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THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

AIR 9000 PHASE 8 THE SEAHAWK REPLACEMENT

RAN SEA POWER CONFERENCE 2010

HMS AMETHYST AND HMAS SHOALHAVEN LUCKY ESCAPE

THE SINKING OF FORCE Z, TWILIGHT OF THE BATTLESHIP

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THE NAVY LEAGUE OF AUSTRALIA

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Volume 72 No.2

THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

Front cover: The upgraded FFGs MELBOURNE(left) and SYDNEY (Right) at Fremantle. Chief of Navy has 'accepted' the FFGs from the DMO to enable further testing. (Ian Johnson)

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PAPER TIGER – JUST ADD WATER

For some time *THE NAVY* has been emphasising the need for organic close air support for embarked troops on the new Canberra class LHDs when they enter service. Experience in Afghanistan to date has shown that despite the fact that it is a low intensity counter-insurgency operation against non-state actors, close air support is still essential.

Take for instance the current deployment of eight RAF Tornado GR.4 aircraft to Kandahar. From July 2009 to January 2010 these eight aircraft flew over 400 sorties totalling over 1,500 flying hours. Of these 400 sorties over 100 were close air support missions for troops 'in contact'. If this is the sort of effort required against non-state actors what will the ADF require when its LHDs put troops into harm's way of a state based enemy?

At the recent Sea Power conference in Sydney nearly the entire Australian content of the conference was made up of LHD presentations and the impact that the LHDs are going to have on the ADF. Unfortunately no one addressed the topic of immediate close air support requirements of the embarked land force, or seemingly wanted to.

One of the many presentations was from Army's aviation group and their preparations for the arrival of the LHD. It was said that the introduction into service of the MRH-90 transport helicopter was proceeding well with the aircraft well suited to amphibious operations, although its lack of automatic blade folding rotors is a 'concern' for Navy. Army realises too that the only asset that the embarked land force has at its disposal for the close air support role is its Tiger ARH (Armed Reconnaissance Helicopter), although calling it a close air support asset is a complete departure from its concept of operations of armed reconnaissance.

The Tiger ARH is a two-seat attack helicopter acquired under Project Air 87 that is also used by France, Germany and Spain and was designed for land-based European theatres of operation. Australia ordered 22 Tigers based on European variants. The Australian version uses a trainable 30mm cannon, 70mm unguided rockets in pods of seven and nineteen, and the US Hellfire II laser guided missile. The usual load of Hellfire is four, but eight can be carried at the expense of range and performance. The Tiger was purchased to replace the Vietnam-era Kiowa light observation helicopter and the UH-1 Iroquois gunship in army service.

During the question and answer session for Army Aviation's presentation it transpired that the Tiger ARH is not up to the task of supporting troops ashore from the LHD. The Tiger, the presenter said, is not marinised, particularly against the effects of salt spray. Its undercarriage and tie down points are unsuitable for deck operations. Its rotor blades do not fold and nor has it been tested at sea by the ADF using legacy platforms such as KANIMBLA and MANOORA to discover any other limitations. One could assume from this revelation that left in its current state the Tiger will not operate from the LHDs but rather be 'sea lifted' to the area of operations and then disembarked. This somewhat negates the need for a large helicopter support ship such as an LHD from which to conduct amphibious assaults from. The Tiger's responsiveness to calls for support would also have to be questioned.

There is no doubt the maker of the Tiger could, with the appropriate financial input, provide a maritime upgrade kit for some of the aircraft's deficiencies. Currently, the French are conducting sea trials of the Tiger and may have already realised many of its maritime deficiencies. Hopefully from this they will provide the funds for marinisation development, but then again, they do not need the Tiger for close air support from their LHDs like Australia will. For that supporting role the French have the nuclear powered aircraft carrier CHARLES DE GAULLE with its 4th generation supersonic Rafale strike fighters. The Spanish, while having the same class of LHD and the Tiger ARH, also have an aircraft carrier to support amphibious operations and are currently examining the use of STOVL JSF from their LHD to support their troops ashore (as Australia should be).

So at this stage it appears the ADF will be left without an effective embarked close air support asset when it deploys a land force far from its RAAF airbases (which is the key reason for having an LHD capability in the first place). Why is *THE NAVY* the only concerned party discussing this issue?

An Army Tiger ARH. The Tiger is currently unsuited for operations from the new Canberra class LHDs. (Defence)

Dear Editor,

I enjoyed your 'From the Crows Nest' in the last issue about the Bronco close air support aircraft and its potential for use from our new Canberra class LHDs. God knows our army needs real air support if going off shore more so than what can be provided by the Tiger recon helicopter.

Turboprop aircraft have provided excellent service in the close air support role for decades. They are significantly less maintenance intensive than a helicopter or fast jet; have higher availability rates; are cheaper to run and acquire; can be more persistent over the battlefield; are quieter and can thus surprise the enemy; have a lower IR signature and can usually take more battle damage than a helicopter (even the modern attack helicopters like the Apache or lesser Tiger). So your Bronco suggestion is a good one deserving of Defence attention (I bet it won't happen though).

What many probably don't know is that the RAAF has some experience with the OV-10 Bronco. At least 10 RAAF pilots flew the aircraft on combat missions during the Vietnam war. One pilot, Flight Lieutenant Chris Langton, was actually shot down in Vietnam while serving as a Forward Air Controller with the US Air Force near the Cambodian border. He and his observer ejected after the aircraft was hit by ground fire. They were picked up by a light observation helicopter.

Another of the pilots, Graham Neil, went on to the rank of Air Vice Marshall with another, Doug Riding, becoming Vice Chief of the Defence Force.

I also understand that one of the Broncos that our guys flew is currently in the Australian War Memorial Annex at Mitchell in the ACT.

So the link with the Bronco is certainly there for the ADF of today to rekindle the relationship.

Steve Bennet (via e-mail)

Dear Editor,

Having just read the article, *The Rationale for the RAN Offshore Combatant Vessel*, in the latest edition of *THE NAVY*, I must commend the author for his insightful look at this exciting future project.

As the Maritime Development Desk Officer for Project SEA 1180, I concur with his appraisal that the OCV offers potential to realise savings in through life costs, resources and improve capability through a flexible modular approach. Many of the concerns and issues touched on in the article have already been identified and will be further explored during the coming year through a series of studies designed to better understand what is needed in the future platform.

Without a doubt, the OCV concept presents a big challenge for Navy but also offers huge potential benefits that will drive cultural changes across the different specialisations. Navy has been engaged early in the project development cycle to understand and address any risks or issues as they arise.

Mr Thornton is right in his assertion that the OCV is one of the most creative and innovative ventures in naval capability ever undertaken by the RAN.

Yours Aye,
CMDR S. Dunne, RAN
Capability Development Group
CANBERRA

Dear Editor,

I refer to the recent spate of articles in the Fairfax press about waste expenditure by Defence.

I dare say that most people deprecate waste by any organisation for which they are contributing hard-earned cash (taxes in this case). However, I think we should not be too hasty to assume that any unusual expenditure is necessarily waste.

For example the SMH noted that: 'Senator Faulkner... said some of the contracts published by the Herald had been identified as legitimate, such as the hire of a Learjet which was ''in support of combat equipment testing". His department had previously failed to explain the expense.'

What that story failed to note was that Defence has been hiring Learjets since the 1970's for the calibration and exercising of air defence systems in the RAN for the simple reason that the leasing cost of so doing was less than the total cost of using other aircraft in the ADF inventory for the same task. The latter costs include the flight hours available for the aircraft over its life divided into the total cost of ownership to deliver those hours. And that is more expensive by a long way than a routine hire of a Learjet.

This approach also overlooks the further opportunity cost of the expenditure of the available aircraft fleet hours on non-combat missions leaving less hours available for their intended purpose.

So the hiring of the Learjets saved money and increased the benefits of aircraft in ADF inventory – definitely a win-win outcome. But as the Minister says, his department had failed to explain all of this. High time they did so, and as this case shows, there are valid and laudable reasons for some expenditure choices. What is missing is the articulation of the business cases for the expenditure in a form that can be read by the general public.

Chris Skinner – Sydney

A USAF OV-10 Bronco Close Air Support aircraft preparing for a mission. (USAF)

SEA POWER CONFERENCE

On the 27th, 28th and 29th of January 2010 the Royal Australian Navy Sea Power Conference was held at the Sydney Convention Centre, Darling Harbour.

The Conference was held in conjunction with the Pacific Maritime Congress and International Maritime Exposition. The Exposition occupied the exhibition halls adjoining the Convention Centre. The many displays in the Exposition were well worth a visit.

The Opening Ceremony heard speeches from Vice Admiral Russ Crane, Chief of Navy; Senator Faulkner, Minister for Defence; Mr John Jeremy, Chairman, International Conference Organising Committee; and Rear Admiral David Holthouse, Chairman, Maritime Australia Limited.

David Holthouse is a Vice-President of the Navy League and John Jeremy a member of the League Federal Council.

The Conference set out to discuss Combined and Joint Operations from the Sea.

The Royal Australian Navy is to receive three (maybe four) Air Warfare Destroyers and two large amphibious ships. The capability these ships will deliver will provide the Australian Defence Force with a greatly enhanced amphibious and expeditionary resource.

It was with the introduction of these vessels in view that the Conference looked at topics such as Operational Issues, Australian Amphibious Concepts and Amphibious Capability. Interesting international perspectives on amphibious operations were presented by British, New Zealand and Dutch representatives. Other speakers over the three days of the Conference came from China, the United States, Korea and Indonesia.

Rear Admiral Andrew Robertson has a full report on the Conference in this edition of *THE NAVY*.

I will not seek to duplicate Andrew Robertson`s report. There is, however, one comment I would like to make.

What was described as the Keynote Address was given by three people,

Vice Admiral Crane, Chief of Navy, Lieutenant General Gillespie, Chief of Army and Air Marshal Binskin, Chief of Air Force.

It was a delight to hear all three Service Chiefs speaking as one in support of Australia`s Maritime Strategy.

TS ANZAC

As is well known the Navy League has had a long association with Navy Cadets. For decades the League ran the Sea Cadets, as they were then called. When, in the early 1970s, it became apparent that the Sea Cadet Corps had become too large to be run by a voluntary organisation, arrangements were made for a merger with the then rather smaller Navy Cadets.

Although relinquishing responsibility for running the cadets, the League has continued to take a keen interest in their operations and welfare. This interest takes many forms including financial support, making representations on behalf of the Cadets and giving prizes and awards.

The premier award is the 'Navy League of Australia Efficiency Trophy' which is given each year to the Cadet Unit judged to be the best in Australia. The Trophy Shield is each year presented to the winning Unit by Chief of Navy.

The winning Unit for 2009 was TS ANZAC of Rockingham, Western Australia. Shortly before Christmas Chief of Navy, Vice Admiral Russ Crane, presented the 'Navy League Efficiency Trophy Shield' to TS ANZAC

The League offers its wholehearted congratulations to TS ANZAC.

Some of the many stands at Pacific 2010.

AIR 9000 PHASE 8
THE SEAHAWK REPLACEMENT

By Paul Johnstone

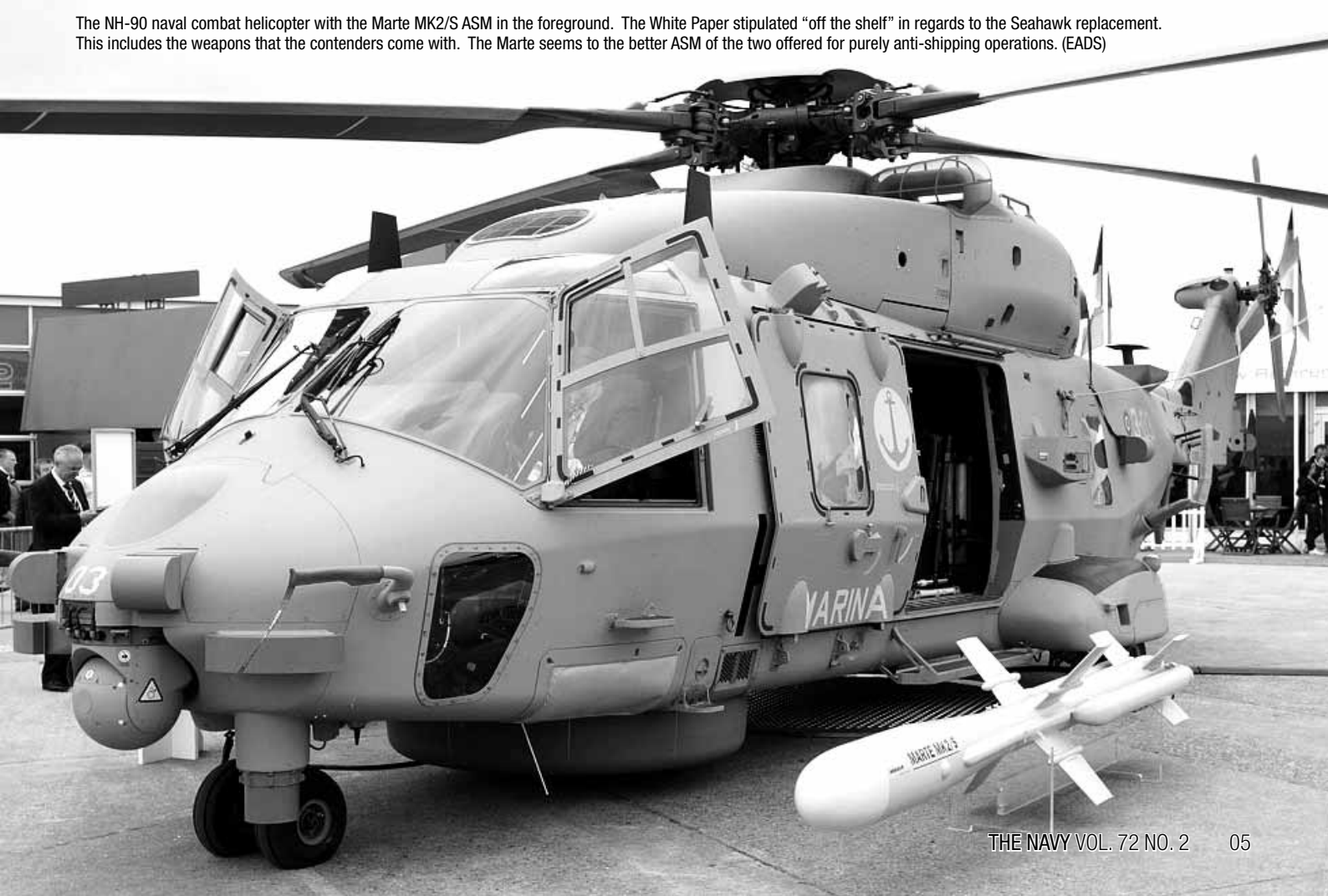
The recent Defence White Paper, *FORCE 2030*, formalised the replacement of the RAN's Seahawk helicopters with 24 MOTS (Military Off The Shelf) aircraft and stated that it be done as a matter of urgency given the extra strain placed on the Seahawks through the cancellation of 11 additional helicopters that were to have joined the fleet through the Super Seasprite project. The contest to supply new helicopters is now between an available helicopter that does not meet all the Navy's requirements, verses a not yet ready helicopter that surpasses them. Paul Johnstone reports.

The AUD$1.5 billion contract to supply the Navy with a Seahawk replacement is between the Sikorsky/Lockheed Martin Seahawk MH-60R (Romeo) and the NHI/Australian Aerospace NFH-90. Project AIR 9000 Phase 8 is expected to acquire at least 24 new naval helicopters to generate eight simultaneous flights at sea, setting the direction of ship based RAN Rotary capability for the next 30 years.

Small capable navies by experience find that operating a flight of one to two helicopters from destroyers and frigates often requires a considerable logistics effort. For every one helicopter stationed on a ship approximately three helicopters are required ashore to meet the demands of training, maintenance and other non operational deployments. What this means is that the current RAN force structure has been struggling to meet ship borne naval aviation requirements even before the commencement of this project.

Navy, severely strained by the cancellation of Project SEA 1411 (Super Seasprite), is keen to find a rotary solution that will be low risk and provide a ship based Anti-Surface Warfare (ASuW), Anti Submarine Warfare (ASW) and to some extent Search and Rescue (SAR) and Fleet Utility tasks, including boarding operations. The biggest question for decision makers is whether to embrace a well proven technology that is readily available or take a risk with a more expensive emerging very modern technology that may experience delay. The RAN wants the eventual winner of the contract to provide it with operational aircraft by 2014, to coincide with the scheduled

The NH-90 naval combat helicopter with the Marte MK2/S ASM in the foreground. The White Paper stipulated "off the shelf" in regards to the Seahawk replacement. This includes the weapons that the contenders come with. The Marte seems to the better ASM of the two offered for purely anti-shipping operations. (EADS)



introduction of the Project SEA 4000 Hobart class Air Warfare Destroyer.

Navy currently has six Eurocopter Squirrel AS-350BA, three Agusta A-109E 'Power', 16 S-70B2 Sikorsky Seahawks and six aging Sea King MK-50A - although upgraded they are now being replaced with a modern Australianised version of the NH-90 known as the MRH-90.

Whilst the NH-90 is flying it is only just commencing acceptance test and evaluation with several navies; namely the Dutch, French and Italian navies. This however, is expected to be achieved by late 2010. It is also in the process of being acquired by Finland, Germany, Norway, Portugal and Sweden. One argument against the NH-90 is that the Romeo version of the MH-60 Seahawk is already in-service with the USN providing low risk operationally reliable and proven ASuW and ASW data on performance. The Romeo is also cheaper.

One of the Navy's six new MRH-90 utility helicopters undergoing first of class flight trials onboard HMAS MANOORA. The NH-90 contender for AIR 9000 Phase 8 is approx 80% common to the Australian MRH-90. (Defence)

NH-90 NFH

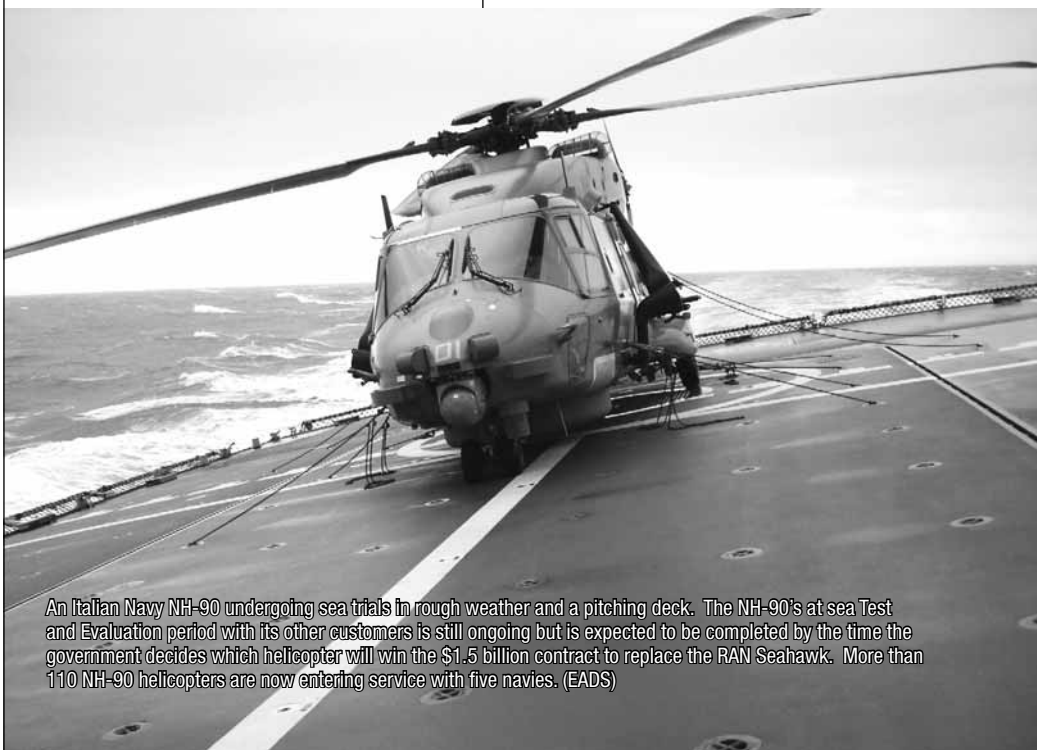
Known as the NATO Frigate Helicopter (NFH) this fly by wire, composite fibre, corrosion resistant aircraft shares 80% of its airframe and avionics with the MRH-90, of which 46 are entering service with the ADF. Australian Aerospace, a local subsidiary of Eurocopter/ EADS, has established a manufacturing support facility in Brisbane, Queensland. The Armed Reconnaissance Helicopter, or Tiger, for the Australian Army and the MRH-90 have undergone final assembly at this facility. An Australian Aerospace composites structure manufacturing facility at Brisbane Airport also produces Tiger ARH and NH-90 structural and non-structural components. Also manufactured at this site are composite components for the Eurocopter AS332 Super Puma helicopter, typically used in off-shore oil rig support roles. These various components are distributed through the global supply chain and the facility acts as a regional support and maintenance hub. This manufacturing activity is supported by a co-located advanced composites research centre which is undertaking research into improved methods of composites component manufacture. Local partnerships with business, government and the provision of traineeships and apprenticeships have already been established as part of this process and technology transfer. Selection of the NH-90 is expected to create 500 full time direct highly technical aviation jobs with a further 250 indirect jobs in Australia.

The NH-90 design provides for an ASuW, ASW, SAR and troop insertion role simultaneously. Large side doors and a rear ramp provide easy movement for a six man boarding party with no requirement for reconfiguration i.e. the ASW and ASuW configuration can remain fully in place. Whilst the external physical dimensions of the NH-90 are roughly the same as the Romeo, it has 60% greater floor area and 35% increased volume.

The ASW role is undertaken by a combination of passive and active submarine tracking and targeting sensors including the Thales Flash low frequency dipping sonar, passive and active sonobuoys and 360 degree radar mounted under the fuselage. The technical name for the low frequency dipping sonar is the Folding Light Acoustic System for Helicopters (FLASH) by Thales. The same dipping sonar as fitted to the rival bid Sikorsky MH-60 Romeo but is referred to as the AN/AQS-22. The acoustic processor that manages both dipping sonar and sonobuoy data on the NH-90 is referred to as TMS2000. All these sensors are fused into a common integrated picture for the aircraft's tactical coordination officer.

The weapons mix consists of two Eurotorp MU90 II Lightweight torpedos, already in service with RAN. Flex mount 7.62mm GPMG or 12.7mm/.50 cal machine guns can be operated from both side doors simultaneously. Currently two MBDA Marte Mk-2S ASMs (Anti-Ship Missiles) with a range in excess of 35 km are carried providing a true anti-ship capability whilst keeping the helicopter safely out of harm's way. EADS state that the open architecture of the NH-90 permits other weapon types to fitted however, this would contradict the MOTS requirement as stipulated in the White Paper. The MBDA Marte Mk-2S is a modern sea skimming, radar guided fire and forget ASM with a 150lb HE warhead. Already its developers are working towards the introduction of an Imaging Infrared System for improved guidance and a turbo jet engine extending its range of 100 km. This Marte Mk-2S has been specifically designed for the NH-90.

Having its design origins in the 90s not only is the NH-90 corrosion free but has incredibly



An Italian Navy NH-90 undergoing sea trials in rough weather and a pitching deck. The NH-90's at sea Test and Evaluation period with its other customers is still ongoing but is expected to be completed by the time the government decides which helicopter will win the $1.5 billion contract to replace the RAN Seahawk. More than 110 NH-90 helicopters are now entering service with five navies. (EADS)

A Dutch NH-90. Note the large door openings for boarding parties, SAR operations or dual door mounted machine guns. The NH-90 also has a rear ramp that can be lowered for easy access. (EADS)

strong composite fibres used in the construction designed with the latest crash safety in mind. The NH-90's ability to float in rough seas for up to 15 minutes after a crash is a significant advance in maritime helicopter technology. Ditching at sea and undertaking an emergency underwater ensuing escape is the nightmare of naval aviation. This is particularly relevant in the Tactical Transport role with heavy individual combat loads of modern land forces.

Whilst the NH-90 is only now just entering service with the Dutch Navy, it is a relatively mature platform that has undergone extensive flight and pre-operational tests and will also enter service with the French, Italian and Norwegian Navies during 2010. Worldwide there are 529 NH-90s and 111 NH-90 variants on order. One argument readily used against the NH-90 is that the Romeo version of the MH-60R Seahawk is already in-service with the USN providing operationally reliable and proven ASuW and ASW capabilities. However, the number of existing customers and growing number of orders indicate a distinct faith by many militaries in the capabilities and future of the NH-90.

SIKORSKY MH-60R SEAHAWK

The 'Romeo' version of the US Seahawk, as offered to Australia, has a variety of mission systems that have evolved over the last 12 years to meet modern naval requirements and the emerging threat environment. This evolution has been the result of in-depth exploration of emerging and future naval helicopter requirements. However, the Romeo is not just a combination of upgrades, rather a total new systems' refresh built upon successfully identified and trailed outcomes. The Romeo model is currently in service with three operational and two training squadrons with the USN, who are planning to purchase 300 airframes in total. The USN expects MH-60R to become the only ASW/ASuW combat platform organic to the USN's ships for the next 30 years.

The 'Romeo' weapons mix consists of eight AGM-114M Hellfire II missiles (as used on the Australian Army's ARH Tiger) with a range of up to 8 kilometres and two Mk-54 lightweight torpedoes, or a missile and torpedo mix. Either a 7.62mm or 12.7mm/.50 cal machine gun can also be mounted on the right hand door of the Romeo. Whilst the RAN has moved

A USN SH-60R. The Romeo is able to take two torpedoes and eight Hellfire missiles simultaneously. (USN)

towards the Eurotorp MU90 MK II Lightweight Torpedo and has a stock of AGM-119 Penguin M2 Mod 7 ASMs it has not specified that these be integrated as part of the AIR 9000 Phase 8. Lockheed Martin/Sikorsky insist that given the open architecture design of the MH-60R these could be integrated if required by Defence/RAN, but at cost and with added integration risk as the USN 'Romeo' does not use these weapons.

For ASuW the USN 'Romeo' is equipped with the relatively short range and small punch laser guided Hellfire II as this weapon is viewed in USN doctrine as only one layer of defence, others consisting of carrier borne fast jets etc. The 'Romeos' competitor points out the limited range of the Hellfire II and the need for constant illumination of the target negates it as a true ASuW strike capability. The Hellfire II integration on the 'Romeo' was chosen by the USN to provide force protection and offensive capability in the littoral environments that require positive identification and positive control. This is particularly relevant against small, fast boat Boghammar type threats as used by terrorists, pirates, militants and during the Tanker Wars of the 1980s. The application of Hellfire provides a mix of warhead types and up to eight missiles may be carried on the MH-60R at one time.

The MH-60R is equipped with the AN/AQS-22 airborne low frequency dipping sonar linked to the AN/UYS-2A Enhanced Modular Signal Processor for interpreting acoustic data provided by the sonar and sonobuoys. ASW/ASuW operations are assisted with the AN/APS-147 multimode surface search radar which is located in a button fairing under the nose of the aircraft providing 360 degree coverage. Aboard the 'Romeo', the mission computers build and integrate situational pictures of the surface and subsurface domains from the sensor data pouring into the aircraft. The data is displayed as actionable information and knowledge to the crew of three and can be shared with the

An Italian HN-90 with dipping sonar deployed. Both Air 9000 Phase 8 contenders have the same dipping sonar. This pivotal ASW capability has been missing in the RAN for far too long.

An SH-60R Seahawk about to land aboard ship. The RAN is very familiar with the Seahawk having operated 16 for many years with a perfect safety record. (USN)

host ship via data link. This approach not only reduces workload, but also allows the crew and the ship(s) it is protecting to spend less time analysing data and more time prosecuting the target.

Since declaring the MH-60R operational in December 2005, the USN has continued to invest in technological improvements to the communications, navigation and weapons systems. These upgrades include:

- Link 16 data link: allows exchange of situational awareness information and coordination of weapons engagement with other friendly forces.
- Ku-Band data link: a broadband air-to-ship pipe that allows the aircraft to stream sensor data to the ship (the ship can see what the helicopter sensors see).
- Ground proximity warning.
- Second weapons pylon: allows carriage of four additional Hellfire missiles or torpedoes.
- SATCOM and GPS enhancements.
- Upgrade of the Electronic Support Measures (ESM) processor.
- Added a point and click man/machine interface to the digital cockpit.
- Upgraded the acoustic suite with additional processing capability while reducing weight.
- Digitized the sonobuoys receivers.
- Currently flight testing enhanced periscope detection capability on the multi-mode radar.

The USN has implemented an obsolescence management programme with industry to ensure critical processors and other subsystems on the aircraft can continue to accept new technology over the 30-year life of the weapon system. This is an important initiative that demonstrates the seriousness of the USN to maintain the MH-60 'Romeo' Seahawk through to at least 2040.

If Australia decides upon the 'Romeo' the helicopters will not be manufactured in Australia. The relatively small purchase numbers for the RAN coupled with an already well established production and testing facility in the USA makes any manufacturing move from the US unnecessary and possibly complicates a system that already works well. However, a proposed logistics support, maintenance and upgrade facility at HMAS ALBATROSS in Nowra (home of the Fleet Air Arm) would add about AUD$300 million into the local community over 10 years and create approximately 150 jobs. Traineeships and apprenticeships are part of this process and industrial partners such as CAE, General Electric and Raytheon Australia would also have roles. Sikorsky claims that the first aircraft could be delivered to the RAN by late 2011and if required a different ASM capability could be integrated by 2012 (although the RAN would have to accept the additional developmental risk).

Lockheed Martin/Sikorsky state that the 'Romeo' is not just an upgraded airframe of earlier versions of the Seahawk and it still has room to grow. Since the USN declared the 'Romeo' operational in late 2005, the service has continued to invest in the platform with numerous improvements to the communications, navigation and weapons systems. Among them is the integration of Link-16 tactical data link. Ongoing enhancements to the multi-mode radar and air-to-ship broadband data link are coming online.

CONCLUSION

The RAN desperately requires a modern, capable, ship borne rotary-wing capability that is able to undertake the future challenges of ASW and ASuW. Both airframes with their associated support and capabilities have real positive pathways for the RAN whilst also having issues and limitations. However, the RAN has made the correct decision to shortlist these two types from all other potential contenders. The challenge now is not to rush the decision, dumb down the requirements for expediency or turndown uniquely Australian requirements essential to meet regional and tactical operation demands. The old adage 'once bitten twice shy' associated with the government and public demand to mitigate risk appears to be dominating the decision making process.

Project Air 9000 seeks to rationalise the types of rotary airframes within the inventory of the ADF to approximately four types. Whatever decision is ultimately undertaken it will dominate RAN ship based naval aviation for the next 30 years. A hefty responsibility for the decision makers to make that needs to be tactically shrewd and responsive rather than politically motivated, especially in an election year.

An-SH-60R Seahawk firing a Hellfire missile. The Hellfire is a laser guided air to surface missile with a range of approximately 8kms. Against smaller craft such as speed boats it is the superior air-to-surface missile. (USN)

RAN SEA POWER CONFERENCE 2010

By Rear Admiral Andrew Robertson, AO, DSC, RAN (Rtd)

The sixth biennial Sea Power Conference hosted by the Sea-Power Centre in Canberra, took place at the Convention and Exhibition Centre, Darling Harbour Sydney from 27 to 29 January 2010. The theme of the Conference was "Combined and Joint Operations from the Sea". Federal Vice-President of the Navy league, Andrew Robertson filed this report.

The event was held as part of the biennial Pacific Maritime Congress and Exposition, and involved two other major events: the Pacific 2010 International Maritime Conference (hosted by Engineers Australia, the Royal Institution of Naval Architects, and the Institute of Marine Engineering, Science and Technology) and the Pacific 2010 International Maritime Exposition, conducted by Maritime Australia Limited.

The event has become one of the most important maritime conferences taking place in the Indo/Pacific region and is always well attended by senior officers from many countries. This year, as well as the Premier of NSW and some Ministers; Australia's Minister for Defence; the Minister for Defence Science, Material and Personnel; and the Chiefs of Navy, Army, and Air Force; some 28 nations sent delegates. These included a number of Chiefs of Navy; the Secretary of the US Navy; the Commander of the US Pacific Fleet (and 10 other USN Admirals); the Commandant General of the British Royal Marines; the US Commander of the 111th Maritime Expeditionary Force in Okinawa and Japan; and Admirals from many other countries including Japan, China and India, and senior officers from the US and Philippines Coast Guards.

VADM Russ Crane AO, CSM, RAN, the Chief of Navy, together with Mr John Jeremy – Chairman of the International Maritime Conference Organising Committee, and RADM David Holthouse AO RAN (Rtd) – Chairman Maritime Australia Ltd, gave opening remarks and introduced Senator the Hon John Faulkner who officially opened the Conference.

This was the 6th Pacific Congress to be mounted in Sydney. Some 406 companies and organisations from Australia and many countries in Europe and North America were exhibiting and there were 136 delegations from 30 nations represented. It was expected that over 10,000 people would visit the Exhibition. There were over 1,150 delegates registered for the Sea Power Conference and 360 for the International Maritime Conference.

The Premier of NSW, the Hon Kristina Keneally MP, welcomed all to the conference, and then unveiled a new plan for a Maritime Defence Hub in NSW using key maritime defence sites such as Sydney, Newcastle and Nowra to target the $300 billion Commonwealth investment in the nation's defence industry. She stated that all the major defence prime contractors operate in NSW, which has the largest supply of skilled workers including the largest concentration of engineering professionals. The first step in the plan was the establishment of the Air Combat Capability Hub in Newcastle, which will see NSW play a central role in the delivery of new national aviation technology including the Joint Strike Fighter. Boeing would provide support for the new Wedgetail aircraft based at Williamtown.

The Minister for Defence, Senator Faulkner, spoke of the importance of the ocean around Australia which has shaped, and continues to shape, our nation. He stated that "if the most basic interest of any nation is the deterrence of armed attack, that interest demands the ability to achieve and maintain superiority and control of the oceans around Australia and the air above them".

He then outlined Australia's Maritime Strategy as in the Government's 2009 Defence White Paper and the considerable development of the Navy now in train, including the three Air Warfare Destroyers (AWDs), and the two Landing Helicopter Docks (LHDs) capable of landing and supporting over 2,000 personnel with their equipments and supplies. He outlined the decisions to acquire eight new Future Frigates, 20 multipurpose "offshore combatants", 12 new submarines (including the nature of the required design capability being examined by the US RAND Corporation), new helicopters, and new projects to develop ADF network-

(from left to right) Chief of Navy, VADM Russ Crane, AO, CSM, RAN, and RADM David Holthouse, AO RAN (Rtd) at the opening of the Sea Power conference. (Defence)

centric warfare capabilities.

Measures introduced by the New Generation Navy projects have helped to improve the personnel needs of the RAN, with recruitment and retention rates improving.

At the higher level he spoke of the new command structure comprising the Navy Strategic Command responsible for capability management, engineering, and people, and the Fleet command, responsible for Navy's capability to meet operational requirements as well as both individual and collective force training.

The Minister concluded with a forthright statement on the requirement for strong, flexible, versatile, integrated, state of the art maritime capability and the government's determination to build it.

The keynote address was given by Vice-Admiral Crane who called on the Chief of Army Lt Gen Ken Gillespie AO, DSC, CSM, and the Chief of Air Force Air Marshal Mark Binskin AM to join him and to outline what their services will bring to the joint force and what challenges they face to realise the vision of the Defence White Paper.

He spoke of the Navy's exciting future with a range of ships coming into service. The rise of non-conventional threats such as terrorism and the proliferation of weapons of mass destruction had added to traditional military threats. Australia needed to be prepared to conduct a range of responses in the maritime domain and to face these challenges independently or in conjunction with others.

Admiral Crane stated that the fundamental premise of the White Paper was consistent with the guiding principle of maritime doctrine – that maritime forces exist to establish sea control in order to conduct maritime power projection and to permit the use of the sea by military, commercial and private vessels. Australia would continue to be critically reliant on sea transport for its growing trade, much of which will pass through the entry ways into the Indian Ocean, including the Red Sea, Strait of Hormuz and the Malacca Strait. We would retain out strong links with Europe and the US so events far from Australia will continue to have the potential to affect us.

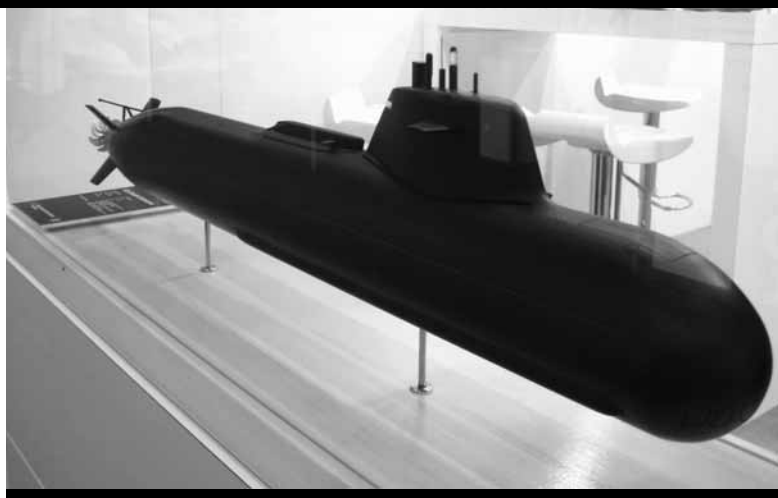
After covering the Navy's role in assisting in humanitarian aid following disasters in Samoa, Tonga, The Solomon Islands, Kiribati, the Marshal Islands, PNG, and Padang in Indonesia and Australia's responsibility for four percent of the world's ocean areas, Admiral Crane moved to the question of maritime power.

A recent think-tank report had argued that despite the oceans being central to our future prosperity and security, Australia as a nation had not developed as a maritime power historically, and not been a country that uses the sea to promote our national interest. He contended that the Australian era of "sea blindness" – the unwillingness or inability of the majority to acknowledge the importance of the oceans to the nation's prosperity and security –was drawing to a close and that the capability forecast in the White Paper was a potent indicator of the importance of the sea.

The future ADF amphibious capability would be a truly joint capability. The new landing ships (LHDs) would have a significant number of soldiers and Air Force personnel permanently posted to them and there was a joint aspiration to have landing force elements embarked whenever a LHD put to sea.

The Chief of Army, Lt General Gillespie, strongly supported the concept of combined and joint operations from the sea. He outlined the changes the Army was now facing including a period of major re-equipping with new armoured and unarmoured vehicles, artillery, helicopters and communications. The Army faced a large cultural and doctrinal change and was currently engaged in a broad-based debate about what change is required to maximise on our emerging amphibious capability.

The ability to project military power throughout our region and beyond, by deployment and sustainment from the sea, places land force maritime



Submarines seemed to be the flavour of many international stands at this year's Pacific 2010 Maritime Exhibition. This model is of the recently successful Swedish submarine contract winner by Kockums. The model depicts the A26 design.

Two models depicting the French Barracuda class SSN (foreground) and the successful Scorpene SSK. 12 Barracuda SSNs built by France could potentially be cheaper than Australia's technically challenging diesel electric submarine project SEA 1000.

A full scale mock up of a new Swedish VTUAV (Vertical Takeoff Uninhabited Aerial Vehicle) currently undergoing trials in Sweden.

manoeuvre in the littoral environment as a key component of future ADF capability. This will be possible without depending on allies providing the essential transport and support.

General Gillespie covered various possibilities in the Command and Control composition, and location of forces needed for amphibious operations. He outlined the major training co-ordination and logistic requirements to be met.

Shortly the Army would have 10 Battle Groups and a Commando Regiment and was currently analysing how best to achieve a trained Amphibious Ready Group, taking into account British and US experiences. He favoured providing one 'on-line' Battle Group at the same level of expertise as our coalition partners.

The notion that Army only uses Navy for sea-lift and Airforce for airlift must be changed. The Army needs to learn how to live, deploy, operate in, and operate from, the LHDs to maximise government's investment in this capability.

In concluding the Chief of Army stated, inter alia, that "our Army does not want to be called Marines, but because of its size and structure it needs to train, look and fight like Marines (a force that is trained, configured and optimised to conduct operations over the land but launched from the sea). We are and seek to remain the best small army in the world. If we are to remain the best small army in the world then we need to be able to demonstrate an ability to adapt, prepare, sustain and excel as a component of a future ADF and regionally dominant amphibious capability".

The Chief of Air Force, Air Marshall Mark Binskin AM, then spoke on the role of air power in combined and joint operations from the sea. He remarked that it was 65 years ago that the last Australian sailor (or soldier for that matter) was killed as a result of air attack. Today it is easy to take air superiority for granted. This would be a serious mistake. Air power is essential for the safe and efficient conduct of all amphibious operations, even in the most benign threat environments.

He outlined roles for the Air Force including establishing air superiority, providing intelligence surveillance and reconnaissance, and working closely with the Navy in clearing threats to the amphibious force. The air transport fleet would move vital supplies to staging areas whether in Australia or overseas, and later to provide direct flights to sustain the land forces. Offensive Air Support would be a key during the movement and action phases of the operation.

With the future capabilities envisaged in the 2009 White Paper the RAAF will be a fully networked force able to project and sustain combat power like never before. It could operate further afield and with greater persistence than before without drawing upon the resources of allies.

He then outlined future re-equipment with the Wedgetail airborne early warning and control aircraft able to cover 400,000 square kilometres at any given time; the new P-8 Poseidon Multi-Mission Maritime aircraft possessing high transit speed and the ability to refuel in flight; the C-17 and C-130 aircraft of the air transport fleet; and a future Unmanned Aerial System capability with the Heron aircraft, under trial in Afghanistan.

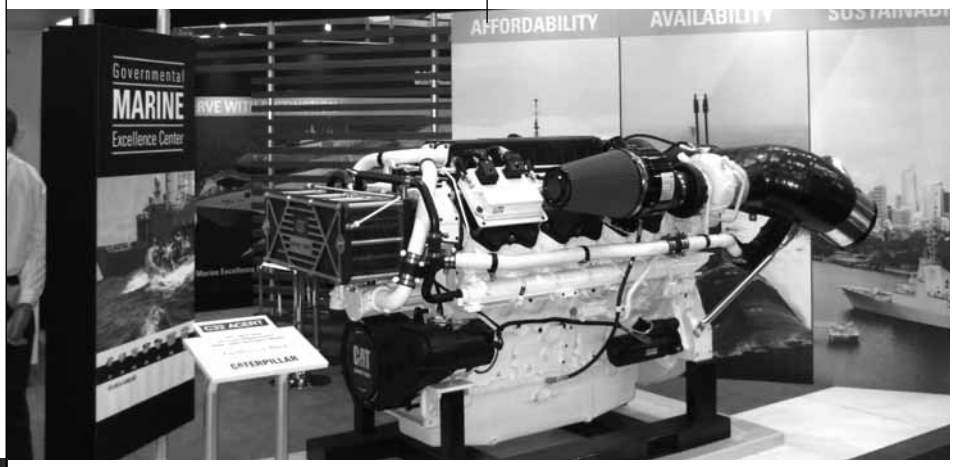
Air Marshall Binskin acknowledged some limitations including the obvious requirement for secure operating bases and limited resources. There would be a need for prioritisation of tasks for airpower and the entire battlespace.

He then covered command control problems which were being examined.

The key concluding message was that, irrespective of the maritime environment that the amphibious task force was operating in, air power expands the intelligence, surveillance and reconnaissance and the strike and defensive capabilities of the task force, and provides a significant sustainment function.

The three Chiefs then answered questions from attendees, perhaps the first time this has been done for many years.

China's perspective was given by RADM Xias Xinnian the Deputy Chief of Staff of the People's Liberation Army-Navy. He concentrated on Chinese efforts in protecting shipping from piracy in the Gulf of Aden. Here China deployed two destroyers/frigates and a replenishment ship, all very well-equipped. International co-operation was essential.



The civilian maritime industries were also present selling all manner of maritime products such as this Caterpillar diesel engine.

A 1:72 scale model the new Hobart class destroyer. Of note is the SPQ-9B radar on the main mast for high fidelity close range air/surface search which will be fitted to the new AWDs.

Japan's perspective was delivered by RADM Izuro Fukumoto, the Vice-President of the Maritime Self Defence Force Staff College. He spoke of Japan's utter reliance on the security of Maritime Commerce, noting that 99.7% of her trade went by sea, and 90% of her crude oil needs came from the Middle East. Japan maintained two ships in the Gulf of Aden for anti-piracy work. International co-operation was essential to combat piracy effectively. When asked about pirate apprehensions by the JMSDF RADM Izuro Fukumoto said under Japanese law only the Coastguard had powers of arrest.

The South Korean perspective was delivered by Captain Sukjoon Yoon, the Director Maritime Studies Naval War College of South Korea. 80% of South Korea's major cities were situated on the sea and the nation was much dependent on sea trade. The Navy was building up with larger but fewer ships. A capability to operate over great distance was needed. New landing ships were projected. The Marine Corps was

the second largest in the world, with two divisions and a brigade. South Korea was working towards a Brigade group deployment capability. There was a need for organised air for amphibious operations.

The Indonesian perspective was given by Colonel Desi Albert Mamahit, the Senior Staff Officer for Strategic Operations of the Indonesian Navy. He outlined the important 2006 Lombok agreement for Security Co-operation with Australia, and the problems of smuggling, illegal immigration, piracy, and natural disasters in the area. Help was welcome. The principles for maritime co-operation included the peaceful settlement of disputes; the renunciation of the use or threat of force in resolving disputes; respect for sovereignty; and non-interference in internal affairs.

Indonesia was eager to enhance maritime co-operation which at present comprised navy to navy talks; naval exercises; education and capacity building measures; personnel exchanges; and port visits. Future co-operation included humanitarian assistance, search and rescue; the co-ordination of patrols including those for illegal immigration and fishing; information sharing; and logistics and technology.

The Royal Marine perspective was delivered by Major General Andy Salmon CMG, OBE, RM, the Commandant General of the Royal Marines and the commander of the United Kingdom Amphibious Forces. He spoke from a background of much personal experience of modern warfare of various types in Northern Ireland, The Falkland Campaign, Iraq, Angola, and Sierra Leone. He congratulated the three Australian Chiefs of Navy, Army and Air Force in speaking with one voice on their support for an amphibious capability.

Britain could deploy an Amphibious Ready Group with a landing force of 5000 personnel, 63% of which were Royal Marines, being transported, launched and supported by 10 specialised ships.

Often, soon after landing, the military would not be in charge. A whole-of-Government approach was essential and Departments other than Defence had to be ready to take on their responsibilities. This aspect needed much further development.

In some operations air support would be critical. Helicopters and UAVs were useful but support from the Air Force, from Carriers, and STOVL aircraft was needed.

A New Zealand Defence Force perspective on humanitarian response was given by RADM Tony Parr MVO, RNZN, Chief of Navy. The Pacific Island community in New Zealand was no less than 10 to 12% of the population. The Pacific Islands were particularly vulnerable to natural disasters and New Zealand had established an Emergency Task Force as a response group. This was self-sufficient for 7 to 14 days and had a very small call on local resources. The new HMNZS CANTERBURY with her helicopters and large carrying capacity was central to this response group.

The Netherlands representative, Lt Col Marc Houben RNLMC, the Director of Doctrine, Netherlands Maritime Warfare Centre, spoke on Amphibious Operations "New Style". The Netherlands Marines have existed since 1665. At present the Corps has 3,300 personnel and can field a staff for up to a brigade size amphibious operation. The Dutch have two LPDs (Landing Ships) with a Joint Support Ship due to join the force in the next few years. The Netherlands and the United Kingdom formed the UK/NL Amphibious Force in 1972 – a classic example of successful amphibious integration. Colonel Houben outlined the history of amphibious warfare; the new impulse for combined and joint operations from the sea and the role of the Netherlands Navy/Marine Corps team as a versatile instrument for the Dutch Government and as a contributor to multinational formations.

Dr Martin Murphy – Senior Fellow, Center for Strategic and Budgetary Assessments – Washington, presented a paper focusing on the risk presented to expeditionary operations, and their supply lines by irregular warfare groups. These threats will emanate from non-state actors, including criminals, and from states working through proxies they have armed, in some cases, with advanced weaponry. Australia sits on the periphery of a vast maritime theatre the geography and hydrography of which is ideal for irregular combat; over the last four or five decades, the region's waters have witnessed the effective use of irregular techniques by criminals (pirates), by politically-motivated groups, and by armed forces working with pirates. None of these have, however, approached the sophistication of the Sri Lankan LTTE or the various Palestinian groups, which assembled organisations that could be described as 'non-state navies.'

The Israeli mini-typhoon mount with .50-cal heavy machine gun. These are already fitted to all RAN ships on operations in and around the Persian Gulf.

Nor have they benefited from state support at a level extended to Hezbollah by Iran, including the transfer of high technology weaponry and training. This might be a model for others and thus non-state actors might be able to present navies with a credible threat when operating in narrow waters.

Vice-Admiral Sir Jeremy Blackham KCB RN (Rtd) the editor of '*The Naval Review*' spoke on the Littoral Area of Operations. He asserted that the littoral area of operations forms the archetypal joint arena. He asserted that this area is one over which no one Service or environment can predominate but rather that all five environments (sea, land, air, space and cyberspace) are wholly interdependent. What is new today is the ability to use the information, weapons and techniques of one service or one environment in the direct interests of all the others. The Littoral area of operations represents a new paradigm for joint operations and one which will have profound implications for the most effective and cost effective design of force structures, and for the way in which command is exercised. Inevitably such changes will cascade downwards into manpower and training arrangements, as well as logistic sea basing.

Presentations were also given by ***Commodore Peter Leschen RAN*** on Operations in support of the Aceh, Padang and Samoan natural disasters and by ***RADM Richard Landolt USN***, Commander Amphibious Force US 7th Fleet, on United States Navy Humanitarian Operations.

The United States Marine Corps Strategy and Vision for 2025 was given by ***Lt Gen Terry Robling*** USMA, Commanding General III Marine Expeditionary Force Okinawa and Commander Marine corps bases in Japan.

He stated that his first priority was his personnel. His own Marine Expeditionary Force during 2009 was despatched for no less than 80 events, including aid in natural disasters. People were now stressed. There were 20,000 marines in Helmut Province in Afghanistan. The marines were the first troops into that country and were despatched from

the sea. Conventional war was not a thing of the past and the Marines and US Navy had to be ready. For major war the Marines planned to provide two Marine Expeditionary Brigades. However, some 38 amphibious ships would be needed and the US Navy currently had only 30. The key to success in many situations was combined operations from the sea.

General Peter Cosgrove AC, MC (Rtd) who was Chief of the Australian Defence Force from 2002 to 2005 then spoke on the East Timor operation which he commanded, and particularly the role of sea power. After outlining the historical background from the 1975 occupation by Indonesia to the INTERFET move in early September 1999 he covered the evacuation by air, with unarmed ADF personnel, of UN staff a few days later. This took place in daylight and was unopposed. He highlighted that it would have been relatively easy to deny the use of airfields and had the evacuation been opposed the navy's role would have been vital.

On 20 September Australia led the return of INTERFET and many thousands of ADF personnel were involved. The Australian media imagined that this was all done by air, but the RAN and other naval forces

French company SAGEM displaying radars and image intensification equipment for naval use.

were already on the way for the 173 days of the operation. The very presence of naval forces was to the locals a sign of interest, influence and intent and a powerful reminder of friends across the water. The first indication of deliverance for the local people was to gaze out to sea and see Australian warships approaching. There was always a warship off the tiny enclave in West Timor and this gave great comfort to the local people.

He stated that without sea control the operation was not possible. A land force needs the navy to keep it secure from attack, to support the army, for air defence, and for gunfire support.

In the East Timor operation one Brigade built up to nearly a Division and much naval support was needed. Logistics, despite the great RAAF transport support, undoubtedly came mostly by sea, and he fully supported the building of the two new large LHDs.

Every general must embrace the realities of sea power in order to fight and survive ashore.

During question time both Generals Robling and Cosgrove were asked for their views on STOVL (Short take-off/vertical landing) aircraft and why the US Marine Corps had embraced this type of aircraft. General Robling stated that the main reason was the flexibility provided. He insisted that during the invasion of Iraq a road near Baghdad was used to refuel these aircraft. General Cosgrove considered that the technology was interesting but Australia's defence force was only one third the strength of the US Marines so there were problems of funding and priorities.

Presentations were also given on the place of the future amphibious warfare capability in expeditionary strategy noting the huge number of islands to Australia's north, on the Air Warfare Destroyer; the LHD and training implications; the role of industry; key factors in achieving future amphibious capability; and the execution of expeditionary operations.

A representative of the Commander of the 16 Aviation Brigade of the Australian Army spoke on army's combat aviation afloat and the problems involved. This Brigade has 44 aircraft and 1164 personnel divided into three Aviation Regiments. One problem was that the new TIGER Helicopter was not designed for operations at sea and its rotor blades would not fold, causing stowage and handling difficulties. It was also difficult to form a mixed group of helicopters for operations from the sea.

In closing the conference Admiral Crane observed that combined and joint operations from the sea represented a re-thinking of ADF operations. It provided the government with versatility across all operations from benign to war. A rethink of doctrine was needed.

Comments

The unity of the Chiefs of Navy, Army and Air Force to the concept of Combined and Joint Operations from the Sea and the development of a modest but highly-trained and well-equipped Amphibious warfare capability is most refreshing and augers well for the development of the ADF. There are major implications for the Army in particular as it re-adjusts to meet the requirements of amphibious warfare. A major re-organisation and development of concepts and doctrine will be involved.

Overall the new direction and equipping of the ADF will give the Government the capability for independent operations to support Australia's interests without having to depend on maritime support from allies.

The huge interest by defence industries as shown in the Exhibition and the development of Marine Complexes in South Australia and West Australia with some belated interest from NSW also augers well for employment and the economy.

The comment by the Chief of Air Force on the need for secure airfields raises some questions. The generally accepted need for air support for amphibious operations; the possibility that suitable supplied and defended airfields may not be near the area of operations; and the huge advantages of flexibility that STOVL aircraft provide for the deployment of air power; seem to indicate that the Navy League's long-standing advocacy for some of the projected F-35 fighters being of the STOVL version needs to be considered.

Also relevant in distant deployments of the ADF is the question of future submarines for the RAN. An official at the French display stand quoted the official cost, including development, of the projected French nuclear-powered attack submarine – the Barracuda – as being 8 billion euros (about $12.6 bn) for 6 boats. Assuming the only quoted calculation of $34 billion for 12 of the projected locally built conventional submarines to be somewhere near the cost, then, with present exchange rates it would seem that modern nuclear boats bought off the shelf should be competitive with the cost of conventional boats built here. Maybe the Navy League's suggestion of some of each, despite training and support problems, warrants consideration, noting the huge operational advantages of nuclear powered boats.

Perhaps the most important concern involving this very important conference was the almost complete lack of media interest. Many would consider it the duty of the media to keep the public informed concerning the development of Australia's Defence Force, noting also the obvious interest of many other nations in the Indo/Pacific.

01 COLLINS FLEET IN TURMOIL

At a recent Senate Estimates Committee hearing, the Defence Material Organisation (DMO) said that is seeking $5 million in damages from state-owned shipbuilder ASC over an engine failure that occurred in one of the Collins-class submarines.

The Estimates hearing heard that the compensation being sought is the maximum available under the terms of a 15-year Collins-class support contract that ASC signed with the government in December 2003.

Responding to questions from opposition defence minister Senator David Johnston, Kim Gillis, the programme manager for Collins-class submarines at DMO, said the government is seeking the damages following the receipt of a report that was conducted into the engine failure in HMAS COLLINS in October 2009.

The committee heard that this report "clearly indicated" that the failure was caused by the way in which bearings were removed, inspected and replaced in HMAS COLLINS.

Gillis said that ASC "is looking at their insurers and also looking at subcontractors that were involved in the [maintenance] activity on HMAS COLLINS", and added: "They have not accepted the claim. We are still in negotiations with them."

Gillis added that negotiations between ASC and the government over a new Collins-class support contract were continuing. A new deal, he said, needed to "move far more towards a performance based contracting methodology" and increase the cap on public liability insurance.

The Senate Estimates committee also learned about the operational availability of the six submarines as COLLINS's engine failure had left only two boats available for sea duties.

Speaking before the committee, Gillis and Chief of Navy, Vice-Admiral Russell Crane, explained that COLLINS had returned to limited operational duty and is planned for a full return in May.

They added that HMAS FARNCOMB, which suffered the electrical loss of one of its three main generators in January, will return at the end of the third quarter in 2010, and that HMAS DECHAINEUX will be available for full duties in May, following scheduled maintenance.

In addition, they said that HMAS RANKIN and HMAS SHEEAN, which are both undertaking full-cycle dockings, would not return to sea duties for another three years and two years respectively. Both submarines have been in dock for the past two years. Currently the only fully operational submarine is HMAS WALLER.

02 FIRST STEEL CUT FOR ADELAIDE

Navantia of Spain has commenced construction of Australia's second Landing Helicopter Dock hull (LHD-02/ADELAIDE) at Navantia's shipbuilding yard in Ferrol, Spain.

The steel for ADELAIDE was cut by Navantia during late January and is almost two months ahead of schedule.

After completion of LHD-01, CANBERRA, and 02, ADELAIDE, both hulls will be transported to Australia.

The island superstructures will then be constructed, fitted out and integrated with the hulls at BAE Systems Australia's Williamstown dockyard.

Once the hull arrives at Williamstown dockyard, the combat system will be installed by SAAB Systems Australia, which will also integrate the combat management system. The communications system will be supplied by L-3 Communications.

The next milestone will be the launch of CANBERRA in Spain during March 2011. It is said she is growing at a rate of 350 tonnes a week. CANBERRA will arrive at Williamstown dockyard in 2012, with ADELAIDE arriving in 2014.

03 FFGs 'ACCEPTED' FOR NOTE

Minister for Defence, Senator John Faulkner, announced the Defence Materiel Organisation (DMO) had received the Chief of Navy's agreement to take the upgraded Guided Missile Frigates (SYDNEY, DARWIN, MELBOURNE and NEWCASTLE) into a formal programme of Naval Operational Test and Evaluation (NOTE). If all NOTE requirements can be successfully completed the ships could then be given full operational release.

"On the basis of the significant progress that has been achieved, Project SEA1390 Phase 2.1, the FFG Upgrade Project, has now been removed from the list of Projects of Concern," Senator Faulkner said.

"This brings the FFG Upgrade contract closer to completion. There is now a defined pathway to the completion of the Project, with the issues surrounding Project of Concern classification sufficiently remediated to remove it from the list.

"There is still work to be done to tune and tailor the delivered systems to Navy's contemporary requirements. There is also an ever-present need to configure and augment the systems in ships deploying into operational areas to ensure that they have the best available capability to meet the threats in those areas" Senator Faulkner said.

The Navy's NOTE and tailoring process will hopefully provide the Chief of Navy with the necessary information to decide whether to accept the ships into full operational service.

The project has had some trouble during its life with the integration of many disparate systems into a newly developed combat system, all for the first time. So there remains a cloud over the FFG's future. The NOTE period will stress the system to ascertain if the upgrade project has delivered a real capability enhancement.

As a separate part of the endeavour to upgrade the FFGs, HMAS MELBOURNE recently fired a

01 HMAS WALLER, seen here arriving at Pearl Harbor for a RIMPAC exercise, is currently the only fully operational submarine in the RAN. (Defence)

02 A section of steel for ADELAIDE being cut by Navantia at its shipbuilding yard in Ferrol, Spain during late January. This is almost two months ahead of schedule. (Navantia)

Standard Missile (SM-2) in the East Australian Exercise Area off Jervis Bay.

The SM-2 missile has been acquired for the FFGs to alleviate deficiencies with the older SM-1 missile in the areas or sustainability, availability and reliability.

Personnel from the USN's Naval Surface Warfare Center, Port Hueneme, were engaged in the development, integration and test of the software upgrade to the weapons control processor of the Mk-92 fire control system. The weapons control processor is a key element in the system that provides the SM-2 engagement capability.

"The primary objective of the firing event was to verify that the FFG could engage targets with an SM-2 in 'Home All the Way' mode," said Craig Tenhoff, NSWC Port Hueneme systems engineer. "We were able to successfully meet the objective on the first attempt."

'Home All the Way Mode' indicates the ability of the SM-2 to track the target from launch to intercept with the ship providing continuous wave illumination of the target throughout the engagement. For the next test event, the SM-2 will only receive illumination of the target moments before the intercept, allowing the missile to fly silently and not alert the target that it is being illuminated/engaged. It also allows the ballistic characteristics of the missile to be exploited giving the FFGs a significant range increase as the missile will be told to intercept the target at a predicted point in time and space rather than chase the target. How this is to be achieved hasn't been fully explained yet as 3D radar data is usually required for the up link to the missile for its autopilot to preposition it for the intercept.

ASC WELCOMES WA FLOATING DOCK

Australian submarine and shipbuilder ASC has welcomed the official opening of the $60 million floating dock at the Australian Marine Complex (AMC) in Henderson, Western Australia on February 9, 2010.

Managing Director and Chief Executive Officer of ASC, Mr Steve Ludlam said the floating dock forms a critical part of ASC's Western Australian submarine maintenance operations.

"The floating dock will ensure that ASC can continue to provide to the frontline of Australia's naval defence force by supporting the maintenance of the Collins Class submarines at the AMC.

"Along with land transfer capability and ASC's maintenance hall, the opening of the dock means ASC is now able to carry out maintenance on as many as three submarines at any one time.

"We're extremely pleased to be a key user of this world-class dock and congratulate the West Australian Government for their commitment to infrastructure upgrades at the AMC," Mr Ludlam said.

The floating dock complements ASC's $35 million submarine support facility at the AMC which provides a dedicated environment for maintenance and repair activities for the Collins Class submarines.

04 FRENCH DESTROYER PROGRAMME SUFFERS 18-MONTH DELAY

The French Navy's Forbin-class (Horizon) destroyer programme has been delayed by 18 months due to the complexity of integrating the ships' combat management system (CMS) and Principal Anti-Air Missile System (PAAMS).

First-of-class FORBIN had been expected to commission in June 2009 with ship two, CHEVALIER PAUL, following in December. The ships were launched by DCNS in Lorient in March 2005 and July 2006 respectively.

Meanwhile, the French Navy is observing the UK firing trials of the Aster anti-air missiles that form part of the PAAMS in the Royal Navy's Daring-class (Type 45) destroyers. FORBIN - which has already successfully fired its PAAMS, according to DCNS - will be commissioned once these efforts are completed.

Confirmation of the lead ship's status comes hard on the heels of CHEVALIER PAUL's delivery by DCNS to the French Navy on 21 December 09 - seven months later than planned. Ship two has now started sea trials under the auspices of the naval training organisation.

Intended to provide theatre and point air defence capabilities, the Franco-Italian PAAMS(E) comprises Selex Sistemi Integrati's G-band EMPAR phased-array radar, Sylver A50 vertical launch system and Aster 15 and Aster 30 surface-to-air missiles. The UK's PAAMS(S) employs the Sampson multifunction radar.

Italy has built two examples of its own Horizon destroyer variant - known as the Andrea Doria class - at Fincantieri's shipyard in Muggiano. It is unknown if the Italian's are suffering the same intergration issues with the CMS/PAAMS as the French and British navies.

05 ASMD UPGRADE COMMENCES ON PERTH

BAE Systems has begun modifying the first of the Royal Australian Navy's ANZAC class frigates to be upgraded under the Anti-Ship Missile Defence (ASMD) Project.

HMAS PERTH entered the Henderson dockyard in Western Australia on 18 January on schedule.

The ASMD project is being managed by BAE Systems, Saab Systems and the Defence Materiel Organisation (DMO) under an alliance contracting arrangement.

The upgrade will significantly improve the anti-ship self-defence capabilities of the ANZAC class by integrating:

03 A Standard Missile 2 (SM-2) Acceptance Test and Evaluation firing in the East Australian Exercise Area on HMAS MELBOURNE, the first firing of its kind from an FFG. (RAN)

04 The French Horizon class destroyer FORBIN.

-The leading edge CEA Phased Array Radars (CEA-FAR & CEA-MOUNT);

-The Vampir NG Infrared Search & Track (IRST) system;

-The Sharpeye Navigation Radar Systems (NRS), and;

-An upgraded Combat Management System (CMS) including an improved Operations Room layout.

Jason Beer, BAE Systems Maritime Through Life Support General Manager, said that the platform integration of these systems would require significant structural modifications.

"This includes replacement of both the frigate's forward and aft masts, which has required us to develop innovative design solutions to minimise the impact on the ship's weight and stability," he said.

Mr Beer said that BAE Systems work during the installation phase would create more than 150 highly skilled jobs at its Henderson base in WA.

06 USN CHRISTENS MISSOURI

With the spray of bubbly from a champagne bottle, PCU MISSOURI (SSN-780), the USN's newest Virginia-class attack submarine, was christened during a late morning ceremony at General Dynamics Electric Boat in Groton, Conn., December 5, 2009.

MISSOURI, the fifth USN ship to be named in honour of the people of the 'Show Me State' is "a link in the honoured chain of ships to bear the name; another chapter in the storied history of the Naval service," said US Secretary of the Navy (SECNAV) Ray Mabus.

The christening marks another milestone for the submarine, which is "now 90 percent complete with construction and is on track to finish US$72 million under budget and well ahead of scheduled," according to director of Naval Nuclear Propulsion Adm. Kirkland H. Donald.

The last MISSOURI, an Iowa class battleship, saw action in World War II, the Korean War, the Persian Gulf War, and was also the site where Fleet Adm. Chester Nimitz, Gen. Douglas MacArthur and many other US and Allied officers accepted the unconditional surrender of the Japanese at the end of World War II on September 2, 1945.

MISSOURI is expected to be delivered to the USN this year and begin her missions.

The 7,800-ton MISSOURI was built under a teaming arrangement between General Dynamics Electric Boat and Northrop Grumman Shipbuilding - Newport News. She is 115m long, has a 10.3m beam and will be able to dive to depths of greater than 259m and operate at speeds in excess of 30 knots submerged. MISSOURI is designed with a nuclear reactor plant that will not require refueling during the planned life of the ship – dramatically reducing lifecycle costs while increasing underway time.

RUSSIA SELLING SUBMARINES, WARPLANES TO VIETNAM

Vietnam has signed a deal with Russia to buy submarines, aircraft and other military hardware, said Vietnamese Prime Minister Nguyen Tan Dung during December 2009.

No details on the contract terms, sum involved, or types of military systems have been made available, but according to earlier media reports, Russia plans to sell Vietnam six Kilo-class Project 636 diesel-electric submarines, worth US$1.8 billion.

Vietnam has also reportedly ordered Svetlyak-class patrol boats and frigates.

UK FUTURE SURFACE COMBATANT ENTERS DESIGN PHASE

BAE Systems in the UK have signed a US$5.6M contract with the UK Ministry of Defence (MoD) to begin the design studies for two of the three surface platforms that will encompass the Future Surface Combatant (FSC) programme. This contract covers the designs for the FSC-C1 destroyer and the FSC-C2 frigate. The FSC-C3 portion of the program will be an Offshore Patrol Vessel (OPV) that will replace today's patrol and mine countermeasures vessels (MCMVs) and will not begin until after the start of C1 and C2.

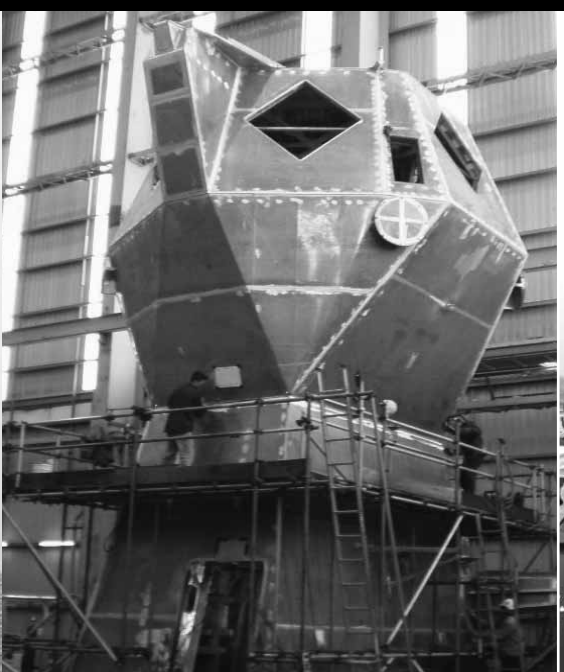
The design studies, being conducted by BVT Surface Fleet, will probably culminate around 2011 at which time Main Gate Approval is expected for both combatant segments of the program. BAE Systems is currently engaged in the FSC Programme as it has already signed a 15-year Business Agreement with the MoD to be the lead contractor and systems integrator until programme completion. BAE is now working with other key industry partners (Thales UK, Babcock Marine, Qinetiq and BMT Defence Systems) to develop the business case and cost model for the whole life of the programme.

The first combatant (C1 variant) will probably begin construction in 2013 in order to have it in service by 2019. The 2013 start will provide an even work flow for BVT as the sixth and final Type 45 (Daring class) destroyer will be commissioning at that time. Projections currently call for 10 units of the FSC-C1 destroyers and 8 units of the FSC-C2 frigates. These vessels will replace the current force of Type 22 and Type 23 class frigates and will remain in service through 2050.

This is the first major surface combatant construction programme in which the UK maritime industry is so intricately involved in the planning with the MoD from the beginning, enabling the joint project team to develop a better view of the costs, schedules and design from the outset. This acquisition strategy is aimed at providing a win-win situation for industry and the Royal Navy (RN) at a time in which competition for defence budget funds is growing.

05 The aft mast section housing the CEA-FAR and CEA-MOUNT radars being built at BAE Systems facility at Henderson dockyard in Western Australia. (BAE)

06 PCU MISSOURI (SSN-780), the USN's newest Virginia-class attack submarine being christened at General Dynamics Electric Boat in Groton, Conn., December 5, 2009.



INDONESIA TO EQUIP WITH CHINESE-MADE ASMs

Indonesia's Navy Chief of Staff, Admiral Agus Suhartono, has announced it is equipping some of its warships with anti-ship missiles (ASMs) made in China.

"We will continue to procure C-802 missiles from China after we tested the weapon with good results," he said, adding that the Indonesian Navy was also negotiating with China to obtain C-705 missiles.

The C-705 is a low cost anti-ship missile (when compared to a C-802) and has a range of 75kms, a 110kg warhead and can be either radar, infra-red or TV guided using a solid rocket motor for medium – high subsonic speed.

"Both types of missile will be added to the armament of the navy's fast patrol boats and Van Speijk warships," Agus said.

"We are still unable to make missiles domestically. But fortunately, state shipbuilding firm PT PAL already has the technology to integrate weapon systems imported from abroad with those already in place on our warships," he said.

07 BAE SYSTEMS RECEIVES USD$185.3M CONTRACT FOR 155MM LRLAP

BAE Systems has received a US$185.3 million contract from the USN for the completion of qualification of the 155mm Long Range Land Attack Projectile (LRLAP). The 155mm LRLAP is being developed for the USN DDG-1000 destroyer programme and will be fired from the two Advanced Gun System (AGS) fitted to the ships.

The 155mm LRLAP is an all-weather, precision-guided munition that has demonstrated successful gun launch and engineering-guided flight to ranges in excess of 63 nautical miles. The 155mm LRLAP qualification programme contract will conclude in December 2012. Work will be performed at the BAE Systems facilities in Minneapolis and Louisville and at Lockheed Martin's facility in Orlando.

FIRST TWO UPGRADED P-3C DELIVERED TO PAKISTAN

Lockheed Martin recently delivered two of seven upgraded P-3C maritime surveillance aircraft for the Islamic Republic of Pakistan under the US Government's Foreign Military Sales programme.

The most recent aircraft delivery occurred on January 7 to the Naval Air Station in Jacksonville, Fla., for subsequent transfer to Pakistan. Lockheed Martin delivered the first plane in October 2009.

Lockheed Martin is upgrading the P-3Cs' aircraft and mission systems and providing maintenance under a 2006 contract from the USN's Naval Air Systems Command. The aircraft are designed to have a single integrated tactical picture of the battle space, drawing upon data from aircraft sensors and information from other platforms.

SM-6 CLEARED FOR SEA TRIALS

The USN is preparing to take Raytheon's new extended-range Standard Missile 6 (SM-6) to sea for its next phase of testing with a series of telemetered and live firings planned for 2010.

A fourth and final land-based guided test launch took place on 11 January and knocked down its target, successfully meeting its engineering test objectives, according to a Raytheon statement, which essentially cleared it for a phase of at-sea testing with up to 20 test-flights.

08 USS INDEPENDENCE COMMISSIONED

Nearly 500 guests braved the rain on January 18 in Mobile, Alabama, to attend the commissioning of USS INDEPENDENCE (LCS-2).

INDEPENDENCE joins USS FREEDOM (LCS-1) in the revolutionary Littoral Combat Ship (LCS) class, already making its mark on the fleet.

"LCS will have the capability...to secure the littoral regions upon which communities rely on for food, transportation and for their well-being," said Adm. Gary Roughead, Chief of US Naval Operations, "and to protect critical chokepoints in the global supply chain, to launch unmanned air, underwater and surface vehicles that will keep our trade at sea and our men and women ashore safe from harm."

LCS is a fast, agile, mission-focused ship that demonstrates the latest in naval warfighting technology. The ship is specifically designed to defeat "anti-access" threats in shallow, coastal water regions, including fast surface craft, quiet diesel submarines, and mines. To meet the combatant commander's increased demand for mission-tailored forces packages, LCS features an interchangeable modular design that allows the ship to be reconfigured to meet mission requirements.

INDEPENDENCE is a 419-foot aluminium trimaran, the first of its design in the surface fleet. It has a displacement of 2,800 metric tons, is capable of speeds in excess of 45 knots, and can operate in water less than 20 feet deep. Propelled by four water jets via to two diesel and two gas turbine engines, the ship boasts a range of over 3,500 nautical miles.

09 PEARL HARBOR BIDS FAREWELL TO USS LOS ANGELES

USS LOS ANGELES (SSN-688) departed Naval Station Pearl Harbor on January 14, for her final voyage to Puget Sound Naval Shipyard for inactivation.

LOS ANGELES has patrolled the world's oceans for 33 years, conducting all but one of her 18

07 A computer generated image of BAE's new 155mm Advanced Gun System (AGS) on one of the USN's projected DDG-1000 destroyers. (BAE)

08 The trimaran USS INDEPENDENCE being commissioned in the rain at Mobile, Alabama. (USN)

deployments in the Pacific. She is the fourth naval ship to be named after the city of Los Angeles, and is the lead ship of her class.

Launched on April 6, 1974, at Newport News Shipbuilding and Dry-dock Company in Newport News, Va., LOS ANGELES was commissioned on November 13, 1976. She hosted President Jimmy Carter and the First Lady on May 27, 1977, for an at-sea demonstration of the capabilities of the USN's newest fast-attack submarine. She then made her first operational deployment to the Mediterranean Sea in 1977 and was awarded a Meritorious Unit Citation.

In 1978, LOS ANGELES transferred to the Pacific Fleet and was assigned to Submarine Squadron 7, homeported in Pearl Harbor. The sub and her crew operated with distinction over the next 32 years, conducting 17 Pacific deployments. Along the way, LOS ANGELES earned eight Meritorious Unit Citations, a Navy Unit Citation, and the coveted Marjorie Sterrett Battleship Award, awarded to the Pacific Fleet's top warship.

Additionally, she was awarded her squadron's annual Battle Efficiency "E" for excellence in combat readiness eight times. LOS ANGELES participated in four multinational "Rim of the Pacific" or RIMPAC exercises, and visited numerous foreign ports in Italy, Republic of the Philippines, Diego Garcia, Hong Kong, Mauritius, Australia, Japan, Republic of Korea, Canada and Singapore.

RNZN TAKES DELIVERY OF OFFSHORE PATROL VESSEL

Chief of the RNZN, Rear-Admiral Tony Parr and NZ Ministry of Defence Project Director Gary Collier formally accepted the Offshore Patrol Vessel, HMNZS OTAGO, into the Royal New Zealand Navy at a ceremony in Melbourne on 18 February.

"OTAGO and her sister ship WELLINGTON will deliver the Navy substantial new capability to undertake Exclusive Economic Zone patrols, surveillance and military operations around New Zealand, the southern ocean and the Pacific," said Admiral Parr.

"OTAGO and WELLINGTON have the capability to operate further offshore than our existing patrol vessels, stay at sea longer, and conduct more challenging operations – using their helicopter capability, sea-boats and embarked forces."

Rear-Admiral Parr said it was no secret the RNZN had waited longer than planned to get the ships.

"The Navy is now focused on getting these ships into service to do the jobs they were designed for. We're confident the issues around the ships' weight, which have contributed to delays in acceptance, can be managed so they can successfully carry out their missions. We wouldn't have accepted the ships otherwise."

HMNZS OTAGO is the sixth ship in the Project Protector fleet. Acceptance of OPV WELLINGTON into naval service is expected in April.

Admiral Parr said that with the delivery of OTAGO and WELLINGTON the Navy will be operating a fleet of 12 modern, hi-tech and highly capable ships.

"With the completion of Project Protector the Navy can deliver the full range of maritime military capability from combat and security missions to peacekeeping, border patrol and humanitarian and disaster relief," said Admiral Parr.

The delivery crew of HMNZS OTAGO will now undertake safety and operational preparations for her voyage to New Zealand. We expect OTAGO to arrive at Devonport Naval Base toward the end of March where she will be welcomed with appropriate ceremony."

10 RN TYPE 42 UPDATE

HMS NOTTINGHAM, one of the RN's two remaining Type 42 Batch 2 destroyers, was decommissioned on 11 February at Portsmouth naval base.

NOTTINGHAM completed its final deployment in April 2008 and had been maintained at reduced readiness for the past 22 months after clocking up almost 700,000 nautical miles (1.3 million kilometres) on operations across the world over the last 30 years,

Among the guests at HMS NOTTINGHAM's decommissioning service at Portsmouth Naval Base was former First Sea Lord, Sir Henry Leach, whose wife, Lady Leach, launched the ship in February 1980.

Their daughter, Henrietta Wood, who is the ship's sponsor, was also present along with many of the ship's 15 former Commanding Officers.

HMS NOTTINGHAM - the sixth ship to bear the name - was built at Vosper Thornycroft in Southampton and launched on 18 February 1980. Early deployments saw the ship sail to the South Atlantic, the Far East and the Gulf.

On 23 July 1984 the ship was granted the Freedom of the City of Nottingham and since then has maintained close links with its charities, hospitals and schools.

In November 1996 HMS NOTTINGHAM became the first UK warship to visit the Black Sea port of Poti in 75 years.

During a deployment to the Far East in 2002 HMS NOTTINGHAM gained notoriety after hitting a rock off Lord Howe Island (see *THE NAVY* Vols 71. No 4 & 72. No 1). The ship returned to sea in 2004 following an 18-month repair programme.

In June 2006 NOTTINGHAM returned from six months of counter-terrorism and maritime security patrols in the Mediterranean, working alongside five other NATO nations. The ship trained and operated with two ships from the Russian Federation - the first time ships from that nation had been involved with training for multi-force anti-terrorism operations.

09 USS LOS ANGELES during her decommissioning ceremony at Pearl Harbor. (USN)

HMS NOTTINGHAM returned from her final deployment, patrolling the South Atlantic, in April 2008.

The final Type 42 Batch 2 destroyer, HMS LIVERPOOL - which was due to retire in 2009 - will remain operational until 2012.

With four Batch 3 ships also still in service, the UK's destroyer force currently stands at just five units, although the figure will rise to six when the first of the new Daring-class (Type 45) destroyers is declared operational.

One of the four remaining Batch 3 destroyers, HMS EDINBURGH, entered the dry dock in Portsmouth on January 18 for a major overhaul under a £17.5 million contract with BAE Systems. As the last of the Type 42 destroyers to undergo an upkeep period, the move marks the end of a successful maintenance schedule for the class that began in 1979.

During the extensive refit, her hull will be coated with a super-efficient Sigma 990 paint to make it glide through the water more easily and an underwater spoiler known as a transom flap will be fitted to the stern, which together will cut fuel consumption by up to 15%. Weapons and communications systems will also be revamped and preparations are underway to remove all four of the ship's engines, with two to be restored and the other two to be replaced.

The 30 year old vessel will be returned to the fleet in October 2010 as a greener, more efficient ship and will sail on until 2013.

11 US FLEET STRENGTH TO FALL BELOW 300 SHIPS

During February the US Department of Defense (DoD) released three key documents that will have significant impact on the direction and force levels of the USN for the next 30 years. Those documents include the US Quadrennial Defense Review (QDR) 2010, FY2011 30-Year Shipbuilding Plan (SBP) and the President's FY2011 Budget Submission.

The US President's defence budget submission for FY 2011 totals US$549B in discretionary funding for peacetime operations, US$4B in mandatory funding, US$159B for overseas contingency operations (OCO) and US$26B for national defence activities in the Department of Energy and other agencies. The total FY2011 budget submission is for US$739B or a slight increase (3.4%) in nominal terms over the FY 2010 budget. The budget also includes a US$33B supplemental request in additional funding for OCO for the remainder of 2010.

For the USN, the President's budget requests:

- Procurement: US$46.6B
- Research and Development (R&D): US$17.7B
- Infrastructure:US$5.0B
- Operations & Maintenance (O&M): US$46.2B
- Military Personnel: US$45.1B

The procurement budget includes US$16.1B requested for Shipbuilding and Conversion (SCN), with nine ships authorized in FY2011:

- Two Virginia class submarines
- Two Arleigh Burke class destroyers
- Two Littoral Combat Ships (LCS)
- One Replacement LHA (LHA-R)
- One Mobile Landing Platform (MLP)
- One Joint High Speed Vessel (JHSV)

For 2011, the USN appears on track to begin building two Virginia class per year, restart a sustained (eight hulls initially) new build of Arleigh Burke class destroyers to provide "high end" BMD (Ballistic Missile Defence) and other mission capability in place of the truncated DDG-1000 programme, LHA-R to replace Tarawa class LHAs, and the initial buy of two LCS under the new LCS acquisition strategy that will see a downselect to a single hull design in 2010.

Programmed buys of 17 LCS thru FY15—added to the two already in service—as well as increased JHSV (Joint High Speed Vessel) buys will provide relatively affordable new platforms to keep surface force structure numbers up as 26 Oliver Hazard Perry class FFGs leave the USN inventory between 2011-2015.

Looking at FY2011 compared to FY2010, USN shipbuilding numbers increase from seven hulls authorized to nine. The FY2011 request is consistent with the numbers anticipated in the 30 year shipbuilding plan. However, many long-term observers of Navy shipbuilding note that the USN's 30 year shipbuilding plan appears barely executable given the range of future pressures likely for the Navy's overall budget, and competition for funds between procurement and growing Navy personnel and Operations and Maintenance funding requirements.

The QDR also suggests Navy ship strength will trend more towards 280-300 hulls between now and 2040, lower than the 313 ship "floor" than the 30 year plan now describes as a "departure point" for fleet force planning. Significant changes in the FYDP and the QDR include deletion of the next generation surface combatant (CG-X) in favour of additional DDG-51s and cancellation of the command ship replacement (LCC) in favour of a Service Life Extension Programme for existing Command Ships (both of which are more than 40 years old).

Fifty ships are slated to be built in the 2011-2015 FYDP within a total SCN budget of US$72.4B. Assuming that the budget and planned numbers of hulls remain intact over the next five years, the question arises as to what happens to the force levels beginning in 2016. As noted above, there are significant differences in the mid-term USN force structure outlook between QDR 2010 and the Navy's 30 year plan:

10 HMS NOTTINGHAM being towed from her inactive berth to the decommissioning ceremony. Note the new Type 45 Daring class destroyer in the background. Despite NOTTINGHAM being closer to the camera the Type 45 is much bigger. (RN)

Ship Type	QDR Levels	30-Year Shipbuilding Plan Levels 2040
Aircraft Carriers	10-11	11
Large Surface Combatants	84-88	76
Small Surface Combatants	14-28 + 14 MCMV	55
Attack Submarines	53-55	45
Guided Missile Submarine	4	0
Ballistic Missile Submarine	4	12
Amphibious Ships	29-31	30
Combat Logistic Force	30-33 + 1 MLP	28
Support Ships	17-25	44

One major area of difference between the two is in the number of small surface combatants, with only 14-28 small surface combatants plus 14 mine countermeasures vessels envisioned in the QDR, compared to a total of 55 total in the SBP—with the current force mix of Mine Warfare ships, FFG, PC, and LCS transitioning to an all LCS small combatant force by the late 2020's.

When looking at the long-term differences between the QDR and the SBP, total Navy hull strength in QDR varies between 270 – 304. The 30 year plan sees the Navy growing from 292 ships in 2011 to 301 in 2040. Support ships actually increase by 27 units through 2040 while surface combatants, submarines and amphibious ships actually decrease by 29 ships. This drop of 29 does not include the small surface combatants due to the anomaly between QDR and the shipbuilding plan.

The major question is, how does the USN address the differences between QDR and the SBP and does the sea service really expect to maintain a steady number of combatants, submarines and amphibious ships.

11 More Arleigh Burke class destroyers are on order for the USN at the expense of the DDG-1000 Zumwalt class destroyer programme. Seen here (front to back) are US Ships PAUL HAMILTON, HOPPER and RUSSELL. (USN)

Defence and the Armed Forces have not lacked media attention in recent months, with subjects ranging from policy and material issues to the actions and activities of personnel. The following comments relate only to attention given to some matters involving the Navy, and even then very briefly as there are ongoing legal proceedings at the time of writing.

THE SINKING OF SIEV 36

The sinking of the boat designated SIEV 36 carrying 47 asylum seekers and two crew members off Ashmore Reef in April last year and subsequent loss of five lives is an unhappy part of the unfinished story of Australia's reaction to those who seek to enter the country from the sea without prior permission.

The actions of naval personnel before and after the explosion that caused the boat to founder have been the subject of media speculation and discussion; it is inappropriate to comment on this aspect of the sinking as the matter is the subject of unfinished legal proceedings but a general observation would seem to be in order.

- Searching for matches etc: It cannot be an easy task for numerically small boarding parties – half-a-dozen or so – to search and remove cigarette lighters and matches from perhaps 100 or more asylum seekers and crew on board a possibly unseaworthy boat even in ideal sea conditions; just one item missed would be enough to cause disaster.
- Saving lives at sea: There is a convention that in the event a ship is sinking or about to sink, women and children will be saved first, a custom that will no doubt continue to be honoured. In circumstances involving nationals and foreigners together with limited resources there must be no attempt to determine priority in advance by regulation. Hopefully not too many such situations will arise.

From time to time in recent years the ability of political leaders and commanders of forces engaged in operations to communicate with each other almost instantly has been considered as not always helpful, not least when political leadership offers advice or issues instructions; it is suggested that the initiative of commanders is sapped. Fortunately the commanding officers of Australian warships still make decisions depending on the circumstances at the time and place of the operation or event; hopefully this will continue.

JUSTICE DELIVERED

Also in April last year three crew members of HMAS SUCCESS were discharged from their ship which was visiting Singapore at the time and sent to shore establishments in Australia; it was alleged that, in bookmakers parlance, they were keeping a 'book' on the sexual activities or otherwise of colleagues.

After an inquiry in Sydney it emerged that bias was an issue, resulting in the Minister for Defence announcing in February that another inquiry, presided over by a retired judge, would investigate the matter. The Chief of Navy has expressed support for the new inquiry.

The naval disciplinary process, as part of the military justice system has been the subject of change over the years; it has to be hoped that lengthy delays between allegations of an offence and a decision as to innocence or guilt can be avoided.

FEUDING AT SEA

The return of the *Steve Irwin* and *Bob Baker* to port appears to mark the end of the present session of feuding between the *Sea Sheppard* anti-whaling group and the Japanese whaling Fleet.

As this observer has remarked before, engaging in risky manoeuvres on the high seas is a dangerous pastime and it is rather surprising that no action or authority seems able to stop it. If and when someone losses their life something will be done about the situation.

BUILD OR BUY OFF THE SHELF?

In an interview with *THE AGE* in December last year the then recently appointed Secretary of the Defence Department, Dr Ian Watt, commented on the acquisition of Defence material "off the shelf" rather than designing and building equipment in Australia. This is a subject that has vexed the RAN over the years when new ships are needed and will probably continue to do so.

As a general rule governments have preferred to build ships for the Navy in Australian shipyards – employment, self-sufficiency in an emergency - and there can be no doubt the yards have built some fine ships including frigates and destroyers and fleet tenders up to about 20,000 tonnes. The complexity and cost of equipment to be fitted to a warship has always been a major factor when deciding on a local build or to look at some other option; other factors include urgency of the requirement, availability of a substitute, delivery time, numbers proposed availability of local resources and so on. Australia is not alone with this problem and it is doubtful if any country is completely self-sufficient at the present time.

In the past there has been a tendency to put too much and the very latest equipment into locally planned ships, resulting in delays, cost increases and an increase in the size of the ship. The writer recalls the 'light destroyer'/DDL project of the sixties that grew to such an extent as each department put in its wish list that 'light' became a misnomer and the project was abandoned. The American Oliver Hazard Perry class FFG, although not the first choice of the Navy, was chosen to replace the DDL design. The six FFGs, four built in the US and two in Melbourne, have given good service with four still in commission.

With recent confirmation of the need for maritime security, a planned very substantial increase in the number of submarines – and the experience of the locally built Collins class boats as a guide – together with new surface ships, it is clear that very careful consideration will be essential before a decision is made to design and equip and who is then to be the builder.

This image was taken 15 minutes after the incident on Suspected Illegal Entry Vessel (SIEV) 36, HMAS ALBANY's RHIB is recovered by CHILDERS to disembark casualties that are unable to walk/climb. The image also shows the burning SIEV, HMAS ALBANY and three RHIBs continuing recovery effort. (defence)

2ND PLACE

A LUCKY ESCAPE FOR HMS AMETHYST, AND HMAS SHOALHAVEN, ON THE YANGTZE – 1949

LCDR Desmond Woods, RAN

LCDR Desmond Woods, in this his 2nd place 2009 Navy League of Australia Professional Essay Competition entry, details the tragic story of HMS AMETHYST and her battle for survival up a river in China against communist forces, and how close an Australian warship was to being in AMETHYSTs place.

In Australia it is a little remembered fact that 61 years ago, in April of 1949, the Admiralty came close to sending the RAN frigate HMAS SHOALHAVEN, then serving with the RN Far East Fleet, into an unwinnable fight with Chinese communist gunners. It was a only a prudent appraisal, and timely decision, made first in Canberra by the Menzies Government and then by the Flag Officer Far East Fleet that prevented the ship's company of SHOALHAVEN from being put in mortal danger on the Yangtze River and being needlessly killed and wounded.

In April, 1949 as Nationalist forces were being defeated across China, Chiang Kai Chek's beleaguered government hung on to a shrinking perimeter in Nanking, two hundred miles up the Yangtze from Shanghai and the sea. The Royal Navy's 3rd Frigate Flotilla and 8th Destroyer Flotilla had for some months provided a guardship at Nanking.

Quite what the guardship's function would be in the event of a Communist attack on Nanking was not made clear. Her purpose was to 'show the flag' and could only be symbolic. In theory she could provide a place of safety for diplomats and evacuate them down river. In practice this was never a likely or practical scenario. Britain was a neutral power in the civil war wracking China and this led the Admiralty to believe that RN or RAN ships, well marked with white ensigns and national flags, would continue to be allowed to pass on the Yangtze 'on their lawful occasions' as they had done for a century. Their Lordships were sadly mistaken. Neutrality was a meaningless concept to Mao.

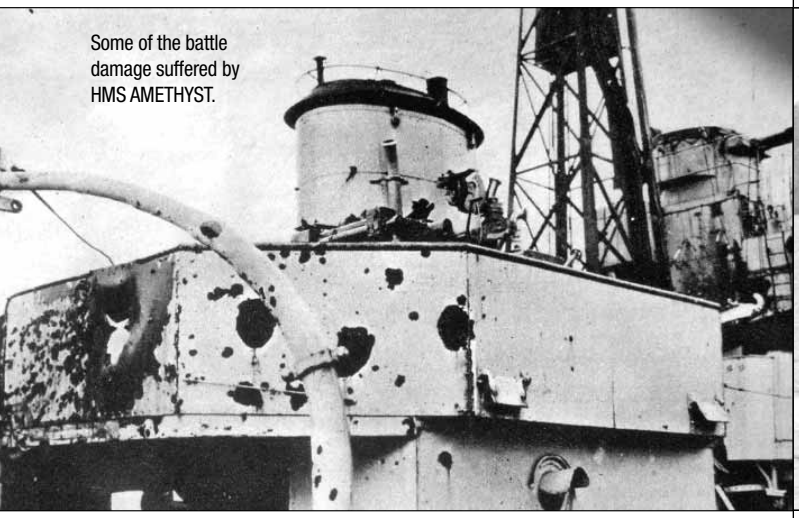
The destroyer HMS CONSORT, the current Nanking guardship, was due to sail from Nanking on 19th of April. Her relief ship was to sail simultaneously upstream from Shanghai to Nanking. What no one in the Far East Fleet knew was that the Communists would occupy Nanking on 24th of April. CONSORT being scheduled to sail on the 19th April would mean she would be just in time to escape

HMS AMETHYST. AMETHYST was a Modified Black Swan-class sloop. She was laid down by Alexander Stephens and Sons of Linthouse, Govan Scotland on 25 March 1942, launched on 7 May 1943 and commissioned on 2 November 1943, with the pennant number U16. After World II she was modified and redesignated as a frigate, and renumbered F116.

being trapped at Nanking. Her relief ship would never get there. HMAS SHOALHAVEN would have been that unlucky relief ship had the Australian government not decided that she should only be used if there was a clear humanitarian role for her in rescuing foreign nationals from peril. It was decided in Canberra that she was available for mercy missions only, but not for guardship duties.

When Menzies made known to the UK government his decision not to permit SHOALHAVEN to be used as a Nanking guardship, the Admiralty might have reconsidered its whole position on the Yangtze. Their Lordships might have decided that if the Australian government was unprepared to hazard sailors' lives, for no achievable aim, then a prudent policy might be to bring CONSORT down the river and not to relieve her. Instead the Flag Officer of the Far East Fleet, Vice Admiral A.C Madden, aware of the Australian reservation on SHOALHAVEN's use, decided that the next available frigate, HMS AMETHYST, was to sail under the command of Lieutenant Commander Bernard Skinner from Shanghai for Nanking

Possible challenge by PLA artillery was anticipated by Madden and both AMETHYST and CONSORT were ordered to sail in a state of readiness to meet the fast changing developments in the civil war. The ships' guns were provided with upper deck ready use ammunition in case of they need to open fire instantly. The ships had large Union Jacks which could be displayed over their sides. As Skinner took his frigate out onto the Yangtze AMETHYST started a tragic four month trial by fire from which the shell shattered ship would eventually return, but which would cost him his life and those of twenty two of his ship's company.



Some of the battle damage suffered by HMS AMETHYST.

HMS AMETHYST patrolling the Yangtze.

Within 24 hours of her sailing from Shanghai the illusion that a declaration of neutrality would protect the AMETHYST was shattered by communist small arms fire from the river bank. Skinner ordered the unfurling of the Union Jacks over his sides. This made no difference to the rapid fire which was soon accompanied by artillery shells. AMETHYST was soon hit hard and often and Skinner was mortally wounded on his wrecked bridge.

The combination of a jammed starboard engine telegraph and an injured coxswain resulted in AMETHYST going aground on Rose Island. Though also seriously injured Lieutenant Geoffrey Weston, the First Lieutenant, took command and ordered the after guns to return fire at the PLA batteries. Chinese shells exploded in the sick bay, the port engine room, and finally hit the generator. Weston with great coolness signalled: "Under heavy fire. Am aground in approx position 31.10' North 119.50' East. Large number of casualties."

The angle at which AMETHYST went aground meant that neither A or B gun mountings could be brought to bear on the PLA batteries, leaving only the twin mounting on the stern to return fire. Thirty four inch shells were fired before the mounting was hit, knocking out one of its two guns. The remaining gun returned a few more shots until ordered by Weston to cease fire in the hope that this would cause the PLA to do likewise. The shore batteries, however, continued to fire both medium and heavy artillery, causing more damage and casualties to the ship. Weston ordered the uninjured to prepare to repel boarders with Bren guns and rifles.

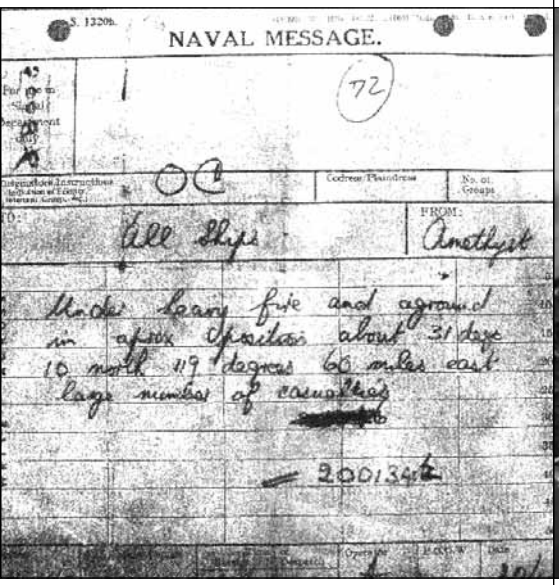
With her bow aground on Rose Island, the ship was a sitting target only two hundred yards from the communist shore batteries which continued to pound the frigate. To save lives Weston ordered the immediate evacuation of most of the crew. Everyone capable of swimming to the bank was ordered over the side, while the non-swimmers and walking wounded used the only one of the ship's boats left undamaged. Fifty-nine ratings and four Chinese mess boys made it to the Nationalist controlled southern bank, but several more were cut down in the water by PLA machine gun and artillery fire before they could reach safety. Those that survived were taken to a nearby Nationalist Army hospital, and returned to Shanghai. AMETHYST now had left onboard only 40 unwounded men, 12 wounded and 15 dead. The shelling had stopped, but no one could move on the upper deck without drawing the attention of PLA snipers. Damage control parties plugged shell holes below the waterline with bedding. AMETHYST has sustained 50 hits from heavy shellfire and had been repeatedly raked with machine gun fire and was full of holes.

While the ship's doctor, Surgeon Lieutenant Alderton and his sick berth attendant worked at speed to treat the growing number of wounded another shell exploded nearby killing them both instantly. For the next six days Lieutenant Peter Berger, the navigator, and Weston dosed themselves on benzedrine so they could remain awake and able to treat the wounded and prepare to defend the ship against a boarding by the communists which they expected but which never came.

On hearing of the attack on AMETHYST CONSORT sailed from Nanking with seven white ensigns flying and large Union Jacks unfurled over her sides. She steamed to the rescue, with all guns' crews stood to, at 29 knots with the river current behind her, a speed never before attempted and which made her hard to steer. As she neared AMETHYST she too came under accurate shore fire to which she replied very effectively with rapid 4.5 inch salvoes which knocked out one shore battery. However when she slowed to prepare to pass a tow to AMETHYST she was then hit several times. Like AMETHYST her bridge and wheelhouse were badly damaged. Her captain was wounded and her coxswain and nine others killed. Both her 4.5 inch guns were put out of action and she was forced to steer from aft, no mean feat for a ship manoeuvring at high speed in restricted water and under fire. But given CONSORT's damage and casualties, further attempts to tow AMETHYST were out of the question and reluctantly she was forced to clear the area and pass down river. CONSORT had taken 56 direct hits and suffered not only nine killed but thirty men wounded. She had no choice but to leave AMETHYST to her fate or suffer the same one herself.

Under cover of darkness Weston and his exhausted men floated AMETHYST off the sand bank, moved her into the middle of the river and anchored, but their situation was still desperate. They were 170 miles upstream from the fleet and between them and Shanghai were the 6 inch guns of the Woosan Forts past which they would have to run the gauntlet if they were to escape. There were critically injured men onboard and their doctor and sick berth attendant were dead. Without effective treatment Skinner had died of his wounds and Weston, now in command, was still seriously injured.

Madden, flying his flag in the heavy cruiser HMS LONDON, decided to try to extricate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NAVAL MESSAGE.

72

OC

Codress/Plaindress | No. of Groups

TO: All Ships

FROM: Amethyst

Under heavy fire and aground in approx Operation about 31 days 10 north 117 degrees 60 miles east large number of casualties

200134

An image of the message sent by AMETHYST to all ships alerting them to her predicament.

AMETHYST. He asked the RAF to try and get a replacement medical officer to the frigate and a Sunderland flying boat duly departed from RAF Kai Tak in Hong Kong for the 800 mile flight to the frigate carrying a doctor. On its second attempt the Sunderland managed to land on the river close enough to AMETHYST to disembark an RAF doctor.

Madden was determined to go to the frigate's rescue himself in his flagship. With the frigate BLACK SWAN and the damaged destroyer CONSORT as his escorts he took his three ships from Shanghai up river. He carried a new commanding officer and a steaming party standing by to relieve AMETHYST's exhausted ship's company. The plan was to escort the battered frigate back to the fleet under the protection of the guns of the big cruiser. But LONDON and her escorts ran into trouble very swiftly. They came under accurate and heavy fire and although Madden blasted at the gun batteries with LONDON's 8 inch main


AMETHYST's cat Simon. Winner of the Dickin Medal.

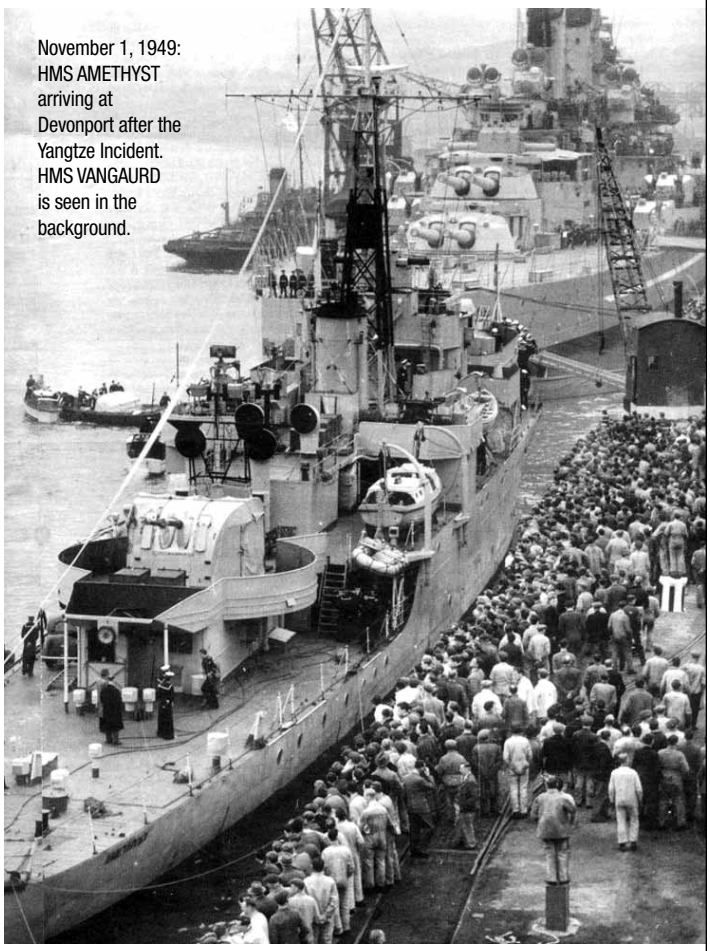
armament and all ships fired their 4 inch guns they were all hit hard and often. With 23 sailors killed and 20 more wounded it became obvious to Madden that he stood to lose far more than he could possibly gain by continuing. Reluctantly he took his ships back to Shanghai for repairs and to bury his dead sailors. HMAS SHOALHAVEN provided the firing party for the burial service. By now the PLA had lost 252 gunners killed and were not in a forgiving frame of mind. AMETHYST was still as far from safety as ever.

At this point a remarkable figure enters the story. Lieutenant Commander John Simon Kerans, the assistant naval attaché in Nanking, was the only RN executive officer close enough to be able to get to AMETHYST and to take command. He was an unlikely hero. Kerans had faced one Board of Inquiry after another. He had even faced a court martial for accepting bribes of wine. He had been posted to Nanking as a punishment for having become 'over refreshed' ashore in Malta on a Saturday night and deciding early on Sunday morning to swim back to his battleship. He arrived in a state of dripping disorder on the quarterdeck during divine service, which the Admiral and his wife were attending, still unsteady and missing many essential garments. Nanking was as far from the Mediterranean fleet as their Lordships could send him; so they did. Now the Royal Navy's pride and the survival of AMETHYST's ship's company depended on this seaman officer and black sheep of the fleet. Comes the moment, comes the man!

Kerans knew that there would be no more costly rescue attempts from Shanghai. It was now up to him to get on board and turn AMETHYST back into a warship capable of moving and fighting again. It is hard to imagine a more daunting leadership challenge. He bribed a sampan owner to take him down river to his command and boarded her under cover of darkness and river mist. Then he started the process of restoring hope to traumatised men who understandably believed themselves to be beyond salvation.

Throughout May, June and July a pointless diplomatic game was conducted between the UK Foreign office and Mao Tse Tung in an effort to get the stricken ship released. While the diplomacy stalled conditions onboard the

HMS CONCORD. "Never, never has a ship been more welcome".



November 1, 1949: HMS AMETHYST arriving at Devonport after the Yangtze Incident. HMS VANGAURD is seen in the background.

cramped frigate deteriorated further in the heat and airless humidity of high summer. The ship's systems were seriously damaged by shellfire and short of the ability to make enough fresh water. The gyro compass, essential for any breakout, was beyond repair. Fuel for generators was getting low and food was rationed. Rats were increasing rapidly and the physical condition of the ship's company was diminishing along with morale. The latter was sustained by the faithful ship's cat, Simon, who despite being injured by shell splinters and burns, not only recovered from his wounds but took on the rat population including the fattest and most fearless rat on board, named, inevitably, Mao Tse Tung, and slew him in single combat. He then put himself down for duty to protect the ship's dwindling food stores from all rodents.

With the Foreign Office having failed to win permission for the ship to move down river it became obvious to Kerans that he and his men had no alternative but to attempt to breakout before they lost the ability to do so. With the encouragement and blessing of the acting C-in-C Far East Fleet, Admiral Brind, Kerans decided to risk all and make a run for it on the moonless night of the 30th July. This was the ship's 101st day of captivity. Timing was all important. The river was as high as it was going to get and as the river charts in the wheelhouse had been destroyed in the attack on the bridge it was essential that the dangerous shoals and sandbanks were well covered with water. Kerans would be sailing in darkness and at speed through treacherous waters he had never navigated before and without a river pilot.

Kerans' yeoman managed to get a rudimentary homemade encrypted signal off to Admiral Brind alerting him to his intention and asking for all possible support on the morning of the 31st July as he came abreast of the guns of the Woosan Forts. The faithful CONCORD duly moved up river to give AMETHYST covering fire if she was attacked.

At sunset on the 30th July Kerans manned his B gun mounting, the only one with ammunition. Almost as soon as she moved the ship came under fire and was hit but this was not serious and AMETHYST worked up her boilers to maximum power and moved out of range. With the river running in flood behind him, steaming at 22 knots with no charts, no compass, no moon and little fuel AMETHYST surged down the river. It was an act of desperate bravery and reckless faith made necessary by an acute lack of alternatives. Kerans the 'black sheep' of the fleet was proving to be the 'man of the match.'

As he neared the halfway point and was approaching the 6 inch guns of the Woosan Forts, Kerans sent a two word flash signal in clear to CONCORD somewhere down river from him. It was a masterpiece of brevity; it simply read, 'Come quick'. Kerans' close friend, Commander Rodney in CONCORD, had anticipated him and was waiting for him in the pre-dawn darkness with a welcoming smoke screen into which Kerans steamed AMETHYST at speed while she too made smoke. As the sun rose illuminating the forts both ships passed them unchallenged. "Fancy meeting you again" signalled Rodney; to which Kerans signalled by light "Never, never has a ship been more welcome". Kerans then made the signal to Admiral Brind which was splashed across newspapers in Britain and America and which made him a household name – "Have rejoined the Fleet south of Woo Sung. No damage or casualties. God save the King".

King George VI on hearing of the escape of one of his smallest ships signalled: "Please convey to the commanding officer and ship's company of HMS AMETHYST my hearty congratulations on their daring exploit to rejoin the Fleet. The courage, skill and determination shown by all on board have my highest commendation. Splice the mainbrace. George R"

Once his story was known Simon, the ship's cat, became an instant celebrity and was awarded the Dickin Medal, which is the British serving animal's equivalent of the VC. Kerans wrote the bravery citation and put Simon up for his medal. Once the award was made known thousands of letters were written to Simon. Sadly he died while under quarantine in Britain due to an infection from his war wounds. His funeral was attended by hundreds including AMETHYST's ship's company

A repaired AMETHYST played herself in the film version of her 1949 escape before she was scrapped in 1956. John Kerans was promoted to Commander and awarded the DSO. However given his chequered early career he was clearly not destined for a glittering career as a senior officer. After being eased out of the Navy he became a British conservative MP and died in 1985 aged 70.

It is impossible now to assess the long term political consequences of an Australian frigate being shelled or sunk on a Chinese river sixty one years ago but one can reasonably assert that if it had been not AMETHYST but SHOALHAVEN that men killed before making her daring escape down the Yangtze the event would still be well remembered in Australia, taught in school history classes and celebrated every year in RAN messes. The extraordinary events that unfolded on the Yangtze, as the PRC was being born in the summer of 1949, can be fairly considered to have resulted in a very lucky escape for AMETHYST and the RN and also indirectly for SHOALHAVEN, the RAN and Australia.

The film poster from 1957 'Yangtse Incident: The Story of HMS Amethyst' (released as Battle Hell in the US, and also as Escape of the Amethyst and Their Greatest Glory) starring Richard Todd as Kerans.
HMS AMETHYST actually re-enacted her role in the film. However, as her engines were no longer operational, shots of the ship moving used her sister ship, MAGPIE.

2ND PLACE

THE SINKING OF FORCE Z:
The Twilight of the Battleship

By Nigel M Beeke

Second place in the Navy League 2009 Essay contest went to Nigel Beeke for his essay on the tragic sea action off Malaya towards the end of 1941 which saw the sinking of two of the RN's capital ships. An action that set the scene for the upcoming Pacific War and the value of aircraft to maritime conflict.

STRATEGIC BACKGROUND

Post-World War I, there was a power vacuum in south-east Asia due to the end of German colonial influence. Japan was able to become the dominant power in the region throughout the 1920s. This coincided with the rise of militaristic nationalism, with democratic party politics weakened by the economic ravages of the Depression. During the decade of the 1930s, governments were a succession of coalitions led by appointed military premiers.

Nationalism was fuelled by anger and resentment generated by the perceived second-class treatment of Japan at the disarmament conferences of the 1920s and 1930s. US laws that imposed immigration, trade and tariff restrictions on the Japanese were also resented.

Japan's military leaders took advantage of the weakness of China to invade Manchuria in 1931 and China in 1937. The US progressively imposed trade embargoes on Japan throughout the 1930s. First aviation fuel, scrap, copper and brass were embargoed, with the USA persuading the British and Dutch to do likewise. Then, in 1940, oil sales to Japan were also frozen. The price asked for the lifting of those embargoes was Japanese withdrawal from China and Manchuria – which was regarded by the Japanese as an impossible blow to national honour.

Japan was not a resource-rich country. Production of oil was not self-sufficient, and Japan faced national bankruptcy due to trade restrictions. The leadership in early 1941 thus accepted war as a necessity to capture British and Dutch possessions in South-East Asia for their resources of oil and rubber. As well as advancing on these possessions, it would be necessary for Japan to neutralize the only powerful Western fleet in the Pacific – the US Pacific Fleet based at Pearl Harbor.

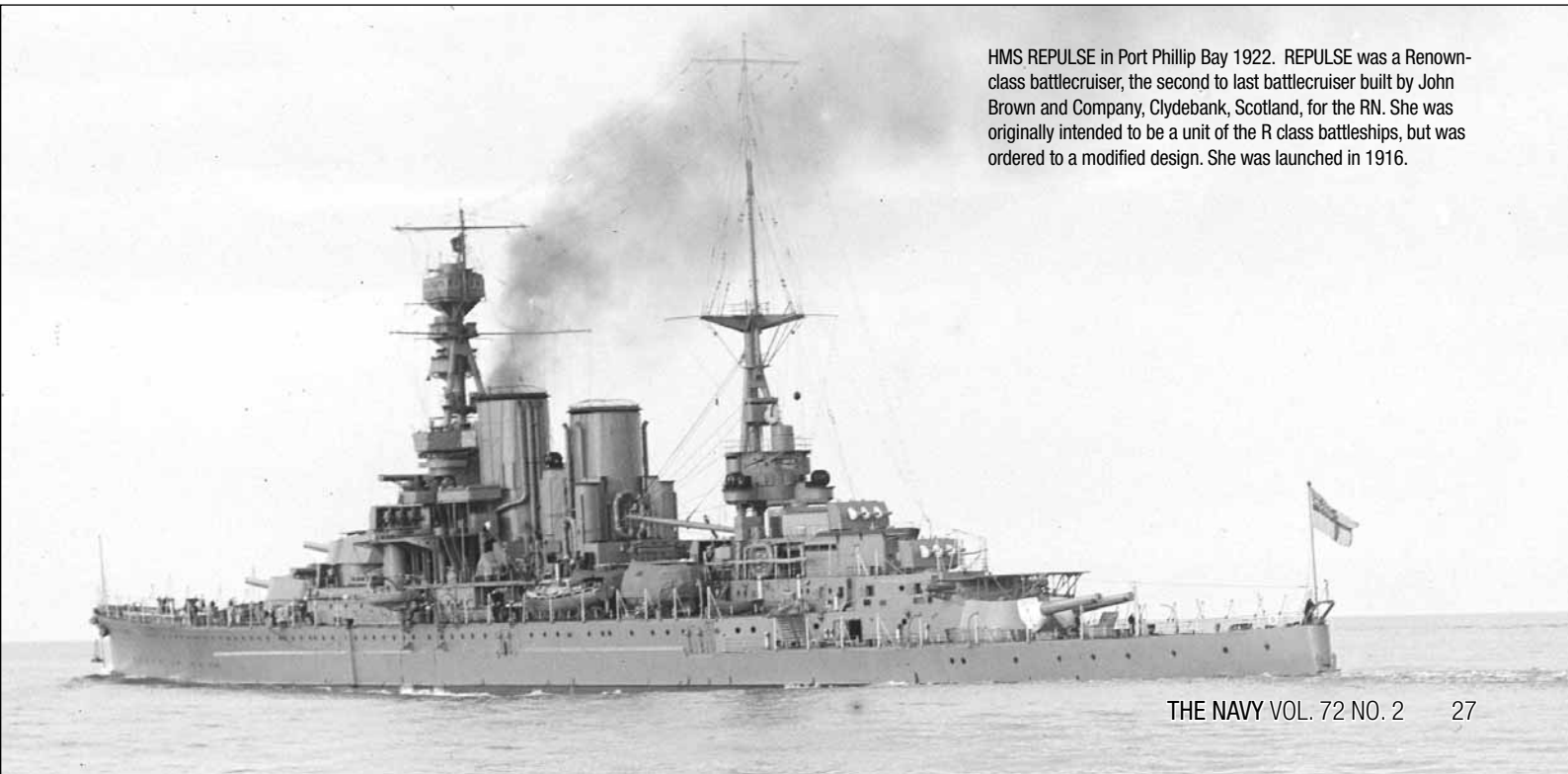
These tensions and ambitions were broadly known in the West. As a deterrent to precipitate action by the Japanese, Churchill proposed in late 1941 that a small, fast force of capital ships be based at the naval base of Singapore. The strategic intention was that such a force would be a deterrent by its mere presence – like the German battleship TIRPITZ in Norway, tying down a disproportionate strength of the opposing navy. The small force was a necessity borne of Royal Navy commitments in the Mediterranean, Atlantic and home waters, where the outcome of the war at sea was anything but decided. It was known as Force Z.

THE COMPOSITION OF FORCE Z

Force Z, as it sailed from Singapore on the afternoon of the 8th of December, consisted of the modern battleship PRINCE OF WALES, the aged battlecruiser REPULSE, and four destroyers, including the Australian VAMPIRE. The destroyers were destined to be bit players in the coming drama, with one returning to Singapore early due to low fuel stocks.

Accompanying this force should have been the new aircraft carrier INDOMITABLE, but she was damaged by grounding whilst working up off Jamaica and was thus unavailable. Due to the parlous state of land-based RAF resources in south-east Asia, Force Z thus sailed without any effective air cover.

The presence of a carrier with a squadron each of Fairy Fulmar and Hawker Sea Hurricanes would have made some difference to the defensive



HMS REPULSE in Port Phillip Bay 1922. REPULSE was a Renown-class battlecruiser, the second to last battlecruiser built by John Brown and Company, Clydebank, Scotland, for the RN. She was originally intended to be a unit of the R class battleships, but was ordered to a modified design. She was launched in 1916.

capabilities of Force Z. However, the British fighters would have been no match for the Mitsubishi A6-M Zeke, the best carrier-borne fighter in the world in 1941. Whilst perhaps avoiding disaster on the 10th of December, the short-term prospects for Force Z would still have been grim.

The key specifications for the capital units were:

PRINCE OF WALES

Completed 1941
Displacement: 35 000t
Speed: 27.5 knots
Armour: 15" belt, 6" deck
Armament: 10 x 16"; 16 x 5.25" dual-purpose
48 x 2-pounder pom-poms; 1 x 40mm Bofors; 7 x 20mm Oerlikons

REPULSE

Completed 1916
Displacement: 32 000t
Speed: 30 knots
Armour: 9" belt, 5" deck
Armament: 6 x 15"; 6 x 6" low angle; 6 x 4" high angle; 24 x 2-pounder pom-poms; 8 x 20mm Oerlikons; 8 x 0.5" machine guns.

THE SINKING OF FORCE Z

PRINCE OF WALES and REPULSE, accompanied by four destroyers, arrived in Singapore on the 2nd of December, 1941. At this stage they were redesignated Force Z. The force was commanded by Admiral Sir Tom Phillips, flying his flag in PRINCE OF WALES, with Captains Leach and Tennant in command of PRINCE OF WALES and REPULSE respectively.

Admiral Phillips flew to Manila, where he discussed strategy with the American General MacArthur, to whom he admitted the inadequacies of his force if hostilities with Japan were to commence. He then returned to Singapore from where, because of perceived rising tensions with Japan, he recalled the REPULSE which had just departed on a "show the flag" visit to Darwin.

Singapore woke on the morning of the 8th of December to an air raid by Japanese planes. Throughout the morning word filtered through of the Japanese attack on Pearl Harbor and landings taking place on Malaysian soil. At about noon a signal from the Admiralty reached Singapore – "Commence hostilities at once". Admiral Phillips proposed to use his ships offensively to attack Japanese invasion convoys in the South China Sea, so at 1710 on the 8th of December, Force Z left Singapore with the aim of attacking transport convoys off Singora on the 10th of December. Importantly, PRINCE OF WALES left with at least one of its radars non-functional.

Admiral Phillips had left Singapore underestimating two vital factors against him. He was known to underestimate the Japanese, believing them not to be skilled at modern warfare. He also underestimated the threat of airpower to ships, once having a "robust debate" with a senior RAF officer on the issue. His beliefs caused him to decline the offer of limited air support from the RAF and RAAF forces in the region, who were, however, too weak to provide round-the-clock aircover. As Flight Lieutenant Vigors of 453 Squadron, RAAF later commented, "'I reckon this must have been the last battle in which the Navy reckoned they could get along without the RAF. A pretty damned costly way of learning . . ."

As Force Z proceeded northwards on the 9th of December it was spotted by a Japanese submarine and shadowed. The 22nd Air Flotilla was notified at its bases near Saigon. Further reports were made from three seaplanes that spotted and shadowed the force before dusk on the ninth.

Knowing he had been detected, Admiral Phillips decided not to attack

HMS PRINCE OF WALES 1941. PRICE OF WALES was a King George V-class battleship of the Royal Navy, built at the Cammell Laird shipyard in Birkenhead, England.

Singora, and turned temporarily southwards to confuse the shadowers during darkness. During the night a flare was dropped over nearby Japanese ships by one of the seaplanes which had mistaken them for the British fleet. This flare was sighted by the British, with Admiral Phillips believing it signified a further loss of any element of surprise. He cancelled the operation, and set course to return to Singapore.

On the early morning of the tenth, Force Z was located again by submarine and from 0630 shadowed by aircraft. Admiral Phillips responded to reports of landings at Kuantan on the east coast of Malaysia by launching a reconnaissance aircraft at 0718, also sending a destroyer to investigate and turning the fleet in that general direction. Nothing was found, so the fleet turned south again for Singapore. At 1015 the fleet spotted, and was spotted by, another shadowing Japanese plane. The men of Force Z were not to know that their desperate hour was approaching.

The air attacks on Force Z opened at 1113 with a high level attack by eight Nell twin-engine bombers carrying 500kg and 250kg bombs. REPULSE rocked from at least eight near-misses and then was hit in the hangar area by a 250kg bomb – which caused casualties, but little impaired the

Admiral Sir Tom Phillips (right), commander of Force Z, and his deputy, Rear Admiral Arthur Palliser, on the quayside at Singapore naval base, 2 December 1941.

ship's fighting ability. The next attack developed at 1140 – sixteen Nells, this time equipped as torpedo bombers, and concentrating on the PRINCE OF WALES. Unmolested by any defending aircraft, they were able to co-ordinate and form up outside of the defensive anti-aircraft artillery range. The attack was pressed home against the defensive fire from the PRINCE OF WALES (just one plane was shot down), and a torpedo hit was scored on the battleship.

The effects of this one hit were devastating. The torpedo hit near where the 'A' bracket supported the port outer propeller shaft, ripping the bracket away from the hull. The shaft was bent and flexed, with the propeller flailing through hull plates, and the flexing shaft destroying the glands that kept water out of the shaft tunnel, flooding back into the port engine room. With stern bulkheads also damaged, the ship quickly took on 2400 tonnes of water.

This one hit had crippled PRINCE OF WALES as an effective fighting unit. An engine room, boiler room, two machinery rooms and a dynamo room were flooded, as well as stern compartments. The ship had lost most electrical power to the rear half of the ship, with half the secondary anti-aircraft battery powerless, and some of the 16-tonne, 8-barrel pom-poms forced into manual train mode – no easy task with the ship now listing 11.5° to port. The list also would prevent those starboard secondary battery turrets still able to train (the forward two) unable to target torpedo bombers due to the guns not being able to depress low enough.

Power was also cut to pumps, lights, communications, ventilation fans and steering gear. Speed had also been cut to fifteen knots, with only the starboard shafts in use. The ship was not sinking yet. However, her ability to defend herself was severely compromised and equally importantly the ability of damage control parties to deal with flooding from further battle damage was limited.

No respite was to be granted to PRINCE OF WALES. At 1230 another torpedo attack developed, with the crippled ship receiving three hits in quick succession – at the bow, stern, and under the bridge, all on the starboard side. She was now doomed.

The ship was struck by one bomb from a high level attack at 1241, causing heavy casualties. The order to abandon ship was given, the destroyer EXPRESS came alongside to rescue survivors – and at 1318 the PRINCE OF WALES rolled to port and sank, 327 men including Admiral Phillips and Captain Leach dying with her.

And what of the REPULSE? At 1156, with PRINCE OF WALES crippled, the next Japanese torpedo attack was against REPULSE. However, Captain Tennant proved to be a doughty opponent. Manoeuvring his ship more like a destroyer than a battlecruiser, Captain Tennant's twisting and turning avoided all eight torpedoes. One of the survivors noted "In our elevated position on the High Angle director the roll of the ship was alarming. If it hadn't been for the life-threatening situation it could almost have been exhilarating."

The ship also avoided a high level attack shortly afterwards. However, at 1217 a further attack by twenty-six torpedo bombers developed. The gallant Captain Tennant had avoided a total of nineteen torpedoes and his crew had shot down two attackers when in his words "I found dodging the torpedoes quite interesting and entertaining, until in the end they started to come in from all directions and they were too much for me".

His ship was at last cornered and hit by two, possibly four, torpedoes. The REPULSE, without the stout internal subdivision of a modern battleship (such as was keeping PRINCE OF WALES afloat), suffered rapid uncontrollable flooding. The ship developed an increasing list to port, and at approximately 1235 turned over and sank. This rapid sinking resulted in a greater loss of life than in the PRINCE OF WALES, with 513 lost.

The three destroyers worked for two hours amongst the oil-stained ocean rescuing survivors from the two ships. Then, with each of their decks crammed with hundreds of survivors and mercifully unmolested by air attack, the destroyers returned to Singapore. Approximately 900 survivors were rescued from the REPULSE (with the VAMPIRE picking up Captain Tennant) and 1200 rescued from the PRINCE OF WALES.

HMS REPULSE leaving Singapore on her last mission.

LESSONS LEARNT FROM THE FATE OF FORCE Z

Japanese naval aviation was a first-class weapon

Before December, 1941, the state of Japanese naval aviation was an unknown quantity to the Western Allies. This lack of knowledge was reinforced by racist perceptions such as HM Government's Naval Attaché to Tokyo reporting in 1935 that, "the Japanese have peculiarly slow brains." The sinking of Force Z dispelled these myths, with the realisation that Japanese military aviation was first-class in men and material. Aircraft, munitions and tactics were equal or superior to their Western equivalents, and crews were highly skilled and well trained. As one veteran officer of REPULSE was heard to say with dismay, "the Germans have never done anything like this in the North Sea, Atlantic, or anywhere else we have been".

Battleships and battlecruisers were fatally vulnerable to air attack.

The PRINCE OF WALES was a member of the RN's most modern class of battleship. Whilst the REPULSE was a 25-year-old battlecruiser with acknowledged poor AAA (anti-aircraft artillery) and deficient anti-torpedo protection, PRINCE OF WALES, only in commission for one year, was designed to repel air attack. She had vertical sandwich armour to contain torpedo damage and a high armoured dock to defeat armour-piercing bombs. A highly regarded dual-purpose secondary battery of 5.25" guns and light automatic AAA of 48x2-pounders were augmented by the wartime addition of one 40mm Bofors and 7x20mm Oerlikons. Search radar would also alert the crew to impending air attack.

History also appeared to be on the PRINCE OF WALES' side. Whilst battleships had been sunk by air attack at Toronto and Pearl Harbor, these were ships moored at anchor, and unable to manoeuvre. The largest ship to date sunk at sea had been a cruiser. There were still senior naval officers, such as Admiral Phillips, who believed the air threat to modern battleships at sea had been overstated.

The sinking of Force Z dispelled those illusions.

The mantle of most valuable naval asset passed to the aircraft carrier, which could hit targets repeatedly at many times the range of the big gun. The battleship was gradually relegated to shore bombardment and carrier escort duties – an important but vulnerable asset, requiring air protection.

The AAA of Royal Navy capital ships was inadequate

Whilst it was not surprising that REPULSE was eventually overwhelmed by determined air attack, the inability of the PRINCE OF WALES to initially keep attackers "at arm's length" was disappointing.

The performance of the 5.25" dual-purpose weapons on the PRINCE OF WALES was not up to expectations.

The cramped gunhouse and heavy round for manual loading exhausted the crews in the tropical heat, with the predicted sustained firing rate of ten to twelve rounds per minute per barrel reduced to seven or eight rounds per minute. The turret traverse rate of 10° a second was too slow to track modern, high-speed aircraft. The mount's inability to depress proved disastrous when the PRINCE OF WALES listed heavily to port, with the starboard battery then unable to engage low-flying torpedo bombers.

The light automatic weapon suite was also disappointing. The multi-barrel 2-pounder pom-poms suffered numerous stoppages due to the deterioration of the fabric ammunition supply belts in tropical conditions. The mount also proved cumbersome and slow in tracking, and nearly impossible to handle in manual mode with the ship listing. In fact, the surviving PRINCE OF WALES gunnery officers considered the single 40mm Bofors mounted on the quarterdeck (which suffered no stoppages) to be more useful than the 48 pom-poms combined.

These inadequacies were recognised and addressed by the Royal Navy. Table 1 shows the light automatic weapon suites of the December 1941 PRINCE OF WALES as compared to a 1945 sister King George V.

Table 1 Light Automatic Weapons

Weapon	PRINCE OF WALES, December 1941	KGV Class, 19450
2-pounder pom-poms	48	72
40mm Bofors	1	10
20mm Oerlikon	7	36
Total Light AAA	**56**	**118**

By 1945, all navies' AAA were vastly augmented – but not even more than 130 weapons could save the largest battleship ever built, the IJN YAMATO, from being overwhelmed by air attacks in 1945.

Australia Must Turn to the USA for Salvation

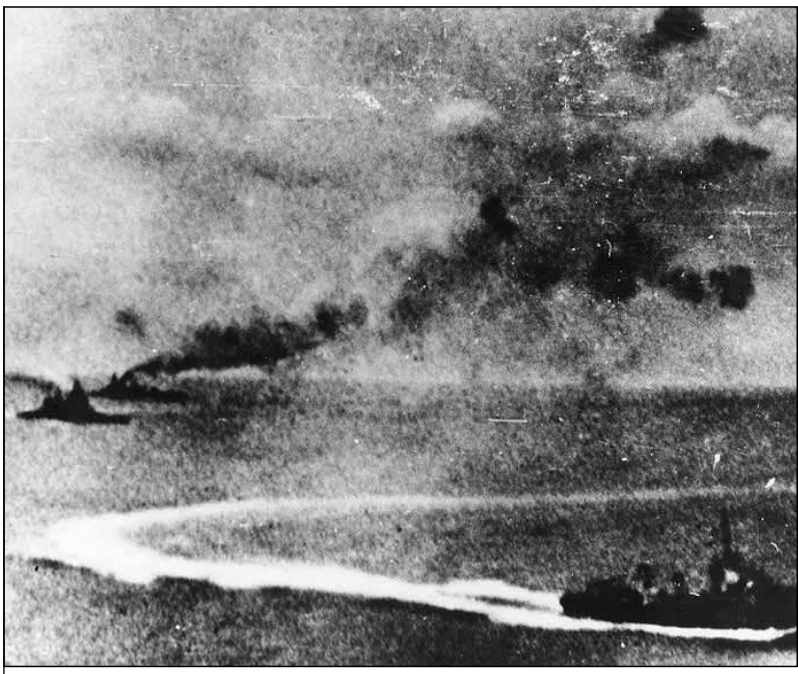
The sinking of the REPULSE and the PRINCE OF WALES left the largest Royal Navy ship in the Pacific as the heavy cruiser EXETER – soon to be sunk herself in the disastrous Java Sea battles. As the Japanese swept down through Malaya, Singapore and the East Indies, into Papua New Guinea and across the Pacific, the only force capable of halting the Japanese Navy were the USN carrier task forces.

Prime Minister Curtin wrote his 'Australia looks to America' essay and drafted his 'Speech to America'. The eyes of Australian leaders and her people had started to turn to the USA and away from the old ties of Empire.

AFTERMATH

The Japanese airmen were justifiably proud of their achievement. However, in the words of one crewman, "When we read about all those English seamen who shared the fate of their ships, we prayed for heir souls."

It was in this spirit that an aerial veteran of the sinking, Lt. Iki Haruki, on the 11th of December flew again over the scene of the sinking and dropped two wreaths – one for the eight Japanese who had died, and one for the eight hundred and forty British.



Combat footage from Force Z's last action. PRINCE OF WALES can be seen on the extreme left heading towards the right of camera. REPULSE is outboard of her heading in the opposite direction. In the foreground to the right is either HMS EXPRESS or HMS ELECTRA.

Z 6:Japanese combat footage of PRINCE OF WALES and REPULSE under air attack..

BOOKS

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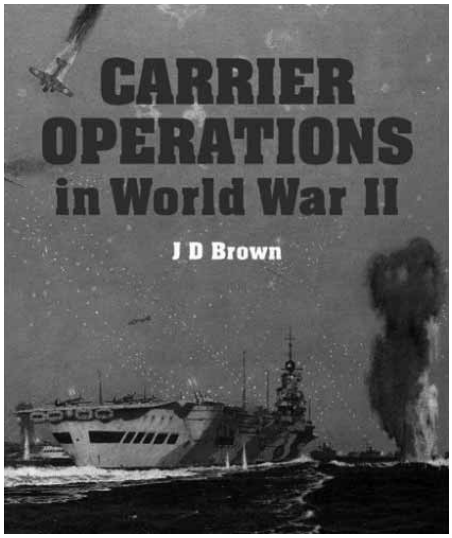
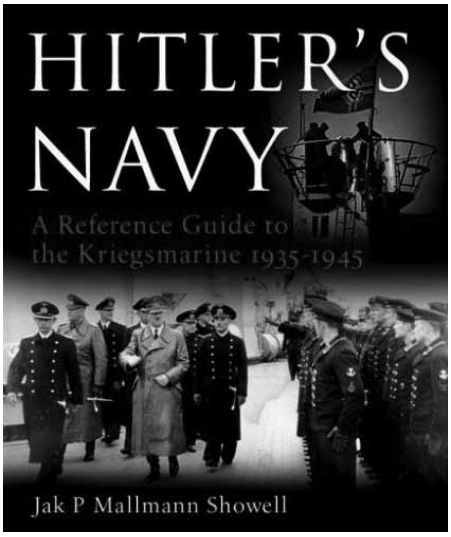
The Royal Navy's Fleet Air Arm grew from a small force into a powerful strategic weapon during World War II, with British carrier-based aircraft fighting throughout the world. This complete history describes their activities in the Home, Mediterranean, Eastern, and British Pacific Fleets, together with forces created for specific operations, and lists aircraft and units embarked during the various phases. The author also covers carrier operations in the Pacific between 1941 and 1945, noting that both the U.S. Navy and Imperial Japanese Navy watched the Royal Navy's early carrier operations in the European Theatre and benefited from the lessons. This work combines material from two earlier studies by J. D. Brown and adds information the author was compiling for a third volume at the time of his death.

J. D. Brown, a Fleet Air Arm carrier pilot and head of the Naval Historical Branch after his retirement, is the author of official histories and a number of well-received books.

The book has been brought together by Navy League member, former Aerospace Journalist of the year and former curator of the RN Fleet Air Arm Museum at Yeovilton CDR David Hobbs MBE, EN (Rtd) from J.D Brown's notes and unpublished research.

Thoroughly recommended.





Hitler's Navy: A Reference Guide to the Kriegsmarine, 1935-1945

By Jak P. Mallmann Showell (Author), Gordon Williamson (Contributor)
Hardcover: 224 pages

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Review by Ned Middleton

At first glance, this book looks every inch a 5 Star product and the content goes on to match that early expectation. Lessons are learned from the outset and much is explained in a manner which will not disappoint either the casual reader or the serious historian. In short, this work is not just another book about the Kriegsmarine, it is one in which Hitler's Navy is explained like never before. Many popular myths are exploded, many misconceptions corrected and all are replaced with a rational, factual assessment and explanation based on the dedicated and detailed research of a competent maritime historian.

The inclusion of a most useful resumé of the Treaty of Versailles very early in the work (page 11) does much to help the reader understand the limitations imposed upon Germany's forces, especially her Navy, after WW1. These were the very seeds from which the Kriegsmarine evolved and provides a vital to understanding of how, for example, the concept of the Pocket Battleship was born and of other circumstances which existed. Elsewhere, I was fascinated to learn how one unit of Hitler's Kriegsmarine was never disbanded but continued to serve in mine clearance duties until it eventually became part of Germany's post-war Navy.

The men, uniforms, flags, awards, organisation, bases and buildings, command and rank structure and of course the ships and U boats are all included in great detail. And when I say great detail, each aspect is tackled from a number of different perspectives in order to provide the most complete account.

When it comes to research, there are those who believe one or two trips to the local maritime museum is suffice, those who believe the answers are found on the internet, those who can't be bothered and those who choose to invent their own data in a bid to pass them off as facts (I kid you not!). Why? Because real research takes years and most people can't be bothered. In the case of this author, however, Jak Mallmann Showell has a solid reputation for accuracy of detail which has been achieved through many years of "research, research and even more research." It is because he has a complete appreciation of this aspect of his work "and" knows how and where to find the answers, that he is able to present the world with such an important document as this. Important, not only because it is the definitive work but also because it corrects so many previous misconceptions.

Altogether, this is a comprehensive account. Commencing well before the Kriegsmarine was established and ending long after it ceased to exist, this is, as I say, a complete account of "Hitler's Navy."

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.
- Endorses the control of Coastal Surveillance by the defence force and the development of the capability for patrol and surveillance of the ocean areas all around the Australian coast and island territories, including the Southern Ocean.
- Advocates measures to foster a build-up of Australian-owned shipping to support the ADF and to ensure the carriage of essential cargoes to and from Australia in time of conflict.

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 Government's decisions to acquire 12 new Future Submarines; to continue building the 3 Air Warfare Destroyers (AWDs) and the two landing ships (LHDs); and to acquire 8 new Future Frigates, a large Strategic Sealift Ship, 20 Offshore Combatant Vessels, 24 Naval Combatant Helicopters, and 6 Heavy Landing Craft.
- Noting the deterrent value and the huge operational advantages of nuclear-powered submarines in most threat situations, recommends that some of the proposed Future Submarines should be nuclear-powered.
- Noting the considerable increase in foreign maritime power now taking place in our general area, advocates increasing the order for Air Warfare Destroyers to at least 4 vessels.
- Welcomes the decisions to increase the strength and capabilities of the Army and Air Force and to greatly improve the weaponry, and the intelligence, surveillance, reconnaissance, cyberspace, and electronic warfare capabilities of the ADF.
- Advocates that a proportion of the projected new F35 fighters for the ADF be of the short-takeoff and vertical-landing (STOVL) version to enable operation from small airfields and suitable ships in order to support overseas deployments where access to secure major airfields may not be available.
- 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.
- 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.

An SM-2 anti-aircraft missile leaves the Mk-13 launcher of the upgraded FFG HMAS MELBOURNE for the first time (see Flash Traffic pp 15-16 for more details). (RAN)

The bow of the Anzac class frigate HMNZS TE MANA with HMAS DARWIN in the background during the recent Ocean Protector exercise off the NSW coast. (RAN)

The Malaysian missile corvette KD LAKSAMANA TAN PUSMAH seen here during the LIMA 09 defence show at Langkawi in Malaysia. Malaysia has four of these corvettes which were originally destined for the Iraqi Navy before Gulf War I. (Chris Sattler)

The new Malaysian Scorpene class submarine KD TUNKU ABDUL RAHMAN at the LIMA 09 Defence show at Langkawi in Malaysia. Malaysia has another of these very new and advanced diesel electric submarines due to be delivered shortly. (Chris Sattler)