cruisers they relieved were redeployed to more directly threatened areas to undertake the far more dangerous duties for which they had been designed. This effort also saw Australia with its somewhat limited resources not only provide for the defence of shipping in local waters but contribute, along with two regular cruisers and five destroyers, to the overall defence of Empire shipping at sea in the first months of World War II.

TSMV *Kanimbla's* complex conversion into an auxiliary cruiser was carried out by Garden Island Dockyard in 11 weeks with efficiency

made possible by years of planning as well as adaptation in meeting unforeseen challenges. During the course of the war, AMCs were found to be outclassed in combat by the carefully converted merchant raiders fielded by the German Navy and many ships including KANIMBLA underwent further modifications in an effort to bridge the capability gap in offensive firepower and survivability. KANIMBLA's modern design, reliable machinery and equipment made her one of the more suitable British Commonwealth AMC conversions. In service she went on to become one of the most successful AMCs of the war; by the time she returned home in December 1941, she had captured more shipping and steamed further on operations than any other ship flying the White Ensign. She was converted yet again in 1943 to support MacArthur's Pacific amphibious assault operations as an infantry landing ship and was not returned to her owners until 1950.

**HMS KANIMBLA on patrol north of Japan
20 March 1940. (KANIMBLA Association)**





MINE WAREFARE IN AUSTRALIAN & NEW ZEALAND WATERS

By Murray Dear

While the past is another country, it can also be a window into the future. Australia and New Zealand faced similar mine warfare incursions during both world wars and each country continues to maintain a mine countermeasure capability in the event that such a threat may arise again.

Mines were first used during the American Civil War, most famously at the Battle of Mobile Bay. It was during the Russo-Japanese War of 1904-05 that mines first made a significant impact on naval warfare. The Russian battleship PETROPALOVSK and the Japanese battleships HATSUSE and YASHIMA were all lost due to well laid enemy mines.

WORLD WAR I

In 1914, no thought had been given by the Admiralty to the possibility that German raiders might lay mines in Australian or New Zealand waters. Following the outbreak of World War I, German mine laying operations were initially confined to the North Sea and around the British Isles. These operations, undertaken by auxiliary minelayers, had some success including the sinking of the dreadnought battleship AUDACIOUS and the light cruiser AMPHION. In the Pacific, two German Hilfskreuzers (auxiliary cruisers) were quickly fitted out at Tsingtao for raiding operations in the South Pacific. Neither the PRINZ EITEL FRIEDRICH nor the CORMORAN carried mines and both ships were eventually interned. When the light cruiser DRESDEN was sunk at Juan Fernandez Island in March 1915, the Imperial German Navy effectively ceased to exist in the Pacific Ocean.

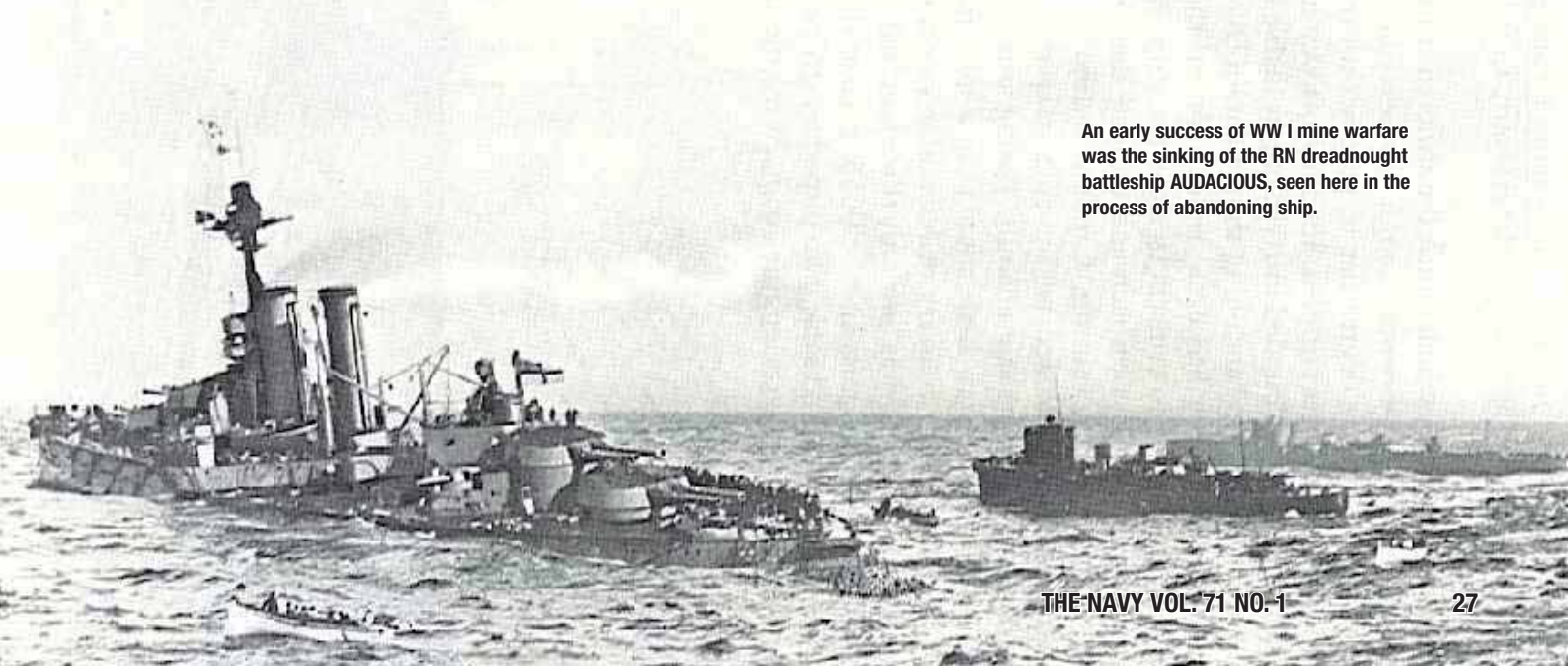
The first wave of Hilfskreuzers had only modest success being converted passenger liners and voracious coal burners. The German answer to this problem was to use more modest steamers, which loaded with extra coal, would be capable of long range raider operations. In November 1916 the Hilfskreuzer WOLF armed with four 150mm guns, one 105mm gun, four torpedo tubes, 465 mines and a seaplane, sailed from Kiel. With a coal capacity of 6,000 tons and consumption, at eight knots, of only 35 tons per day this

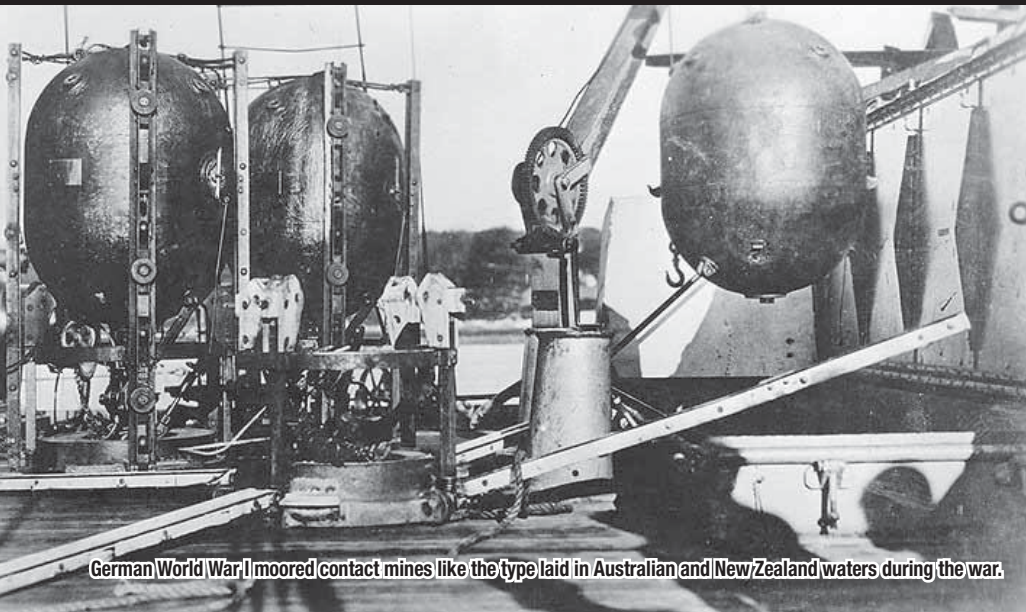
raider had a prodigious range. After successfully avoiding the Royal Navy blockade, WOLF slowly sailed southward and then eastward into the Indian Ocean. Mines were laid off the Cape of Good Hope, Bombay and Colombo. In April 1917, WOLF slipped south then east of Australia and New Zealand for a self refit at Sunday (now Raoul) Island in the Kermadec Islands. At Sunday Island, WOLF seized the steamer Wairuna and the schooner Winslow then sailed south to commence mine laying operations in the Tasman Sea (see Table 1).

The three minefields were laid athwart choke points where there was likely to be a concentration of merchant shipping. The Gabo Island minefield was meant to consist of 25 mines but was not completed as a vessel sighted by the WOLF, incorrectly identified as the RAN cruiser ENCOUNTER, forced the raider to run for safety. After capturing two sailing vessels and the steamer Matunga in the South Pacific, the WOLF laid 110 mines in the South China Sea before successfully returning to Kiel. During its cruise of 64,000 miles, the WOLF sank or captured thirteen ships and a further sixteen ships were either sunk or damaged by mines laid by this raider.

Each minefield laid in the Tasman Sea resulted in a victim. The first to be sunk was the steamer *Cumberland* off Gabo Island on 6 July 1917 and the second was the steamer *Port Kembla*, sunk off Cape Farewell on 18 September 1917. Both the Australian and New Zealand governments believed that the two ships had been sunk by internal explosions resulting from sabotage. The WOLF's minefields were not revealed until a prisoner's message in a bottle was discovered in the Celebes. The last mine victim was the passenger liner *Wimmera* sunk off Cape Maria van Diemen on 26 June 1918. The official enquiry found that the captain had ignored Admiralty instructions regarding mines in the area.

An early success of WW I mine warfare was the sinking of the RN dreadnought battleship AUDACIOUS, seen here in the process of abandoning ship.





German World War I moored contact mines like the type laid in Australian and New Zealand waters during the war.

Once the existence of WOLF's minefields had become apparent, plans were made on both sides of the Tasman to commence sweeping operations. Three Castle class trawlers, *Brolga*, *Gunudaal* and *Koraaga*, were requisitioned from the NSW Government and manned by the RAN Brigade to sweep the Gabo Island minefield. Three tugs, CECIL RHODES, CHAMPION and JAMES PATERSON, were also used as auxiliary minesweepers.

In New Zealand, the trawlers *Nora Niven* and *Simplon* were requisitioned together with the whale chaser *Hanau II*. The Farewell Spit minefield was swept first with the two trawlers using the elderly cruiser PHILOMEL berthed at Wellington as a minesweeper depot ship. The northern field was then swept by both trawlers with a later sweep also being undertaken by the *Hanau II* using Acteon sweeping gear.

THE INTER WAR YEARS

Following the end of the war, all requisitioned minesweepers were progressively returned to

their owners. In 1919, three RN Flower class minesweeping sloops, GERANIUM, MALLOW and MARGUERITE arrived in the South Pacific to undertake final sweeps of WOLF's minefields. When this had been completed, the three sloops were transferred to the RAN. Two similar sloops, VERONICA and LABURNUM, also served with the NZ Division of the RN. The Flower class sloops were eventually replaced by four Grimsby class escort sloops, SWAN and YARRA built for the RAN with LEITH and WELLINGTON in NZ service. Also acquired for the NZ Division was the Canadian built Castle class trawler WAKAKURA for service as a training vessel for the four Volunteer Reserve Divisions. Both countries wisely maintained a core minesweeping capability that could be rapidly expanded on the outbreak of war.

WORLD WAR II

Following the declaration of war in September 1939, minesweeping forces on both sides of the Tasman were quickly expanded to meet

the expected threat from mine laying German raiders. Eventually, some 35 Australian and 19 New Zealand trawlers and coasters were requisitioned as auxiliary minesweepers for the RAN and RNZN respectively.

As the threat of war with Japan intensified, the need for more capable mine warfare vessels resulted in new construction. The Australian response was to build 56 units of the Bathurst class for the RAN in eight shipyards. These vessels, officially designated as Australian Minesweepers, were to be the RAN's "maids of all work" and in addition to minesweeping they served as convoy escorts and undertook many other useful tasks. War losses comprised the ARMIDALE (Japanese air attack off Timor), GEELONG and WALLAROO (both in collision with US merchant ships).

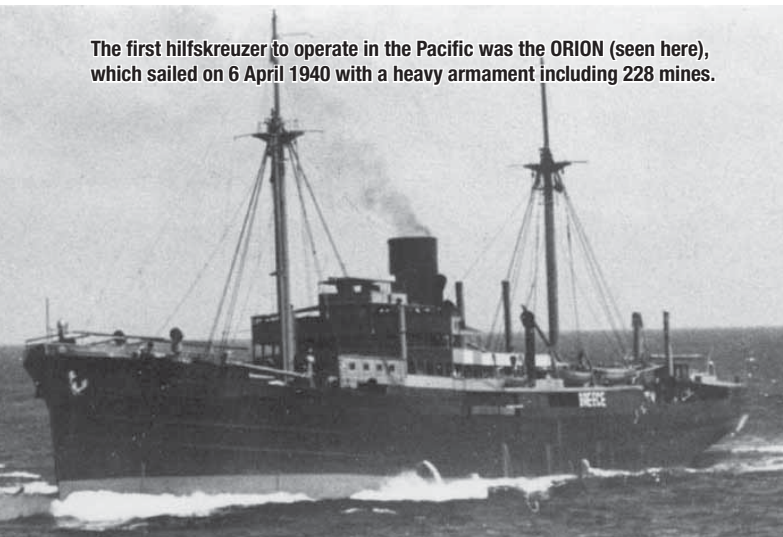
In 1939, the New Zealand Government ordered three training vessels from Britain. These Bird class minesweepers were not commissioned until late 1941 and were to see much active service in the South West Pacific. There they sank the Japanese submarines I-1 and I-17, with MOA becoming a war loss following a Japanese air attack in the Solomon Islands. Four Isles class trawlers under construction for the Admiralty were offered to the New Zealand government and after delivery in 1942 these coal burners served mainly in local waters. A further eleven Castle class minesweeping trawlers were built in New Zealand shipyards for coastal and inshore duties.

With typical efficiency, the German Navy had made pre-war plans to undertake long range raiding operations using panzerschiffe (pocket battleships) and Hilfskreuzer. The Hilfskreuzer were also tasked with laying minefields to disrupt and sink allied shipping around the globe.

The German Hilfskreuzer (auxiliary cruiser) PRINZ EITEL FRIEDRICH after being interned in the US.



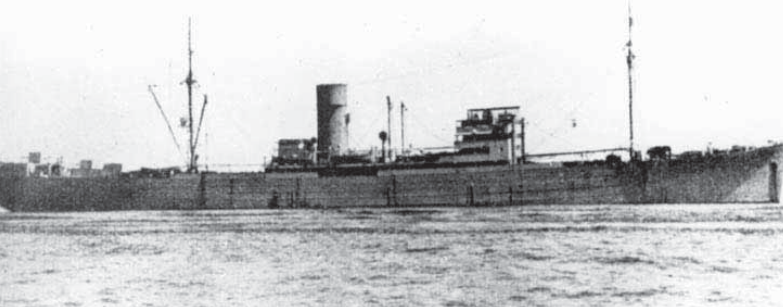
The first Hilfskreuzer to operate in the Pacific was the ORION (seen here), which sailed on 6 April 1940 with a heavy armament including 228 mines.



The first Hilfskreuzer to operate in the Pacific was the ORION, which sailed on 6 April 1940 with a heavy armament including 228 mines. After rounding Cape Horn, the ORION arrived in New Zealand waters on 13 June with orders that all her mines be laid in the approaches to Auckland. The first barrage was laid between Great Mercury Island and Cuvier Island with a second barrage being laid across the eastern entrance to the Colville Channel between Cuvier Island and Great Barrier Island. The third and largest barrage was laid across the entrance to the Hauraki Gulf from the northern tip of Great Barrier Island, then arcing around the Moko Hinau Islands to end some eight kilometres off the Northland coast.

The minefield's first victim was the large passenger liner *Niagara* outward bound from Auckland for Suva, Honolulu and Vancouver. Early in the morning of 19 June 1940 the *Niagara* reported an explosion in the No. 2 hold. The liner sank shortly afterward but fortunately with no loss of life. Lost with the *Niagara* was a shipment of gold bullion valued at two and

The most successful of the World War II German Hilfskreuzers was the PINGUIN. This raider sailed from Bremen on 22 June 1940 with 300 mines.



a half million pounds (\$5,000,000). Most of this was secretly recovered during the war by an Australian led salvage team.

After sinking the steamer *Turakina* in a one-sided engagement off Cape Egmont, the ORION sailed south of Australia to lay a dummy minefield off Albany WA. It was proposed to use five empty steel beer kegs as fake drift mines but this not so bright idea came to grief after a small explosive charge accidentally detonated killing one crew member and seriously wounding two others. The ORION eventually reached Bordeaux on 23 August 1941 after sinking or capturing 9.5 ships (7 shared with the raider KOMET) with a further two victims sunk by mines.

The most successful of the World War II Hilfskreuzers was the PINGUIN. This raider sailed from Bremen on 22 June 1940 with 300 mines and after successfully avoiding the Royal Navy blockade commenced raiding operations in late July. On 7 October the PINGUIN captured the Norwegian motor tanker *Storstad* in the Indian Ocean and this vessel, renamed

PASSAT, was converted into an auxiliary minelayer. The two ships then successfully laid a series of small minefields around the south east of Australia (Table 2).

PASSAT's minefields were responsible for the loss of the merchant ships *Cambridge* and the *City of Rayville*, the first US vessel to be sunk during the war. The minefields laid by PINGUIN accounted for the coaster *Nimbin* and seriously damaged the steamer *Hertford*. An indirect casualty of the minefields was the auxiliary minesweeper GOORANGAI which went down with all hands after colliding with the steamer *Duntroon* in Port Phillip Bay.

PINGUIN's greatest success was the capture of a Norwegian whaling fleet in Antarctic waters in January 1941. Three factory ships and eleven whale catchers were seized of which one, *Pol IX*, was retained as a tender. The PINGUIN met her end on 8 May 1941 when she was sunk by the heavy cruiser HMS CORNWALL.

The minefields on both sides of the Tasman were progressively cleared but not without incident. While engaged on mine clearance operations, the auxiliary minesweeper PURIRI struck one of ORION's mines on 14 May 1941 and sank immediately with the loss of five lives.

Exactly 24 years after WOLF had laid her mines, two further minefields were laid in New Zealand waters (Table 3). The perpetrator was the auxiliary minelayer ADJUTANT (ex *Pol IX*) which was now a consort of the Hilfskreuzer KOMET. These were magnetic ground mines which KOMET had originally intended to lay off Rabaul. The mines were probably defective and remain where there were laid to this day. ADJUTANT was experiencing major engine trouble and after rejoining KOMET on 1 July north of the Chatham Islands, the little minelayer was duly scuttled.

Only one Hilfskreuzer was sunk in Australian or New Zealand waters during World War II. This was the KORMORAN which carried 320 mines. The KORMORAN had intended to lay mines off Shark Bay when it was intercepted by HMAS SYDNEY on 19 November 1941. In the ensuing action, the SYDNEY was tragically lost with all her crew and the KORMORAN eventually sank after being set on fire and her mines blew up.

Japan entered the war with only four specialised minelaying submarines of the KRS type. These vessels, based on the surrendered German U-125 provided to Japan after World War I, could carry 42 mines as well as 12 torpedoes. All were to be employed on mine laying operations in northern

Only one Hilfskreuzer was sunk in Australian or New Zealand waters during World War II. This was the KORMORAN which carried 320 mines.



Australian waters and the first mines were laid off Darwin by the I-121 and I-122. I-121 and I-124 next laid mines at the western entrance to the Clarence Strait while the I-123 mined the entrance to Torres Strait. It was during these operations that the I-124 was sunk by the minesweepers DELORAINIE, KATOOMBA and LITHGOW.

On 17 January 1942, the US heavy cruiser HOUSTON sighted two submarines close to Darwin and the three minesweepers were dispatched

HMAS SHOALWATER. She was one of only two Bay class inshore mine hunters. Six were to be built. (RAN)



to find and sink these boats. Three days later, the DELORAINE was attacked by a torpedo which it managed to evade. DELORAINE depth charged the submarine and was later assisted in this by the other two minesweepers and the US destroyer EDSALL. There are no recorded losses arising from the mines laid by the four Japanese submarines.

As Japan swept southward, anti-invasion defensive minefields became a priority on both sides of the Tasman. The war was brought home to Australia with the Darwin air attack on 19 February 1942 and the midget submarine attack on Sydney Harbour on 31 May 1942. Commissioned in June 1941, the auxiliary minelayer BUNGAREE was tasked with laying minefields in northern Australian waters and together with the mines base ship ATREUS and the controlled minelayer ALSEY. BUNGAREE also laid mines in New Zealand's Hauraki Gulf. The loss of five aircraft carriers in the Coral Sea and Midway battles halted Japan's southern expansion and the expected invasions never occurred.

As the war progressed, a new threat developed from the minefields laid by ORION, PINGUIN and PASSAT. Many of these mines broke free from their moorings and became a hazard to shipping. Several of the mines laid in Australian waters drifted across the Tasman Sea to the west coast of New Zealand from as far north as Hokianga Harbour to Stewart Island in the south. A mine found near the small North Taranaki town of Mokau was rendered safe and is now preserved as a memorial. The plaque reads "Let this German Mine found December 2nd 1942 remind us in the days of peace, without vision the people perish".

THE POST WAR YEARS

Following the cessation of hostilities, requisitioned ships were returned to their owners and mine warfare assets were substantially reduced. During post war mine clearance operations, the

minesweeper WARRNANBOOL struck a mine on 13 September 1947 near Cockburn Reef off the northern Queensland Coast. Four sailors were killed and WARRNAMBOOL sank shortly afterwards. As there is no record of Japanese mines being laid in this area, this loss is almost certainly attributable to a defensive minefield laid by BUNGAREE.

Ten Bathurst class were eventually retained as minesweepers by the RAN and four were gifted to the RNZN retaining their RAN names. To replace the Bathurst class, six Royal Navy Ton class coastal minesweepers were purchased by the RAN in 1961. The CURLEW, GULL, HAWK, IBIS, SNIPE and TEAL had lengthy careers and together with their RNZN sister ships HICKLETON and SANTON saw active service on anti infiltration patrols in Malaysian and Borneo waters during Confrontation with Indonesia.

The Ton class vessels were eventually replaced by the inshore minehunter catamarans RUSHCUTTER and SHOALWATER. Only two of a projected six vessels were built and the auxiliary minesweepers BANDICOOT, WALLAROO, BROLGA, BERMAGUI and KORAAGA were purchased after commercial careers to make up the shortfall.

From January to May 1991, the RAN deployed Australian Clearance Diving Team 3 (AUSCDT 3) to the Middle East in support of Operations Damask and Desert Storm. Much valuable experience was gained in the clearance of Iraqi mines and other ordnance. The RAN mine countermeasure capability now consists of six coastal minehunters with the HUON entering service in 1998 and sister ships HAWKESBURY, NORMAN, GASCOYNE, DIAMANTINA and YARRA progressively thereafter.

In 1952, the RNZN tug MANAWANUI (I) was converted for diving training work and served in this role until 1978. She was replaced as a diving tender by the locally built MANAWANUI (II) in 1979 but this vessel had limitations with her diving facilities and range of operations.

On 10 July 1985, French DGSE agents sank the Greenpeace ship *Rainbow Warrior* in Auckland Harbour with limpet mines. The RNZN Operational Diving Team (ODT) operating from the diving support barge PATIKI salvaged the Greenpeace vessel which, being beyond repair, was later sunk as a dive wreck.

In 1988 the North Sea diving ship *Star Perseus* was purchased and commissioned as the MANAWANUI (III). The former MANAWANUI was renamed KAHU and became a training vessel.

The four inshore patrol craft MOA, KIWI, WAKAKURA and HINAU attached to the RNZNVR Divisions were subsequently fitted with towed side scan sonar to give them a mine detection capability. Today, the RNZN Diving & MCM Force consists of the MANAWANUI, KAHU (which has now reverted to her original role) and the ODT.

CONCLUSION

Mine warfare has been and will continue to be a significant maritime threat to Australia and New Zealand. The geographic remoteness of both nations particularly lends itself to mine laying activities either by submarine or surface vessel and such threats can develop quite quickly.

It is pertinent to note that while Australia and New Zealand tend to look northward for any future potential maritime threats, past experience is that mine laying incursions have mainly emanated from the "Raider Route" below the latitude of 45 degrees. It is from this empty stretch of ocean that mine laying naval auxiliaries in merchant livery or ships taken up from trade, such as factory trawlers, can operate in relative obscurity.

While influence mines of increasing sophistication are now the norm, modern variants of the original 1908 Russian moored contact mine can still be lethal to shipping. It has long been an axiom that every ship can be a minesweeper; once. Continued vigilance is required to negate that adverse possible outcome in Australian and New Zealand waters.

The modern Huon class mine hunter HMAS DIAMANTINA (John Mortimer)



TABLE 1		WOLF
Date	Place Mined	Mines Laid
Night of 25/26 June 1917	Between Cape Maria van Diemen and Three Kings Islands (NZ)	25
Night of 27/28 June	Farewell Spit (NZ)	35
Night of 3/4 July	Gabo Island (Cape Howe)	17
Total mines laid		77

TABLE 2		PINGUIN		PASSAT	
Date	Place Mined	Mines Laid	Place Mined	Mines Laid	
Night of 28/29 October 1940	Sydney - Newcastle	40 with 48 hours delayed action			
Night of 29/30 October			Banks Strait	30 with 48 hours delayed action	
Night of 30/31 October			Eastern Entrance Bass Strait	40 with 48 hours delayed action	
Night of 31 October 1 November	Hobart	40	Western Entrance Bass Strait	40	
Night of 6/7 November	Spencer Gulf	40			
Total mines laid		120		110	

TABLE 3		ADJUTANT
Date	Place Mined	Mines laid
Night of 24/25 June 1941	Lyttleton (NZ)	10
Night of 25/26 June	Wellington (NZ)	10
Total mines laid		20

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

The Navy League:

- Believes Australia can be defended against attack by other than a super or major maritime power and that the prime requirement of our defence is an evident ability to control the sea and air space around us and to contribute to defending essential lines of sea and air communication to our allies.
- Supports the ANZUS Treaty and the future reintegration of New Zealand as a full partner.
- Urges close relationships with the nearer ASEAN countries, PNG and South Pacific Island States.
- Advocates the acquisition of the most modern armaments, surveillance systems and sensors to ensure that the Australian Defence Force (ADF) maintains some technological advantages over forces in our general area.
- Believes there must be a significant deterrent element in the ADF capable of powerful retaliation at considerable distances from Australia.
- Believes the ADF must have the capability to protect essential shipping at considerable distances from Australia, as well as in coastal waters.
- Supports the concept of a strong modern Air Force and a highly mobile well-equipped Army, capable of island and jungle warfare as well as the defence of Northern Australia and its role in combatting terrorism.
- Advocates that a proportion of the projected new fighters for the ADF be of the Short Take Off and Vertical Landing (STOVL) version to enable operation from suitable ships and minor airfields to support overseas deployments.
- Endorses the control of Coastal Surveillance by the defence force and the development of the capability for patrol and surveillance in severe sea states 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 support the ADF and to ensure the carriage of essential cargoes in war.

As to the RAN, the League:

- Supports the concept of a Navy capable of effective action off both East and West coasts simultaneously and advocates a gradual build up of the Fleet and its afloat support ships to ensure that, in conjunction with the RAAF, this can be achieved against any force which could be deployed in our general area.

- Believes that the level of both the offensive and defensive capability of the RAN should be increased, and welcomes the decision to build at least 3 Air Warfare Destroyers (AWDs).
- Noting the increase in maritime power now taking place in our general area, advocates increasing the order for AWDs to at least 4 vessels.
- Advocates the acquisition of long-range precision missiles and long-range precision gunfire to increase the RAN's present limited power projection, support and deterrent capabilities.
- Welcomes the building of two large landing ships (LHDs) and supports the development of amphibious forces to enable assistance to be provided by sea as well as by air to island states in our area, to allies, and to our offshore territories.
- Advocates the early acquisition of integrated air power in the fleet to ensure that ADF deployments can be fully defended and supported by sea.
- Supports the acquisition of unmanned surface and sub-surface vessels and aircraft.
- Advocates that all warships be equipped with some form of defence against missiles.
- Advocates the future build-up of submarine strength to at least 8 vessels.
- Advocates a timely submarine replacement programme and that all forms of propulsion be examined with a view to selecting the most advantageous operationally.
- Supports continuing development of a balanced fleet including a mine-countermeasures force, a hydrographic/oceanographic element, a patrol boat force capable of operating in severe sea states, and adequate afloat support vessels.
- Supports the development of Australia's defence industry, including strong research and design organisations capable of constructing and maintaining all needed types of warships and support vessels.
- Advocates the retention in a Reserve Fleet of Naval vessels of potential value in defence emergency.
- Supports the maintenance of a strong Naval Reserve to help crew vessels and aircraft and for specialised tasks in time of defence emergency.
- Supports the maintenance of a strong Australian Navy Cadets organisation.

The League:

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

Indian and US Naval units exercising together in the Indian Ocean. From front to back; the Kashin class destroyer INS RANA, the Ticonderoga class cruiser USS CHANCELLORSVILLE, the frigate INS GOODAVARI and Arleigh Burke class destroyer USS DECATUR. (USN)



HMAS BALLARAT in New Zealand. (RAN)



The JMSDF's newest Aegis equipped destroyer, the improved Kongo class ship ASHIGARA. (USN)



South Korea's newest Aegis equipped destroyer, the KDX-III class destroyer KING SEJONG. It is named after the Joseon Dynasty monarch, who helped create the Korean alphabet in the 15th century.

