

THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

**THE RAN's
CENTENARY**

**NIITAKAYAMA
NOBORE'**

**THE IMPERIAL JAPANESE NAVY'S
ATTACK ON PEARL HARBOUR**

**STRONGER SHIPPING
FOR A STRONGER
AUSTRALIA**

**ELECTRONIC
RESURGENCE**



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THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

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Front cover:

The USN's multipurpose LHD USS MAKIN ISLAND with her five embarked USMC Harrier II+ aircraft parked at the stern. 2011 has been the year of the aircraft carrier (LHDs included). See our From The Crow's Nest for more details. (USN)

THE YEAR OF THE AIRCRAFT CARRIER

This year has been a big year for the aircraft carrier in many navies around the world with contracts, launches, commissionings, decommissionings and operations.

It started with the signing of an agreement between France and Russia for two 21,000 tonne French Mistral class multipurpose LHDs. These ships will represent a quantum leap for Russia's amphibious warfare capability, with the potential for at least three more.

In February the 26,000 tonne multipurpose LHD, CANBERRA, was launched for the RAN in Spain. While the keel of ADELAIDE, the RAN's second LHD, was laid down almost immediately after.

In the US the first steel was cut for the new 101,000 tonne Gerald R. Ford class aircraft carrier, USS JOHN F. KENNEDY for the USN.

In March the new 44,750 tonne Indian aircraft carrier VIKRAMADITYA (ex Soviet Kiev class carrier ADMIRAL GORSHKOV) started its harbour trials. VIKRAMADITYA has been modified with arrestor gear and a ski jump to allow for STOBAR (Short Take Off but Arrested Recovery) operations for up to 24 MiG-29K fighters. The carrier is expected to start sea trials in November. While India's second indigenously built 40,000 tonne Project 71 carrier INS VISHAL will be laid down this year.

In July the French Navy's third Mistral class multipurpose LHD, DIXMUE, arrived in Toulon for fitting out and the start of harbour trials.

August saw the long awaited saga of the ex-Soviet VARYAG finally come to an end with the ship completing its reactivation in China and putting to sea for builders trials as part of the People's Liberation Army – Navy (PLA-N). The 60,000 tonne ex-Soviet carrier has been renamed SHI-LANG, after the last Chinese General to conquer the island of Taiwan. She will embark the formidable Su-33 strike fighter. Her presence in and around the region may be the start of a regional arms race which Australia will need to watch carefully.

In December India is expected to launch its first indigenously built 40,000 tonne project 71 aircraft carrier VIKRANT.

The 'odd man out' in all of this, but still contributing to a year of aircraft carrier events, was the UK. March saw the UK decommission its only strike carrier HMS ARK ROYAL, after Britain's entire GR-9 Harrier fleet was disbanded to save costs, despite going through a recent expensive and sophisticated upgrade and with over 10 years left in the airframe.

In June the UK's decommissioned aircraft carrier INVINCIBLE, an important Falklands conflict veteran, was ignominiously hauled onto a beach in Turkey and ripped apart for scrap. While sister ship HMS ILLUSTRIOUS started her sea trials after a lengthy refit and modernisation, only to face early decommissioning in a few years, again to save money.

The UK's actions on ARK ROYAL and Harriers, to save costs, ironically ended up costing more when the UK deployed off the Libyan coast. Instead of a carrier to provide on the spot and at call air support to the mission, the UK was left with lengthy and expensive transits from the UK by RAF Tornado strike aircraft and expensive deployments to bases in Italy for RAF Typhoon fighters, none of which could provide the at call responsiveness only carrier borne aircraft can. To add insult to injury the GR-9s' impressive ground attack capabilities would have been ideal over Libya. Instead the UK took the very risky step of using army attack helicopters as quasi-strike platforms, something they were never designed for.

The NATO led operation Unified Protector off the Libyan coast also contributed to the case for 2011 being the year of the aircraft carrier. The US Government's decision not to participate with its 100,000 tonne super carriers off Libya meant the operation had to be prosecuted from the decks of two smaller aircraft carriers and three multipurpose LHD/LPH type vessels. This operational necessity inadvertently signalled the return to prominence of the small or light fleet carrier concept. These five vessels provided the bulk of NATO capability to enforce a no-fly zone, an arms embargo and provide close air support to rebel fighters on the ground.

The largest aircraft carrier used by NATO was France's 42,000 tonne CHARLES DE GAULLE. Launching supersonic Rafals and Super Etendards it was also the flagship of the naval task force.

Italy's 13,000 tonne GIUSEPPE GARIBALDI carrier, the smallest of the task force, used a force of eight Harrier II+ for combat air patrol, strike and close air support.

Three multipurpose amphibious ships also contributed to the campaign; the 40,000 tonne US Wasp class LHD KEARSARGE with its five Harrier II+ attack aircraft; the 21,000 tonne French Mistral class multipurpose LHD TONNERRE using Tiger and Gazelle attack helicopters; and the 22,000 tonne RN LPH HMS OCEAN using five Apache attack helicopters from the British Army.

However, for the smaller carriers and multipurpose amphibious ships to perform the tasks they required a fair amount of land based air support at the start of the operation. NATO E-3 Sentry Airborne Early Warning and Control Aircraft were deployed to manage much of the air campaign. Strikes from land based aircraft, such as RAF Tornados, French Mirage and US F-15E Strike Eagles and A-10 Thunderbolts, did manage to establish the permissive conditions through strikes on fixed and known targets that allowed the lower number of aircraft on the LHDs to perform their role well and bring victory to the rebels.

So from the year of the aircraft carrier there are lessons for Australia. The first is that the modern multipurpose LHD can do much more than just taxi an army around. If it were only used in that manner it would be a waste of taxpayer's money. Like its



The Italian 13,000 tonne light carrier GIUSEPPE GARIBALDI. Despite her size and her eight Harriers she provided an excellent capability against the Libyan military.

larger aircraft carrier cousins it can be quickly reconfigured for whatever mission is needed by what aircraft it embarks.

Navy and Army need to expand their 'doctrine development' earlier rather than later to encompass non-amphibious operations, in order to avoid situations like like France's and the UK's contribution off Libya - which had all the rushed, last minute haphazard- like qualities which could have led to a military disaster. The expansion of the number of multipurpose LHDs in the world's navies should also be noted as those navies may have already comprehended this lesson.

The second lesson is that capable fixed-wing aircraft are still vital to

prosecuting conflict, even if you avoid putting boots on the ground, which is currently the only purpose of Australia's LHDs. As we saw off Libya, attack helicopters from amphibious ships can be used for combat support and raiding like operations but only with dedicated and sophisticated fixed wing support to shape the strategic and tactical environment and maintain it (the USN and RN also fired a large number of Tomahawk cruise missiles into Libya at start of the operation).

So from the Libyan operation and the year of the carrier the ADF needs to have the difficult discussion with itself about other capability options for fixed-wing air support when out of RAAF range. Or stay at home. ■



The RN Multipurpose LPH HMS OCEAN with British Army Apache attack helicopters embarked. With ARK ROYAL and all the Harriers decommissioned the only thing the RN had to 'throw against Libya' during this year's operation was the Army's helicopters. (RN)



Still slightly recognisable here is the former HMS INVINCIBLE on a beach in Turkey being pulled apart for scrap.



NOTICE IS HEREBY GIVEN THAT THE

ANNUAL GENERAL MEETING OF THE NAVY LEAGUE OF AUSTRALIA



will be held at the Brassey Hotel, Belmore Gardens, Barton ACT **FRIDAY 28 OCTOBER 2011 AT 8.00 pm**

BUSINESS

- 1 To confirm the Minutes of the Annual General Meeting held in Canberra on Friday 29 October 2010
- 2 To receive the report of the Federal Council, and to consider matters arising
- 3 To receive the financial statements of the year ended 30 June 2011
- 4 To elect Office Bearers for the 2011-2012 years as follows:
 - Federal President
 - Federal Vice-President
 - Additional Vice-Presidents (3)

Nominations for these positions are to be lodged with the Honorary Secretary prior to the commencement of the meeting.

5 GENERAL BUSINESS:

- To deal with any matter notified in writing to the Honorary Secretary by 18 October 2011

ALL MEMBERS ARE WELCOME TO ATTEND

By order of the Federal Council

Philip Corboy
Honorary Federal Secretary

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NUCLEAR SUBMARINES

When the Defence White Paper was released in 2009 the most eye catching proposal was that to acquire 12 submarines.

While the League welcomed the submarine plan it differed on the question of propulsion. It was and is the League's view that at the very least the option of nuclear propulsion should remain under consideration. The White Paper merely contained a one line rejection of the possibility of nuclear propulsion.

I have on previous occasions raised this issue. Other members of the League, in *THE NAVY* and elsewhere, have continued to argue the case for nuclear propulsion.

It is of noteworthy that commentators whose background is more with economic or industry policy, rather than defence, are now starting to take an interest in the submarine programme.

What has caught attention is the quoted price for the 12 submarines – \$36 Billion. Given that the building programme will run from the 2020s to the 2040s the quoted price may be conservative.

Not surprisingly, commentators have been expressing concern about the cost. The argument is now being made that instead of building in Australia 12 yet to be designed boats, Navy should seek an off the shelf solution overseas.

The off the shelf solution has broadened discussion to take in more general industry policy. The question that has been raised is what defence equipment should or need be built in Australia. In this discussion cost saving is of course a significant factor.

So far as the submarine programme is concerned there may well be several options. To give one example, in the United States Virginia class

nuclear powered attack submarines are being built at the rate of two per year. The price per boat is USD \$2 Billion, and falling. These are proven boats being built now. Six such boats would probably meet the RAN requirement.

It is to be hoped that the Virginia class will now be considered by government when reviewing its defence plans.

The League looks forward to a continuing debate around our future submarine programme.

FROM RFA LARGS BAY TO HMAS CHOULES

Readers of *THE NAVY* will know that this magazine took a considerable interest in the possibility of the RAN acquiring RFA LARGS BAY. Indeed it is fair to say that this magazine strongly advocated the RAN acquiring the ship. When the decision to acquire the ship was made it was welcomed as "a magnificent addition to the RAN"

In the many words written over several editions of *THE NAVY* about LARGS BAY, one matter not touched upon was what name the ship would bear when commissioned into RAN service.

On the 18th August at Fleet Base West the Prime Minister and the Minister for Defence announced that "the ex Royal Fleet Auxiliary Landing Ship Dock LARGS BAY is to commission into the Royal Australian Navy as HMAS CHOULES"

It is no dis-respect to the late Chief Petty Officer Choules to say that this was something of a surprise.

The announcement of the ship's name included an explanation as to the choice of name. The explanation can be fairly summarised as follows:

Chief Petty Officer Choules passed away this year, the RAN's centenary

The Prime Minister, Julia Gillard and the Minister for Defence Stephen Smith announced at HMAS STIRLING that the RAN's newest ship will be commissioned as HMAS CHOULES. NUSHIP CHOULES is scheduled to arrive in Australia in December and will be commissioned into the RAN in Fremantle as HMAS CHOULES. HMAS CHOULES is expected to be operational in early 2012. (RAN)



year, at the age of 110. With his passing the world lost its last living link with those who served in WWI. Claude Choules was born in England two days after the birth of the Australian Navy in March 1901. Like the ship that will bear his name he started his naval service in the Royal Navy. He joined in 1916. He came to Australia on loan in 1926 and soon decided to transfer to the Royal Australian Navy. He was a member of the commissioning crew of HMAS CANBERRA. In 1932 he became a Chief Petty Officer Torpedo and Anti Submarine Instructor.

During WWII Claude Choules was the Acting Torpedo Officer in Fremantle and Chief Demolition Officer on the west coast. After the war he transferred to the Naval Dockyard Police. He finally retired in 1956."

No one would wish to demean or diminish the contribution made by Claude Choules over forty years in the Royal and Royal Australian Navies. But there was at least one obvious alternate name for the ship. That was LARGS BAY.

Certainly there are people, particularly in South Australia, who consider LARGS BAY should have been retained as the ship's name.

The South Australian Colonial Naval Headquarters were in the Naval Drill Hall at Largs Bay. The Naval Brigade trained at Largs Bay. The Largs Bay depot continued to be used after Federation until 1916, when a new

depot was opened at Birkenhead.

Largs Bay was Adelaide's original passenger port with passengers transported to and from ships via the jetty. Passenger trains ran onto the jetty. The Largs Pier Hotel was built to service the traffic. Largs Bay continued to be used until the Outer Harbour wharves were completed in the early 1900s.

The Commonwealth Lines Bay class ships had a particular connection with Australia. The *SS LARGS BAY* (a sister ship to the more famous *AMC JERVIS BAY*) made a number of wartime trips from Australia to Britain via North America. It carried many Australian servicemen, including RAAF personnel under the Empire Air Training Scheme.

Later in the war it was used by the Royal Navy as a command ship during landings in Italy, where it was badly damaged by German bombs.

The naming of ships can often be the subject of contention. However that may be, RFA LARGS BAY will hereafter be HMAS CHOULES. The ship is a welcome addition to our amphibious force. We look forward to it serving for many years in the Royal Australian Navy. ■

FROM OUR READERS



Dear Editor, NAVY DAY

I am writing in response to your request for suggestions towards a RAN specific date each year to focus upon our history. It must be said that anyone would be very hard pressed to convince the public to embrace a specifically naval commemoration with the level of enthusiasm and reverence the community currently accords 25 April and it would be folly to advocate distancing the RAN from ANZAC Day itself. The commemoration of naval service and sacrifice in conflicts past should remain part of both ANZAC and Remembrance Day proceedings, despite the heavily army orientated focus.

However I do believe that the Navy requires one day of the year on which to celebrate and promote its achievements and fortunately this day already exists on the RAN's commemoration calendar. 4 October 1913, the day the first Australian fleet unit entered Sydney Harbour, was celebrated by the RAN for many years as 'Navy Day'; but whilst still observed, perhaps requires some reinvigoration. Prior to the Gallipoli landings and subsequent myths emerging from them over the ensuing years, the public had looked upon the arrival of the ships of the Australian fleet as the day on which the new Australian nation came of age. On that day the responsibility for the defence of Australia and its waters, exercised by the Royal Navy since the beginning of European settlement,

was transferred to the Australian owned and controlled RAN answering directly to the Commonwealth Government. As opposed to the symbolic spilling of blood at ANZAC Cove, which incidentally neglects the memory of personnel killed in New Guinea and aboard Sydney at the Cocos Islands during 1914, one would be hard pressed to find an earlier significant military event in which Australia stood aside from, and independent of, the mother country and as such is worthy of celebration.

Though these facts will likely be lost on the wider Australian public schooled only in the events of 25 April 1915, there is no reason not to promote 4 October 1913 both within the navy as well as the general community to the best of the RAN's ability, not to mention that of its supporters, without the need to search for another date. As the current trend of reinterpreting and redirecting emphasis in history flourishes in the modern politically correct age, perhaps all we need to do is reinvigorate what the RAN has traditionally celebrated in its past.

PO Pete Cannon

Dear Editor, Close Air Support

I have followed with interest *THE NAVY*'s case for Close Air Support (CAS) to be deployed from the new CANBERRA class LHDs. The Libyan conflict has effectively demonstrated

that there is a requirement for "low and slow" CAS using helicopter-gunships operating from the amphibious assault ships HMS OCEAN and FS TONNERRE.

While it is effective, the WAH-64D Apache is a very expensive helicopter-gunship. In these economically straightened times, there appears to be a good case for a fixed wing aircraft that could undertake the same tasks as a helicopter-gunship but at a significantly lower cost. The Cresco agricultural aircraft manufactured by Pacific Aerospace Corporation Ltd. combines a short take off and landing performance with a large load carrying capability. This aircraft has a rugged tricycle undercarriage designed to operate off semi-prepared farm airstrips and is accordingly well suited for flight deck operations.

A naval version of the Cresco could provide CAS from the CANBERRA Class LHDs as well as other tasks such as anti submarine and anti surface vessel warfare (it is assumed that the RAN still has Penguin Mk 2 Mod 7 ASMs in its inventory). In summary, perhaps the Cresco has the potential to become the 21st Century equivalent of the venerable Stringbag (Fairey Swordfish).

**Kind regards
Murray Dear, Hamilton NZ**

ROYAL AUSTRALIAN NAVY CENTENARY

and 100th Anniversary commemorations of Navy's service to the nation

100 years

On 10 July 1911, King George V granted the title 'Royal' to Australia's navy. It was officially announced on 5 October 1911 and from that day on, Australia's 10 year-old Commonwealth Naval Forces became the Royal Australian Navy and its ships officially became His Majesty's Australian Ships.

But this declaration did far more than simply bestow a name and title. It conveyed a recognition by the sovereign before the whole British Empire and the world that Australia was coming of age as a maritime power and as a nation.

For an island nation at the farthest end of the British Empire, being able to take responsibility for its own defence — particularly the defence of its coastlines and the sea lines of communication on which it relied for its survival — was an absolute necessity.

That this declaration by King George V was followed up with the acquisition of a fleet that was powerful and capable by world standards further conveyed to the world that the fledgling young

nation of Australia was one that stood ready to take its place in the Empire, and in the world.

Earlier than many would have expected, Australia, her navy and military forces were called to do just that: in battle. The Royal Australian Navy's service in the First World War was exemplary and proved to the world that this former colonial outpost was indeed a nation and a considerable maritime power in the Pacific.

The 100th anniversary of these important milestones in our development as a nation are being celebrated and commemorated by the Royal Australian Navy, the Australian Defence Force and the nation as a whole.

Commemorations for 100 years of the Royal Australian Navy are being conducted throughout 2011. The 100th anniversary of other key milestones and events in Navy's history will be commemorated over the next four years culminating in the commemoration of the centenary of ANZAC in 2015. Together they aim to raise the national

Able Seaman Richardson (left) and Acting Sub-Lieutenant Griffin, RAN, attend the Centenary Royal Australian Navy Coin Launch onboard HMAS PERTH. The 100 years Royal Australian Navy Silver Proof Coin & Replica Badge Set was launched by the Perth Mint onboard HMAS PERTH on 3 February 2011. (RAN)





Able Seaman Combat Systems Operator Rebecca Florance with a special edition of the 'then and now' stamp that was launched at the Australian National Maritime Museum in Darling Harbour. (RAN)

consciousness of these early milestones in Australia's development as a nation and remind us again of the sacrifices made by so many to give us the free and prosperous nation we enjoy today. Key commemorative events are as follows.

COMMEMORATIVE COIN LAUNCH

On 3 February 2011, the Minister for Defence, Stephen Smith was joined by representatives from the Navy, the Perth Mint and local community onboard HMAS PERTH to launch a silver coin tribute to commemorate 100 years since the Royal Australian Navy was granted the 'royal' prefix.

The 99.9% pure silver numbered coin features images of sailors from the early days of the Royal Australian Navy, the River Class torpedo boat HMAS YARRA and the modern warship HMAS ANZAC, which is the third RAN ship to carry the name. The coin is complemented by a replica gold-plated navy badge.

No more than 7,500 of the coins will be minted.

NAVY FAMILY AND COMMUNITY DAY

The Royal Australian Navy held a day of celebrations at the Australian National Maritime Museum in Sydney's Darling Harbour on 12 June 2011 to commemorate 100 years since being granted the title 'Royal'. The event featured Sea King helicopter and navy diver demonstrations, flight simulators, RAN Band performances, children's activities, show bags, historical displays and a guest history presentation by navy's Senior Naval Historical Officer, Mr John Perryman.

BOOK LAUNCH: 100 YEARS OF THE ROYAL AUSTRALIAN NAVY

As part of the community day celebrations, the Chief of Navy, Vice Admiral Ray Griggs AM, CSC, RAN, launched a commemorative book entitled *100 Years of the Royal Australian Navy*.

The 300 page book contains over 50 articles, complemented by eye catching photographs, that have been compiled by leading naval historians, subject matter experts, commentators and serving personnel. It covers the Royal Australian Navy's extensive history and examines its involvement in conflicts including the First World War, Second World War, Korea, Malaysia, Indonesia, Vietnam and the Middle East. The book also looks at today's navy; its fleet, programmes and priorities.

Its dedicated articles on naval aviation, submarines, hydrographic services, border protection, clearance diving, peacekeeping, supply and logistics, engineering, health services and training provide valuable insights into the development of today's navy and its future.

In looking to the future, the book explores the future fleet and the technologies that will shape tomorrow's navy.

The online version of the book can be viewed at: <http://www.ran100.com.au/>

COMMEMORATIVE STAMP

Also launched at the community day was Australia Post's Royal Australian Navy 1911-2011 stamp issue. The stamp and book arrived in spectacular style, delivered by navy divers fast roping from the Sea King Helicopter onto the wharf at the Museum.

Described as 'then and now', the two stamp set comprises one stamp with an image of the battle cruiser and RAN flagship HMAS AUSTRALIA I with a Sopwith Camel overhead. The second stamp features the recently upgraded HMAS SYDNEY IV with an S-70 Seahawk helicopter overhead.

As well as the navy's ships and aircraft, the stamps also pay tribute to Navy's people.

Adorning the stamp featuring HMAS AUSTRALIA I is an image of Boy Seaman Frederick Mills, who served in AUSTRALIA when the battle cruiser was attached to the British Grand Fleet during the First World War. He was one of many boy seamen who supplemented AUSTRALIA's crew during the war and later died serving in HMS ACASTA. He was survived by his wife and his young daughter Barbara, who later followed in her father's footsteps by joining the Women's Royal Naval Service.

The contemporary stamp featuring HMAS SYDNEY IV includes an image of 21 year-old Combat Systems Operator Able Seaman Rebecca Florence, a recent crew member of SYDNEY. Her image represents the modern day RAN sailor, complete with combat uniform and a headset.

Barbara Gough and ABCSO Florence attended the official launch of the stamps, which are now available for purchase from Australia Post retail outlets, via mail order or on line from <http://shop.auspost.com.au>

PRIDE OF THE NATION EXHIBITION

From 8 July – 27 November 2011, Melbourne's Shrine of Remembrance is hosting the *Pride of the Nation* exhibition in its Eastern Visitors Centre.

Drawing extensively from the Naval Heritage Collection, this exhibition follows the formation and development of Australia's navy over the last 100 years. It recognises the notable service and sacrifices of those who have served at sea, in the 'silent service'.

The exhibition was opened by Chief of Navy, Vice Admiral Ray Griggs.

RAN BAND CONCERT: A NAVAL SALUTE

On 10 July 2011, the Royal Australian Navy Band presented a concert in the City Recital Hall in Angel Place, Sydney entitled A Naval Salute.

The concert used narrative and music accompanied by audio-visual presentations to convey the core messages about the history, current activities, future directions and values of the Royal Australian Navy.

The concert also included key elements of Navy's ceremonial repertoire with *Beat to Quarters*, *Man Ship*, *Cheer Ship* and *Ceremonial Sunset*.

The free public concert was well attended and included the Governor-General of Australia, Ms Quentin Bryce AC, the Governor of New South Wales, Professor Marie Bashir AC CVO, Chief of Navy, Vice Admiral Ray Griggs, veterans, representatives from ship's associations and current and former naval personnel and members of the public including young men and women from the Northern Territory involved in Defence's Indigenous Pre-recruitment Programme.

Other commemorations were held around the country including the dedication of a navy memorial plaque organised by the St Marys Centenary Committee in Brisbane.

10 July 2011 was a busy day at sea with the fleet involved in Exercise *Talisman Saber* off the Queensland coast and ongoing border protection and middle east area operations. The few ships alongside and all commissioned establishments marked the 100 th anniversary day with the traditional 'dress ship'.



A representative from Faircount Media presents Chief of Navy, Vice Admiral Ray Griggs, AM, CSC, RAN with a copy of '100 years of the Royal Australian Navy' at the Australian National Maritime Museum in Darling Harbour. (RAN)



Commander Greg Swinden (left) and Able Seaman Stores Naval Mark Hibbens at Al Minhad Air Base in the UAE celebrate the 100th Anniversary of the creation of the RAN with a cake cutting in the Combined Mess. At Al Minhad Air Base some 30 Navy personnel are carrying out a myriad of tasks in support of Australian Defence Force operations both at sea and on land in the Middle East. (RAN)

TIME CAPSULE

On 13 July, a time capsule that was buried at HMAS STIRLING on the occasion of the RAN's 75th anniversary was exhumed and new historical artefacts added. The event was marked by members of HMAS STIRLING's ships company, together with representatives from stakeholder organisations and the community.

The capsule is now being returned to the ground to be re-opened in 2036; 50 years after the RAN 75th anniversary celebrations.

FREEDOM OF ENTRY TO THE CITY OF DARWIN

The top end held a week of navy celebrations and this included a Freedom of Entry march by officers and sailors of HMAS COONAWARRA and HMAS DARWIN through the streets of Darwin on 30 July.

SHIP VISIT TO MELBOURNE

During 3-7 August HMA Ships PERTH, NEWCASTLE and SIRIUS visited Melbourne and were warmly welcomed by the local community. The visit included a ship open day, cadet visits, Defence Force Recruiting displays and media interviews with navy people and broadcasts from onboard.

THE VERNON PARKER ORATION RAN CENTENARY ADDRESS

On 4 August 2011 Rear Admiral James Goldrick AM, CSC, RAN presented an RAN Centenary Address at the Australian Naval Institute's annual Vernon Parker Oration at the Australian Defence College in Canberra. It was entitled *From Fleet Unit 1909 to Force 2020: Abiding Themes and Recurrent Challenges in Australia's Endeavours*.

ROYAL AUSTRALIAN MINT COIN RELEASE

The Royal Australian Mint is releasing a set of six commemorative silver coins to mark the 100th anniversary of the Royal Australian Navy.

The coins depict six RAN ships that have served in the fleet during the last 100 years. Those ships selected represent as broad a cross section of the Navy as possible and include:

- HMA *Submarine AE2* - representing the RAN submarine arm and the RAN's early involvement in the First World War and at Gallipoli.

- HMAS *AUSTRALIA (II)* - representing the RAN in the Second World War and the Navy's important role in the Pacific War

- HMAS *SYDNEY (III)* - representing the Fleet Air Arm and the RAN's involvement in the Korean War and later the Vietnam War

- HMAS *YARRA (III)* - representing the RAN's involvement in the Malayan Emergency, Indonesian Confrontation and Far East Strategic Reserve

- HMAS *HOBART (II)* - representing the RAN's involvement in the Vietnam War and its entry into the missile age.

- HMAS *ARMIDALE (II)* - representing the patrol boat force, boarder protection duties and the small ships of the RAN.

Each coin depicts a silhouette of the vessels named above as well as its Battle Honour Board. The addition of the battle honours provides a direct link to other ships that have carried these names reinforcing the RAN's proud history and heritage. Packaging and the inclusion of a specially produced card containing a short précis of the history of each ship is also included in the release which is currently programmed for early-mid October.



On the occasion of the Governor General's Reception commemorating the Centenary of the Royal Australian Navy are from left, Rear Admiral Allan Du Toit AM RAN, Her Excellency the Governor of New South Wales Professor Marie Bashir AC CVO, Her Excellency the Governor General of Australia Ms. Quentin Bryce AC and Chief of Navy Vice Admiral Ray Griggs AM CSC RAN.

SIR DAVID MARTIN FOUNDATION NAVY CENTENARY BALL

The RAN Centenary will be celebrated in style at the Sir David Martin Foundation Navy Centenary Ball to be held on 5 November in the Great Hall of Parliament House, Canberra. The Sir David Martin Foundation charity supports youth in crisis to recover and rebuild their lives.

The charity was founded twenty one years ago by the much-loved Governor of NSW, Rear Admiral Sir David Martin, days before his death in 1990. Sir David was one of Navy's most respected leaders who had a vision of 'safety, hope and opportunity' for Australia's young people.

Navy has actively supported this charity for the last 21 years through various activities since its establishment.

This gala ball will feature the Royal Australian Navy Band and a variety of entertainers.

UPCOMING 100TH ANNIVERSARY COMMEMORATIONS- REMEMBERING OUR FIRST FLEET AND SERVICE TO THE NATION

2012: 100 years of chaplaincy and Rugby

There are two important anniversaries that will be marked in 2012: the centenary of RAN Chaplaincy services and of RAN Rugby.

Chaplaincy services play an important role in supporting RAN personnel and their families from the 'cradle to the grave', with RAN chaplains performing Christenings, weddings, funerals and committal services for navy personnel and their families. The emotional support, counselling and spiritual guidance of chaplains is particularly valued by RAN personnel when deploying to a theatre of conflict, with all of the uncertainty such a deployment can bring.

The hundred years of these valuable services is planned to be celebrated with the launch of an RAN Chaplaincy historical book.

RAN Rugby has played an important role in fostering teamwork, camaraderie and physical strength and fitness among RAN personnel. The healthy rivalries built up between RAN and inter-service rugby teams are often a morale booster, and the competition provides valuable relief for players and spectators alike from the often arduous life at sea with its long periods of separation from families and loved ones.

This important aspect of service life will be celebrated with a special 2012 Commonwealth Navy Rugby Cup that is sure to be hotly contested.

2013 International Fleet Review

One of the most significant milestones for the Royal Australian Navy was the arrival of the fleet unit into Sydney Harbour, led by HMAS *AUSTRALIA*, on 4 October 1913. Preparations are underway to mark this momentous occasion with an international fleet review in Sydney Harbour from 4-11 October 2013. The International Fleet Review is set to be a spectacle Sydney—and Australia—will never forget. The week-long program of activities will be a national celebration to mark Australia's progress as a nation and is planned to begin with ships from the RAN and visiting nations entering



Mayor of Rockingham, Barry Sammels (left) and Captain Brett Wolski, RAN, Senior Naval Officer Western Australia, raise the time capsule. In 1986, a time capsule comprising a hollow 5-inch shell with various items enclosed was laid to rest in a vault located at the rear of the Quarterdeck onboard HMAS STIRLING. The capsule holds memorabilia from HMAS STIRLING from 1986, including photographs and a letter from the Commanding Officer addressed to the 2011 Commanding Officer. The time capsule was lowered again and holds memorabilia of HMAS STIRLING as it is today as well as a letter to the Commanding Officer in 2036. (RAN)

Sydney Harbour on 4 October ahead of a fleet review the following day. There will also be a series of sporting, cultural, ceremonial, historical and public relations activities that will invite community engagement. Tall ships from visiting nations will join ships from Australia, including STS YOUNG ENDEAVOUR and the Australian Surf Boat Rowers for a fantastic display of activities on the harbour. An international sea power conference in Sydney will coincide with the International Fleet Review and opportunities for maritime training exercises and port visits by visiting ships before or after the International Fleet Review are being explored.

Navy will announce more details about the program closer to the event.

2014: Remembering a fateful year.

1914 was a fateful year for the new Royal Australian Navy, as tensions grew in Europe, ultimately drawing the world into the First World War.

100 years of the RAN Submarine Service

The RAN's first submarines, *AE1* and *AE2* were commissioned in February 1914, marking the beginning of the RAN Submarine Service. Planning is underway to mark this occasion with celebrations, port visits and exhibitions near the home of Australia's submarine squadron in Western Australia.

The Australian Naval and Military Expeditionary Force

The Australian Naval and Military Expeditionary Force (AN&MEF) was a small volunteer force of approximately 2,000 men, raised in Australia shortly after the outbreak of the First World War to seize and destroy German wireless stations in German New Guinea in the south-west Pacific. Britain required the German wireless installations to be destroyed because they were used by the German East Asian Cruiser Squadron of Vice-Admiral Maximilian von Spee which threatened merchant shipping in the region. Following the capture of German possessions in the region, the AN&MEF provided occupation forces for the duration of the war.

Loss of AE1

Tragically, in September 1914 during the AN&MEF operation, the Royal Australian Navy experienced its first loss at sea, with the disappearance of the submarine *AE1* in the waters off New Guinea. A tribute ceremony with the unveiling of a plaque to the *AE1* at Garden Island in Sydney will be held on 14 September 2011 with other ceremonies planned across Australia and overseas.

1914: RAN's baptism of fire

In the early hours of 9 November 1914, while escorting the Australian and New Zealand Expeditionary Force (ANZEF) convoy enroute to the Middle East, wireless operators detected a message from the Cocos Islands Wireless Telegraphy Station warning of a strange warship in the area. The cruiser HMAS SYDNEY I was detached to investigate and subsequently engaged the German cruiser EMDEN by 9:15am.

Despite enduring early hits, SYDNEY took advantage of her superior speed and firepower to disable the notorious cruiser, yet EMDEN's commanding officer, Captain Muller, continued the engagement. With his engine room on fire, third funnel gone and no hope of victory or escape, Muller ordered his ship onto the beach and was seen stuck fast on the North Keeling Island Reef at around 11am. He surrendered shortly after.

The battle brought to an end a voyage of destruction that had been wrought throughout the region by Muller and the EMDEN. The care rendered by RAN sailors to their defeated German counterparts earned them great respect from their enemies. The SYDNEY/EMDEN battle is planned to be remembered with a commemorative service on Cocos Islands near the site of the battle and a SYDNEY/EMDEN historical exhibition is planned to go on display at the RAN Historical Centre at Garden Island, Sydney.

The deployment of the ANZAEF convoy is planned to be marked with a port visit to Albany by RAN and international ships, re-enacting the departure of the convoy, possibly coinciding with exercises in the seas off Western Australia.

1915: Centenary of ANZAC

RAN 100 years celebrations will culminate with the nation-wide commemorations of the centenary of ANZAC in 2015.

The Gallipoli campaign had, as its primary objective, securing the Dardanelles to allow the British fleet passage to capture Constantinople (now Istanbul) through which ally Russia could better supply their troops in support of the overall campaign. The RAN played a role through the deployment of the submarine *AE2* and the Royal Australian Navy Bridging Train

On 25 April 1915, the Australian submarine *AE2* was ordered to attempt a passage through the Dardanelles and ordered to 'run amok' in the Sea of Marmara. By the evening of 26 April, *AE2* had endured

attacks from shore batteries and ships and navigated a minefield to passage through the Dardanelles and enter the Sea of Manmora—a feat no other allied submarine had previously been able to achieve. The success of Lieutenant Commander Stoker and his ship's company played a pivotal role in the decision to continue with the Gallipoli campaign despite the early heavy losses.

AE2 spent the next four days on patrol until the submarine was damaged when engaged by the Turkish Gunboat SULTAN HASAR. During the engagement AE2 became uncontrollable and Stoker had no alternative but to abandon and sink the AE2 to prevent its capture - at the time the AE2 was considered technologically advanced and Stoker did not want this to be revealed to the enemy. Stoker and all members of the AE2's ship's company survived the evacuation and were taken to a Turkish prison camp, where four sailors later died in captivity.

The Royal Australian Navy Bridging Train was an engineering unit comprised largely of naval reservists that specialised in pontoon bridging. The train was landed at Suvla Bay, north of ANZAC Cove on 8 August 1915. They set up a pontoon wharf under heavy enemy fire to enable troops and supplies to be brought ashore.

When the peninsula was evacuated on 20 December 1915, RANBT personnel maintained a wharf at the southern end of Suvla Bay over which the British rearguard would depart. The RANBT personnel were not evacuated until 4:30am on 20 December 1915, 20 minutes after the last Australian troops had left ANZAC Cove, making them the last Australians to leave the Gallipoli Peninsula.

The RAN's role in the Gallipoli campaign will be incorporated into the combined commemoration of the Centenary of ANZAC with special commemorative services planned for ANZAC Cove, as well as in Australia. An exhibition at the RAN Heritage Centre is also planned to explain the RAN's role in the First World War.

In an act of international friendship, the Royal Australian Navy's Sail

Training Ship YOUNG ENDEAVOUR is planning to visit Turkey as part of a world voyage involving youth from Australia and New Zealand. While in Turkey, STS YOUNG ENDEAVOUR will conduct sailing activities with Turkish youth.

A NATIONAL CELEBRATION

The four year programme of significant 100th anniversary commemorative events are set to be of national importance, a sentiment reflected in the words of Australia's Governor-General, Her Excellency Ms Quentin Bryce, AC:

'The history of Australia is shaped by the service of the men and women of the Royal Australian Navy who uphold the traditions of their predecessors, through bravery and resilience and a century of service and sacrifice.'

'As Commander-in-Chief, I commend the Service for its commitment to safeguarding our values and our way of life. It is with pleasure and great pride I share in the celebrations of the 100th anniversary of the Royal Australian Navy with all Australians.'

As well as raising awareness among Australians of the service rendered by the RAN over the last hundred years, these celebrations will also be a time of renewal for currently serving personnel, as the Chief of Navy, VADM Griggs said when launching 100 Years of the Royal Australian Navy book:

'As Navy marks its centenary, we renew our commitment to serve the Australian people with pride and to continue the history of the RAN.'

'It is this tradition of service which we hold fast as we enter the next generation of our fleet and face the many challenges it will bring.'



Chief of Navy Vice Admiral Ray Griggs AM CSC RAN unveils a bronze bust of former First Naval Member of the Naval Board (Chief of Navy) and father of the Royal Australian Navy Vice Admiral William Creswell KCMG KBE, at Catani Gardens in St Kilda, Melbourne. With Vice Admiral Griggs is Rosemary Creswell (wife of Vice Admiral Creswell's grandson - left) and Elizabeth Sevier (grandaughter of Vice Admiral Creswell - right). The bust was a result of the efforts of a small committee with a strong Navy League of Australia backing (namely the Victorian Division). The unveiling was part of the League's Victorian Division's celebrations of the centenary of the Royal Australian Navy. (RAN)

Visit the Royal Australian Navy's website at www.navy.gov.au to stay up to date with the latest news about the RAN Centenary celebrations in 2011 and navy's other upcoming significant 100th anniversary commemorations up to the First World War. ■

ELECTRONIC RESURGENCE THE US NAVY SHARPENS FOCUS ON DOMINATING THE ELECTRONIC BATTLESPACE*

By Richard R. Burgess

The USN is pushing ahead with a renewed emphasis on electronic warfare and has begun to recapitalise its fleet-wide tactical electronic surveillance and jamming capabilities to maintain its advantage over newer systems and missile seekers coming onto the market.

USN AIRBORNE EW

"Technology today is exploding all around us and there are huge leaps in technological capabilities that could be turned into weapons systems," said Rear Adm. Sean R. Filipowski, director of cyber, sensors and electronic warfare in the Office of the Chief of US Naval Operations.

The US Navy has begun a technology maturation phase in its effort to develop the Next-Generation Jammer (NGJ) — an airborne electronic attack system designed to replace the current ALQ-99 tactical jamming system — and is moving further in the Surface Electronic Warfare Improvement Program (SEWIP), a phased approach to upgrade the SLQ-32, the Navy's primary surface ship electronic warfare system.

The ALQ-99, initially fielded in the early 1970s with considerable success during the Vietnam War, has been progressively upgraded to the Improved Capabilities III (ICAP III) configuration currently installed on EA-18G Growler and 32 EA-6B Prowler electronic attack aircraft.

"We've really reached the end of our rope when it comes to the architecture of the ALQ-99," said Capt. John Green, the US Navy's program manager for airborne electronic attack and the EA-6B. "It's an outstanding system and continues to be effective, particularly in asymmetric warfare that we're seeing in Afghanistan and Iraq. But

when you look at some of the peer competitor warfare scenarios, it is losing its effectiveness. There are just limitations of the architecture itself where we need to move on to something that is a lot more capable."

"The [NGJ] will not just help us meet today's threats, but it will help us face tomorrow's threats," Filipowski said. "The [NGJ] is being designed as a flexible system that will give us the opportunities to operate in any environment that we would be tasked to operate in, from fighting pirates potentially all the way on through a major contingency operation."

The ALQ-218 receiver, which intercepts the radar signals for the ALQ-99 to jam, "is really state of the art," Green said. "But we've got to pair it up with a [new] tactical jamming system in order for it to be capable against the evolving threats."

In November, the US Navy decided to integrate the NGJ onto the EA-18G aircraft first, anticipating that the jammer will be an externally mounted podded system, Green said. The NGJ later will be integrated in the US Marine Corps' F-35B Lightning II strike fighter as an external pod system, at least initially, in order to field the capability sooner than would be the case with an internally mounted system.

"Doing things conformal or anything that's internal drives a lot of

The current mainstay of the USN's airborne EW capability is the EA-6B Prowler, seen here being launched from the deck of an aircraft carrier. This Prowler is carrying three long range fuel tanks and two ALQ-99 EW pods. (USN)



costs, especially for a jammer, where you've got to have a significant field of view for it to do its job," Green said, adding that the NGJ is being considered for the A and C versions of the F-35 as well.

The NGJ is not yet officially a program of record, Green said, but is being treated like one.

"We try to gather a lot of data and developmental experience of a system before we actually call it a program of record," he said, noting that the effort likely will make the transition to one in early 2015.

US Defense Secretary Robert M. Gates, speaking to reporters on Jan. 6, said the Department of Defense plans to reinvest funds saved from reducing overhead costs on developing next-generation electronic warfare capabilities.

The USN allocated a total of US\$24 million to four industry teams — BAE Systems, ITT/Boeing, Northrop Grumman and Raytheon — two years ago to study options for an NGJ. A subsequent open-competition technology maturation phase followed, with US\$168 million split among the same four teams for further development.

One of the challenges of developing electronic warfare systems is the lack of a commercial market for such systems to leverage for military development.

"It takes a grassroots effort to mature technologies that don't find a lot of other uses," Green said.

The USN is looking to increase its jamming power with the NGJ.

"Power is life when you're a jammer and, particularly, a standoff jammer like this that doesn't go deep in the threat envelopes," Green said. "Staying outside the standoff distance demands more power. We also want to do some smart things with the jammer that we're not able to do with the ALQ-99 because of some architecture constraints, like being able to jam coherent radars [and] being able to adjust polarization more responsively."

Green explained that "coherent radars are radars that have a very specific pulse train. If we can use a very similar pulse train, then we have a much more effective jamming response than we would otherwise get."

Regarding polarization, Green said the jammer needs to match up with the actual

wave-form of the radar, noting that "if we don't match up with that well, then our jamming, in some cases, could be 100 percent out of sync."

Northrop Grumman built the EA-6B and integrated the ALQ-99 system in the EA-18G, the first platform for the future NGJ.

"Integration with the aircraft is a complex process that ensures we are balancing both the jammer performance and the aircraft performance to maximize their mutual benefit," said Tom Stavropoulos, manager of the NGJ campaign for Northrop Grumman's Aerospace Systems Division in the US.

Key among the needs for the NGJ are number of simultaneous jam beams, higher effective radiated power, field of view, advanced modulations and polarization control within the size, weight and power constraints, he said, noting that the technologies required to provide those capabilities included "advanced power generation, apertures, beam formers, exciters and amplifiers."

"Each of these requirements drives specific solutions that have significant impacts on component selection, packaging into the jammer pods and the integration of those pods with the various aircraft types to create effective airborne electronic attack (AEA) systems," Stavropoulos said.

He said that, unlike the EA-18G, the F-35B, with only a pilot, will operate without an onboard electronic countermeasures operator.

Stavropoulos said his team "will incorporate additional technology

A USN EF-18F Growler EW aircraft. The Growler is already starting to replace the EA-6B in the fleet however, it is suffering from having to use the older ALQ-99EW pod technology. (USN)



The venerable ALQ-99 EW pod. Soon to be replaced. (USN)

solutions that will accommodate more automation or off-board control of the information necessary to mission tasking."

The Navy is requiring a modular, open-system approach (MOSA) for the NGJ, and Stavropoulos stressed that in order to maintain MOSA flexibility in the future, "keen engineering discipline and keen insight into the types of technologies needed" will be needed during the life cycle of the NGJ.

"MOSA, combined with components that are software reprogrammable and multifunctional, will allow NGJ to be very responsive to a wide range of mission requirements," he said. "Second, it will minimize the need for hardware changes to meet the future threats,

and, finally, it will give the Navy the flexibility to readily accept upgrades and modifications to meet future challenges.

"As the Navy continues to refine the AEA requirements for NGJ and identify opportunities for both manned and unmanned aircraft as part of the system, the concept of scalability will be crucial," Stravopoulos said. "Scalability will allow the NGJ approach to be tailored for integration into many systems beyond aircraft, such as into both ground and ship platforms. This concept of multiple platforms operating in a common architecture across the domains of air, land and sea has the potential to revolutionise how we think of electronic attack.

"The NGJ is expected to fill the same role as the current ITT/EDO-designed ALQ-99 pod, but with vastly improved capability, such as increased radiated power, new modern jamming modulations and the ability to target multiple, geographically separated threats simultaneously," said Bob Ferrante, vice president and general manager of ITT Electronic Systems' Airborne Electronic Attack business area. "It is a challenge packaging all this additional capability inside a family of fewer distinct pod types. While the complete ALQ-99 consisted of a family of 10 different pod types, the NGJ will be housed in as few as three pod types.

"For the NGJ to effectively jam enemy airspace, it requires a large amount of independently generated prime power," Ferrante said. "This power cannot be siphoned from the Growler. Therefore, creating sufficient power with a ram-air turbine or other power source is a serious technical challenge.

"Broadband electronically steerable arrays will allow the NGJ to target multiple threats simultaneously and allow for a near instantaneous movement of transmit beams. Our solution, which has the advantage of being based on prior technology development performed on behalf of the [Air Force's] B-52 support jamming program, provides industry-leading capability in antenna performance."

ITT's partner, Boeing, brings to the competition "its knowledge of its EA-18G aircraft and its expertise in pod design and large-scale

aircraft systems integration to the EA-18G," Ferrante said.

In mid-2012, the USN expects to select two of the teams to "take the technologies to the next level and design a whole system and prototype it," Green said.

The teams will conduct a flight and capability demonstration of their systems on an aircraft of their choice. The prototype phase is expected to run approximately 27 months.

Green said the initial operational capability of the NGJ is planned for 2019.

"We're trying to balance the fact that we want something out there as soon as possible, but it's got to be a game-changing-type [of] transformational capability," he said.

"In its lifespan, the ALQ-99 has already survived one platform," from the EA-6B to the EA-18G, Filipowski said. "I would anticipate that the [NGJ] also will, similarly, probably outpace the lifespan of some of the aircraft that it would be integrated with in the long run."

Integration is one of the main challenges for fielding electronic warfare capabilities in the fleet, and that is not limited to the challenge of integrating a system on two or more different platforms.

"One of the paradigms that we continue to look at and show a lot of interest in is electronic warfare battle management," Green said. "We're realising that we've got to better integrate all of the systems that we use. We have to really line up the receiver with the jammer and make sure that they work well together.

"The same thing goes on in the communications world," he said. "There are a lot of systems that communicate on the adversary side and we've got to be able to manage and control that spectrum at the time and place of our choosing so that we have an effective way to assess and deal with those threats.

"With this electronic battle management paradigm, we're looking to go outside of the platform and integrate across a range of systems to make sure that they're all working in contour with one another," Green said.

"What this is really about is capabilities that enable us to fight and win in the electromagnetic spectrum," Filipowski said.

USN SURFACE SHIP EW UPGRADES

As part of its renewed focus on electronic warfare capabilities, the US Navy is planning further upgrades in its primary surface ship electronic surveillance and jamming systems, the SLQ-32.

As the US Navy prepares for the introduction of Block 2 of its Surface Electronic Warfare Improvement Program (SEWIP), a phased approach to upgrade the SLQ-32 the Navy is developing the concepts for Blocks 3 and 4 of the SEWIP upgrades.

"The Navy has had a resurgence in the [electronic warfare] mission area, specifically," said Rear Adm. Sean R. Filipowski. "We've begun to

ALQ-218(V)2 Receiver System

- Latest technology wide-band receiver provides accurate emitter identification and location
- Selective reactive jamming capability for greater effectiveness

ALQ-99 Tactical Jamming Pods

- Proven system is already in U.S. Navy inventory
- Ongoing transmitter upgrade program substantially improves effectiveness against 21st century threats

Communication Countermeasures Set (CCS)

- Smaller and more capable than USQ-113 with expandable infrastructure

Approved for Public Release SPR 101.3

CC30406020 ppt

A cutaway of the Growler aircraft showing key systems. (Boeing)



Mounted below the Bridge wing of this Arleigh Burke class destroyer is the SLQ-32 ESM sensor. This unit is fitted to nearly all USN warships and is the only sensor for EW purposes. (USN)

recapitalise our capabilities fleet-wide. Technology today is exploding all around us and there are huge leaps in technological capabilities that could be turned into weapons systems.

"SLQ-32 has been around a long time and it served us well," Filipowski said. "Much like the ALQ-99 [jamming system on the EA-6B aircraft], it's reached a tipping point where our ability to upgrade it has been surpassed by technology leaps as well as potential threats. The transition to the [SEWIP] — a block approach designed to take advantage of rapid technology increases in our capability — has proven to be very effective."

The original SLQ-32, designed by Raytheon Co., was introduced in the 1980s as a warning system primarily against incoming anti-ship cruise missiles. Some versions also have a jamming capability. With advances in technology, the original system faced obsolescence in some of its components as well greater sophistication in the threats it was meant to counter.

In 1996, the Advanced Integrated Electronic Warfare System program was begun to replace the SLQ-32, but was cancelled in 2002 because of delays and cost. The SEWIP program was created to introduce a series of upgrades to the SLQ-32. General Dynamics was selected as the contractor for SEWIP Block 1, which was introduced in phases.

Block 1A dealt with obsolescence issues, particularly since some processors were no longer in production. Block 1B1 involved upgrades to meet evolving threats. Block 1B2 added a Specific Emitter Identification (SEI) capability, enabling the operator to identify

the type of threat.

Blocks 1A, 1B1 and 1B2 reached full-rate production and are being fielded, according to Cmdr. Theodore Zobel, the principal assistant program manager for electronic warfare for the program executive officer for integrated warfare systems, in a written response to questions. As of early March, approximately 65 Block 1A, 40 Block 1B1 and 10 Block 1B2 systems had been fielded.

Block 1B3, for which Lockheed Martin is a major subcontractor, adds High Gain/High Sensitivity to the SLQ-32 and is in contractor testing. It entered low-rate initial production in October.

SEWIP Block 2, for which Lockheed Martin is prime contractor, represents "a technological leap forward, and positions the USN to continue to stay ahead of the threats as they're coming down the pike," said Joe Ottaviano, SEWIP program director for Lockheed Martin Mission Systems and Sensors in Syracuse, N.Y.

Block 2 — for which many details are classified — includes a new antenna and receiver group. It takes the SLQ-32 to the next level, Ottaviano said.

"The SEWIP sensor, itself, is the first sensor to be built around the USN's new product line architecture, which really puts all the data available to anybody on the ship who wants to use it. As the combat systems upgrades happen, they'll be able to take advantage of this new data. They will be integrated and the integration will continue to improve," he said.

Block 2 will integrate the SLQ-32 with the Aegis Combat System and

the Ship Self-Defence System in the USN's warships.

The USN conducted a critical design review for SEWIP 2 on Feb. 24.

Lockheed Martin will build two engineering and manufacturing development models for the Navy in fall 2012. The Navy will test them at its Wallops Island facility in Virginia.

The ship selected to test the Block 2 will be an Arleigh Burke-class guided-missile destroyer, Ottaviano said.

Low-rate initial production is scheduled to begin in late 2012 or early 2013, with delivery of the first three production units in 2014. These three units are scheduled for installation on the first two Zumwalt-class guided-missile destroyers and the aircraft carrier GERALD R. FORD.

The initial operational capability date of Block 2 is classified, Zobel said, but noted that "system installations are planned for 2013/2014."

Block 2 will be installed on the USN's older warships as they go through upkeep periods.

Lockheed was awarded a US\$9.9 million contract in 2009 for the design phase of the SEWIP Block 2 program. Following a preliminary design review last June, the company was awarded a US\$51.2 million development contract through the critical design review and the production of two engineering models. Combined with production options, the total since the preliminary design review may reach US\$167 million.

US Defense Secretary Robert M. Gates, speaking to reporters on Jan. 6, announced the department's plans to re-invest funds saved from reducing overhead costs toward developing next-generation electronic warfare capabilities. When he rolled out the department's 2012 budget request on Feb. 14, he allocated \$158 million for SEWIP, an increase of \$79 million over the 2011 request.

The Lockheed Martin SEWIP Block 2 team includes Cobham Sensor Systems, Lansdale, Pa.; Mercury Computers, Chelmsford, Mass.; and Linear Photonics, Hamilton, N.J.

As Block 2 — which is a passive sensor upgrade — matures, the Navy is planning for the next two SEWIP upgrades to the SLQ-32.

"SEWIP Block 3 is envisioned to provide electronic attack [jamming] upgrades to SLQ-32 systems, with development beginning in approximately 2012," Zobel said. "SEWIP Block 4 is a placeholder for additional SLQ-32 upgrades, for example in [electro-optical/infrared (EO/IR)]."

"Block 4 [involves] electro-optical/infrared distractions, a countermeasures approach," Ottaviano said. "There are EO/IR countermeasures out there, but this one will take it to the next level in distraction and deception type capabilities."

One of the goals of Block 4 will be to defeat missiles with tri-mode seeker heads, which can switch back and forth between modes — electro-optical, infrared and millimetre microwave — to avoid jamming and lock on the targeted ship.

"This is about fighting and winning the electromagnetic spectrum, ultimately," Filipowski said. "We want to have systems that are upgradeable from a technology perspective — tech refresh — and capabilities that allow us to provide for tech insertion should an urgent capability be needed, something that we can do very quickly, not just gradually over time. We have to have the ability to change our capabilities on the fly to meet the mission demands that are placed upon us.

"Integration is certainly a very big obstacle we have to overcome as we integrate new technology with older technology and ensure that it's compliant and can be worked in both worlds," he said. "Even beyond that, the growth, the explosion of the technology has meant that we are quickly outpacing ourselves with technology at a very iterative rate."

"The tough part will be keeping up the technology explosion, because as technology continues to mature and advance, potential threats will similarly advance in all the same ways. For us to be able to pace that, keeping up with the technology is going to be essential to our overall success.

"We need to be able to operate at a time and place of our choosing, but not necessarily under the circumstances of our choosing," Filipowski said. "If we have ships or airplanes that have to be able to move very quickly from one theatre to the next, we also need to be able to change the parameters by which they operate on the fly so they could be just as successful in one environment, in one theatre, as they were in the other." ■

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A Ticonderoga class cruiser (closest to camera) and an Arleigh Burke class destroyer at sea. Both ships, like most in the USN, are fitted with two SLQ-32 systems on either beam. The USN will be replacing its current SLQ-32 ESM systems with a newer Block 2 variant shortly to maintain an edge in the EW battlespace. (USN)





01 MCG FOR FFGs

In the waters off Hawaii HMAS SYDNEY proved the performance of a missile fire-control upgrade enabling exploitation of the Standard Missile-2 (SM-2) mid-course guidance (MCG) mode.

Successful at-sea tests were performed during 13-20 June at the USN's Pacific Missile Range Facility (PRMF). The live firings served as a combined development and operational test of the FFG's ability to employ the SM-2 in MCG mode.

Under Project SEA 1390 Phase 4B, the RAN's four remaining FFGs have received the SM-2 Block IIIA missile as a replacement for the previous-generation SM-1 Block VI. As well as resolving life of type issues associated with SM-1, the introduction of the SM-2 brings a significant improvement in range and performance.

During the much criticised project the FFG combat system has received a number of modifications to enable the SM-2 capability. These include: changes to the Mk-13 Guided Missile Launching System; installation of an inertial navigation system for improved attitude data including digital distribution; modifications to the Mk-92 Mod 12 continuous-wave illumination transmitters to support missile uplink modulations; an updated weapon control system through adaptations to the Mk-92 Mod 12 weapon control processor software and the introduction of a Standard Missile Adjunct Processor (SMAP); and modifications to the onboard training system.

In MCG mode the FFG can launch an SM-2 to fly out 'silently' without the ship having to provide constant illumination support to the missile

during its trajectory to the point of intercept. Compared with home all the way, this guidance mode enables engagements at far greater range, significantly expands the defended footprint and ensures that the target is unaware of the closing missile until it's too late.

ASMD UPGRADE SUCCESS

The RAN's new ASMD (Anti-Ship Missile Defence) radar system has been released for initial operational use after achieving outstanding results from the trial of the system off the coast of Australia and Hawaii.

The new multi-phased array radar system has been installed on the Anzac-class frigate HMAS PERTH. The radar identifies, tracks and guides missiles to multiple targets at the same time.

At the moment the Anzac frigates can track and destroy one target at a time. The new radar means they will now be able to track and destroy up to 17 targets simultaneously.

The radars that allow for this are developed in Australia by CEA Technologies in the ACT.

Chief of Navy Vice Admiral Ray Griggs said HMAS PERTH tested the system on the United States Navy Pacific Missile Range Facility in Hawaii with tremendous results.

"The tests proved that the new system can defend the ship from modern cruise missile attack. This is a significant enhancement for the Anzac-class frigates."

HMAS PERTH is the lead ship in this project. Following the successful testing of the system on this ship, the Government will soon make a decision about upgrading the other seven Anzac-class frigates.

02 SEA KINGS FOR SALE

Minister for Defence Materiel Jason Clare has released the Request for Tender for the sale of the Navy's remaining Sea King Helicopters.

The Request for Tender includes:

- Five complete helicopters;
- Three airframes;
- A simulator; and
- Associated unique equipment and parts.

"The Sea Kings will be withdrawn from service in December 2011," Mr Clare said.

"They've been the workhorse of the Navy, having flown in excess of 60,000 hours in operations in Australia and overseas.

"The latest example of their work was the disaster relief and search and rescue missions they conducted during the Queensland floods."

Mr Clare announced on 7 June 2011 that Sea King Shark 07 would be preserved at the Fleet Air Arm Museum in Nowra with the remaining aircraft to be offered for sale by tender.

RFT documentation is available for download after registering on the AUSTENDER website www.tenders.gov.au.

03 FIRST KEEL BLOCK DELIVERED FOR AWD

On 18 August the first keel block that will be used to construct HMAS HOBART – Australia's first Air Warfare Destroyer - arrived at the ASC Shipyard in Adelaide .

Construction of the AWDs involves 90 separate steel blocks being built at shipyards in Adelaide (ASC), Melbourne (BAE Systems), Newcastle

01

HMAS SYDNEY in waters off Hawaii firing a Standard Missile-2 (SM-2). Successful at-sea tests were performed during 13-20 June at the USN's Pacific Missile Range Facility to confirm the mid course guidance capability which will allow the class to fully exploit the SM-2's range. (RAN)





(Forgacs) and Ferrol, Spain (Navantia).

Three sonar blocks are being constructed in Spain and the United Kingdom.

Approximately 70 blocks will be shipped to Adelaide over the next four years where they will be consolidated into three new warships.

Over the next six months it is expected that six blocks will be delivered from Melbourne and Newcastle to Adelaide.

The first block delivered weighs around 180 tonnes. It is 18 metres long, 16 metres wide and five metres high and will form part of the keel of HMAS HOBART.

It was loaded on to a barge at BAE System's Melbourne shipyard on 11 August.

The barge was towed by tug boat to the Common User Facility in Adelaide arriving on 15 August.

Further work on the block including blast and paint, fitting pipes, installing communications and electrical cables and fitting internal walls will now be completed.

Two other hull blocks are currently being prepared for shipment from Melbourne to Adelaide.

Construction has begun on all main blocks for the first ship and work has also begun on blocks for the second ship, HMAS BRISBANE.

Next year work will begin on blocks for the third ship, HMAS SYDNEY, and the first ship will start to be consolidated in Adelaide.

DECOMMISSIONING OF HMAS KANIMBLA

On 18 August the Minister for Defence, Stephen Smith, and Minister for Defence Materiel, Jason Clare, announced that the remaining LPA HMAS

KANIMBLA would be decommissioned.

In September 2010 the then Chief of Navy imposed an operational pause on HMAS Ships KANIMBLA and MANOORA due to seaworthiness concerns. Since then, Defence has assessed the future of HMAS KANIMBLA.

This included a detailed assessment of the capability provided by KANIMBLA, an assessment of its materiel state and a cost and risk assessment.

The outcome of this assessment is that the most cost effective and lowest risk option is to decommission HMAS KANIMBLA.

The cost to complete the extensive remediation work required on HMAS KANIMBLA is estimated to be up to \$35 million.

HMAS KANIMBLA would not on that basis be available for operations until at least mid-2012. HMAS KANIMBLA was scheduled in any event to be decommissioned at the end of 2014.

The Minister said that "it does not represent value for money to therefore pursue further maintenance on HMAS KANIMBLA."

Accordingly, on the basis of advice and recommendations from the Chief of Navy and the Chief Executive Officer of the Defence Materiel Organisation, the Government agreed to decommission HMAS KANIMBLA.

CHIEF OF NAVY CONGRATULATES GROUP BRAVERY CITATION RECIPIENTS

The Chief of Navy has congratulated 18 Australian Defence Force personnel who were recognised by the Governor General for their involvement in the Suspected Irregular Entry Vessel (SIEV) 36 tragedy in 2009.

Included in this group were 15 Navy people who

were awarded a Group Bravery Citation for their involvement in rescuing passengers and Navy crews after SIEV 36 exploded near Ashmore Reef off Western Australia on 16 April 2009.

One of these personnel, Leading Seaman Matthew Keogh, also received the Bravery Medal for his contribution.

Chief of Navy Vice Admiral Ray Griggs praised the efforts of all personnel onboard the Armidale class Patrols Boats CHILDERS and ALBANY as well as those at Northern Command Headquarters in Darwin for their efforts on the tragic day.

"This is well-deserved recognition for all the Navy people who worked hard to save lives on that tragic day," VADM Griggs said.

"We should all be proud of their efforts and, on behalf of the Royal Australian Navy, I congratulate them for their work both on this day and throughout their careers.

"Both CHILDERS and ALBANY continually manoeuvred with their rigid-hulled inflatable boats to rescue as many people as possible. Ultimately, all nine Defence Force personnel onboard the SIEV at the time, and 44 passengers and crew of the vessel were recovered. Sadly, five people died and a number sustained serious injuries.

"This award is also recognition for all the men and women who put themselves on the line when they pull on the uniform and undertake Operation RESOLUTE in northern Australian waters. It is a task that is undertaken every single day, and one that requires great persistence, dedication and professionalism," VADM Griggs said.

02

Sea King Shark 07. This Sea King will be preserved at the Fleet Air Arm Museum in Nowra while the remaining aircraft are being offered for sale by tender. (RAN)



03

The first keel block for construction of HMAS HOBART – Australia's first Air Warfare Destroyer – arriving at the ASC Shipyard in Adelaide. (RAN)



The citation praises the entire group for reacting "swiftly and professionally" when rescuing people in the water and onboard the burning vessel.

04 SHI-LANG TO FALL UNDER CENTRAL COMMAND

China's refurbished Soviet-era aircraft carrier, the ex- VARYAG, which embarked on its first sea trials on 10 August, will fall under direct command of the Central Military Commission (CMC) and will be officially delivered to the People's Liberation Army Navy (PLAN) on 1 August 2012, Chinese media have reported.

The 60,000-ton Kuznetsov-class carrier, which concluded up a four-day sea trial on 14 August, will officially enter service in the South China Sea on the anniversary of the founding of the People's Republic of China.

A report, carried in the official People's Daily newspaper stated that the ex- VARYAG would be under the direct command of the CMC rather than the PLAN. The CMC ordinarily only assumes direct command of the armed services in wartime, with the services ensuring command in peacetime. This chain of command would show the strategic value placed on the aircraft carrier; the only other forces under CMC command in peacetime are China's strategic nuclear forces.

The ex- VARYAG was a short take-off but arrested recovery (STOBAR) carrier originally ordered for the Soviet Navy but never completed. Construction work at the Chernomorsky shipyard in Nikolayev, Ukraine, stopped in 1992 with the vessel just 70 per cent complete.

In 1998 the hulk was sold to Chong Lot, a

previously unknown company based in Macau, ostensibly for conversion to a floating casino. The vessel was towed from Nikolayev in June 2000 bound for China but its passage was delayed for 16 months as a result of wrangles with Turkey over its transit through the Bosphorus and Dardanelles straits. The ship eventually arrived in Dalian in March 2002.

Major refurbishment work commenced in Dalian in 2005. Western analysts have long suspected that the ship was being completed for the People's Liberation Army (Navy) - PLA(N) - as a STOBAR-configured aviation training platform from which to develop skills in carrier operations. This was confirmed by China's defence ministry in July 2011, which said the ex- VARYAG will be used as a "scientific research, experiment and training vessel".

EIGHT NEW CUSTOMS BOATS

At a ceremony held on board Austal's next generation 102 metre trimaran on 12 August 2011, Austal was awarded a contract for the design, construction and through-life support of eight new patrol boats for the Australian Customs and Border Protection Service. This contract is Austal's second contract with the Australian Customs and Border Protection Service, having designed and constructed Customs' current fleet of eight Bay class vessels, which have been in operation for over 10 years.

Austal will build the fleet of Cape class Patrol Boats at its shipyard in Henderson, Western Australia. Construction of the first vessel is expected to commence in February 2012, with all eight due to be delivered between March 2013 and August 2015.

The 57.8m Cape class Patrol Boats have been

designed to have greater range, endurance and flexibility, as well as enhanced capability to operate in more severe sea conditions than the current Customs' fleet.

The In-Service Support contract extends for a minimum period of eight years and encompasses a full range of intermediate and depot level maintenance activities. Further options can be exercised by the Australian Customs and Border Protection Service for In-Service Support for the life of the Cape Class Patrol Boat Fleet.

05 JSOW C-1 MAKES FIRST LIVE DROP

The USN announced on 29 July that it had successfully completed the first free-flight test of the C-1-variant of the AGM-154 Joint Standoff Weapon (JSOW).

The flight, which took place at the Point Mugu sea range off California on 26 July, saw the weapon dropped from a Boeing F/A-18F Super Hornet.

According to Naval Air Systems Command (NAVAIR), the purpose of the trial was to verify the weapon's characteristics. The drop was the first end-to-end functionality test of an inert JSOW C-1, from pre-flight to target impact.

The successful conclusion of the trial saw the GPS/inertial navigation system (INS)-guided glide-bomb strike an unmanned 260-ft long Mobile Ship Target in the Pacific Ocean. During the terminal phase of its attack, the weapon switched from GPS/INS guidance to its infrared seeker.

Equipped with the Link 16 datalink, the JSOW C-1 will be the first network-enabled weapon in the US military's inventory and the first weapon

04 China's refurbished Soviet-era aircraft carrier SHI-LANG (ex- Soviet VARYAG) ready for sea. The 60,000-ton Kuznetsov-class carrier, which was to be a floating casino, concluded a four-day sea trial on 14 August.

05 The first free-flight test of the AGM-154 Joint Standoff Weapon C-1-variant of the (JSOW) dropped from a Boeing F/A-18F Super Hornet against an unmanned 260-ft long Mobile Ship Target in the Pacific Ocean. (USN)





with the capability to precisely strike moving maritime targets.

There are four variants of the weapon: JSOW-A, JSOW-A1, JSOW-C and JSOW-C1. About 3,500 JSOWs have been delivered to the USN, with some for the RAAF's Super Hornets, since 1998, with more than 400 used in combat. The JSOW C-1 will be integrated on Boeing F/A-18E/F Super Hornets and on the Lockheed Martin F-35 Lightning II Joint Strike Fighter.

CHINA OFFICIALLY LAUNCHES SECOND TYPE 071 LPD

Chinese media have reported The People's Liberation Army Navy (PLAN) has officially launched its second Yuzhao-class Type 071 landing platform dock (LPD) in Shanghai, named JINGGANGSHAN.

JINGGANGSHAN has a length of 210m and a width of 28m, the 19,000-tonne can accommodate helicopters, armoured fighting vehicles, boats, landing craft and about 1,000 soldiers.

The other Type 071, the 18,000-tonne KUNLUNSHAN, was launched in December 2006 and entered service in November 2007. Reports earlier this year said a third Type 071 is being built.

JINGGANGSHAN is thought to be equipped with one 363S E/F-band 2D air/surface search radar and one 364-type (SR-64) X-band 2D air/sea search radar and is also armed with one PJ-26 6mm cannon and four AK-630 30mm cannon.

AUSTAL AWARDED CONSTRUCTION CONTRACT FOR JHSV 6 AND 7

The U.S. Navy has exercised contract options

funding the construction of the sixth and seventh Joint High Speed Vessel (JHSV) catamarans, as part of a ten-vessel programme potentially worth over US\$1.6 billion. The construction contract for both vessels is valued at approximately US\$313 million.

Austal Chief Executive Officer, Andrew Bellamy, noted that this contract demonstrates the USN's confidence in Austal as a leading defence prime contractor.

"With options remaining for a further three vessels, the JHSV program is expected to deliver a predictable revenue stream of AUD\$330 million per annum from 2012 to 2015, which is approximately 60 per cent of Austal's historical revenue."

As prime contractor, Austal was awarded the construction contract for the first 103-metre JHSV in November 2008, with options for nine additional vessels between FY09 and FY13. The Austal JHSV team includes platform systems engineering agent General Dynamics Advanced Information Systems who is responsible for the design, integration and testing of the ship's mission systems, including internal and external communications, electronic navigation, and aviation and armament systems.

Austal received authorisation from the USN to start construction on the first vessel of the contract, SPEARHEAD (JHSV 1), in December 2009 after completing the rigorous design over a 12-month period. SPEARHEAD was launched in August and will be delivered in December 2011. Construction on VIGILANT (JHSV 2) began at Austal's Mobile, Alabama, USA shipyard on September 13, 2010.

06 ILLUSTRIOUS RETURNS TO SERVICE

After £40m worth of work carried out over a 16 month period, 'Lusty' has set off down the long road to front-line service which will take her to the end of her life in 2014.

Since arriving on the Forth at the beginning of last year, ILLUSTRIOUS has seen her communications kit enhanced, mess areas – the crew's living spaces – revamped, a new anti-torpedo system fitted, and has had 540,000 litres of paint (enough to fill one fifth of an Olympic-sized swimming pool) applied, including a fuel-efficient coating to her outer hull which will make her scythe through the oceans more efficiently, among other work carried out by Babcock and the ship's company.

Above all, however, the ship emerges from refit capable of carrying up to 20 helicopters and 600 troops as an assault ship (a function she performed for real during operations in Afghanistan in 2001-02).

She'll serve as the nation's on-call helicopter carrier when HMS OCEAN goes into refit,

INGALLS SHIPBUILDING AWARDED CONSTRUCTION CONTRACT FOR DDG 113

US Company Ingalls Shipbuilding, has been awarded a construction contract for the Arleigh Burke-class (DDG 51) destroyer DDG 113.

DDG 113 will be the 29th Arleigh Burke-class destroyer built by Ingalls out of 62 ships in the class.

Ingalls Shipbuilding has delivered 28 Arleigh Burke-class ships to the USN. The company's 28th ship, WILLIAM P. LAWRENCE (DDG 110), was commissioned in Mobile, Ala., on June 4.

06 ILLUSTRIOUS arriving back at Portsmouth after a £40m refit to turn her into an assault carrier. (RN)

07 Cunard's Queen Mary 2 (QM2) arriving in Sydney Harbour and berthing alongside Fleet Base East with the bow of HMAS TOBRUK in the foreground. The QM2 has a Gross Tonnage of 151,400 and can carry 2,620 passengers and with a length of 1,132 feet and a draft of 32 feet the only place she can berth is alongside at Garden Island. (RAN)



"The opportunity to build DDG-113 and the USN's plan to restart the DDG-51 class production line aligns with our business strategy of building classes of ships in serial production," said Bob Merchant, vice president, surface combatants and U.S. Coast Guard programs, Ingalls Shipbuilding. "We've built a strong DDG team, and we're focused on building these ships more efficiently. Focusing on better processes and improved performance ensures our future and gets the Navy more ships."

07 CRUISE SHIP DOCKING AT GARDEN ISLAND, SYDNEY

Minister for Defence, The Hon. Mr Stephen Smith, has recently announced an independent review of the future use of the naval docks at Garden Island in Sydney by visiting cruise ships. A recent NSW Government report has highlighted the increase in cruise ships visiting Sydney.

The report also identifies future requirements for berth space for large cruise ships east of the Harbour Bridge.

The independent review will assess whether there is scope to enhance cruise ship access to Garden Island without adversely impacting on its priority role of supporting Navy maritime operations.

The review will focus on be opportunities for greater civil-military cooperation in the use of finite berthing resources for very large vessels in Sydney.

The review will also take into account the increase in use of Garden Island by new, larger Royal Australian Navy ships including the two Canberra class multi-purpose LHDs, the new

Landing Ship Dock vessel HMAS CHOULES, and three Hobart Class Air Warfare Destroyers.

These ships will require suitable berthing facilities and will draw on Sydney's strong industry support base for maintenance and repairs.

The independent review will assess whether there is scope for a more flexible approach that balances Navy's needs with cruise industry requirements to secure advanced berth bookings for cruise ships visiting Sydney Harbour.

The review will be undertaken by former Defence Secretary Dr Allan Hawke AC, who has recently completed a review of the future management and use of the Woomera Protected area.

08 SINGAPORE RECEIVES FIRST ARCHER-CLASS SUBMARINES

The Republic of Singapore Navy (RSN) has taken delivery of the first of two ex-Royal Swedish Navy (RSwN) Archer-class (A-17) diesel electric submarines modernised in Sweden by Kockums.

After a long voyage from Europe on a sea lift ship, RSS ARCHER (ex-HMS HÅLSINGLAND) - equipped with an air-independent propulsion (AIP) system - entered Changi Naval Base on 17 August prior to joining the RSN's 171 Squadron.

ARCHER is expected to be joined by sister boat RSS SWORDSMAN (ex-HMS VÄSTERGÖTLAND) in 2012. SWORDSMAN was relaunched in Karlskrona, Sweden, in October 2010 and is undergoing sea trials; ARCHER was relaunched in June 2009 and commenced sea trials at the end of that year.

The RSN purchased the older submarines in 2005 and while no details of the contract

were made public, Swedish media outlets have previously reported the deal to be worth about US\$127 million.

The two boats that remained in Swedish service, now known as the Södermanland class, began mid-life refits in 2000 that saw the installation of a Stirling Mk-3 AIP system in a 12m plug in the pressure hull, a diver's lock-out chamber to facilitate special operations and a new climate control system. ARCHER and SWORDSMAN have completed a similar modernisation package.

In addition, the RSN units have received combat data systems developed by Singapore's Defence Science and Technology Agency (DSTA) and ST Electronics. The DSTA has also supplied weapon-control and tactical data modules from its SUBTICS combat system line.

The refitted submarines are 60.5m long and have a crew of 27. Since 2007 RSN submariners have undergone extensive training in Sweden in the RSwN's upgraded Södermanland class boats. ■

08 RSS ARCHER seen here during her relaunch in June 2009.



STRONGER SHIPPING FOR A STRONGER AUSTRALIA

The Hon. Anthony Albanese MP
Federal Minister for Infrastructure and Transport

For many years the Navy League of Australia has been concerned about the state of Australia's Merchant Shipping capability. On 9 September the Minister responsible for Australian shipping announced a number of reforms.

The Government believes there are sound economic, environmental and security reasons to revitalise the Australian shipping industry.

Australia is currently experiencing a once in a generation resources boom and the Nation's prosperity is linked to the world needing and wanting our resources. Ninety-nine per cent of Australia's international trade is carried by ships, yet only one half of one per cent of that trade is carried by Australian flagged vessels.

Our ports manage ten per cent of the world's entire sea trade. \$200 billion worth of cargo is moved annually.

The industry employs more than 14,000 people either at sea or onshore. We are the biggest single island nation and the fourth largest shipping task in the world. Yet there are only 22 Australian registered major trading ships plying our waters today – down from 55 ships in 1995.

Of the remaining ships, only four — all gas tankers — are dedicated solely to international trade.

On top of this, a lack of investment means that our ships are getting older. The average age of the Australian fleet now sits at almost 20 years which is around eight years older than those in the world fleet.

Ironically, this imbalance exists despite Australia being a country that prides itself on the safety and environmental outcomes of shipping.

We know that the newer vessels are safer, more energy efficient and better meet the needs of modern shipping. But it is not just the age of the fleet that is holding us back. Like many industries, the maritime sector is also feeling the pressures of an ageing workforce with employers reporting that 49 per cent of their seafarer workforce is aged 45 years or older.

To compound the problem, attracting new recruits and building a strong and sustainable skills base has been hampered by the high cost and complexities of existing training structures. At the same time, participation in the domestic freight task is also at an all time low.

All this adds up to lost economic opportunities and environmental and security risks to the Nation.

The industry is at the tipping point. If we do not act now the Australian shipping industry will be lost forever.

This must change.

This Government is determined to remove the disincentives that have made it uneconomic to operate Australian ships in a global environment.

We are determined to create an environment that will encourage and sustain growth and productivity in our shipping industry.

Bass Trader. One of the 22 Australian flagged merchant ships still operating.



THE ROAD TO SHIPPING REFORM

Revitalising the shipping industry is a priority for the Government as national shipping creates jobs, is vital for our environment and essential to our security.

One of my first actions as a Minister was to commission a parliamentary inquiry into the coastal shipping sector and advise on ways of making it more competitive and sustainable.

The committee issued a unanimous report in October 2008, *Rebuilding Australia's Coastal Shipping Industry*.

In February 2009, I formed an advisory group of industry leaders to help us work out how to implement that report.

This was followed up during the 2010 election campaign with our shipping policy commitments.

On 1 December 2010, I released a Discussion Paper that proposed important reforms and invited submissions to be provided by the end of January 2011 (to which the Navy League of Australia made a submission).

In January this year I established three industry reference groups to consult and provide advice to the Government on the taxation, regulatory and workforce elements of the reforms. Members of those groups represent the breadth of the maritime industry: ports, the bluewater and offshore sectors, regulators, unions and training providers. We engaged across the Government, including Treasury and Finance officials.

The groups met numerous times, separately and together, and the discussions were conducted in a positive and constructive manner.

All that hard work and consultation has gone into producing the reform package, adopted by the Cabinet.

THE PACKAGE

A strong and competitive shipping industry is absolutely in our national interest. There are four elements to the reform package:

- Tax reform
- An Australian international shipping register
- A new licensing regime, and
- Workforce skills development.

TAXATION REFORM

We recognise that Australian shipping operators are competing against foreign operators that enjoy very competitive taxation, regulatory and employment arrangements.

Today, we are doing more than just catching up.

We will now be leading them.

The fiscal incentives developed with the Treasurer include:

- a zero tax rate;
- accelerated depreciation arrangements;
- roll-over relief for selected capital assets;
- tax exemptions for seafarers working overseas on qualifying vessels; and
- a Royalty Withholding Tax exemption where vessels are leased by an Australian company from foreign owners under a demise or bareboat charter.

A Zero Tax Rate

International experience in Europe, Asia and South America shows that the introduction of financial support — usually in the form of a tonnage tax and personal tax breaks for seafarers working in the international trade — has had substantial and very positive effects.

We have gone a step further — we are not introducing a new tax in the form of a tonnage tax and then setting a discounted rate.

We will *exempt* qualifying income from shipping from taxation.

We have done this to keep it simple.

Australian resident companies with vessels registered in Australia, including those on the International Register, *will not* pay company tax.

The definition of qualifying income will be liberal. But, of course, it must be income from seagoing commercial trading activities that carry cargo or passengers.

Accelerated Depreciation

I mentioned before Australia has an old fleet compared to international standards. This is in part due to our depreciation rate for vessels



The *Pacific Adventurer*. At 3.12 am (Queensland Time) on 11 March 2009, the 1990 built, 23,737 dwt ship lost 31 containers of ammonium nitrate overboard some seven nautical miles east of Cape Moreton while enroute to Brisbane from Newcastle. The ship reported later that it was holed on its port side near its engine room and a fuel service tank had been breached with the loss of some 270 tonnes of heavy fuel oil into the sea.

being set at 20 years.

We are cutting this in half and reducing this now to 10 years.

This reform has multiple effects.

An economic benefit - the cost of operating a 20 year old large bulk carrier is at least 40 percent more than for a five year old ship.

A safety and environmental benefit - newer vessels incorporate new technology making them safer and more environmentally friendly.

An employment benefit as ship building is encouraged.

Roll Over Relief

There will also be a roll over relief scheme so that shipowners can defer their tax liability arising from gain or profit on the sale of old vessels, when replacing them with new vessels.

Together with the accelerated depreciation provisions, this will encourage Australian shipowners to modernise their fleet.

Tax Exemption for Seafarers

It makes no sense that an Australian seafarer sitting on a ship in the Port of London should pay Australian income tax while an Australian working as a bartender in a pub in London does not.

Consequently, a refundable tax offset will be available to Australian employers of Australian resident seafarers engaged in international trades.

The offset will be equivalent to the amount of income tax withheld from pay and allowances of Australian resident seafarers who spend more than 90 days on international voyages on qualifying vessels in an income year.

Royalty Withholding Tax Exemption

The current arrangements work against the employment of Australian crew on vessels chartered by Australian companies.

For example, payments for a bareboat charter are subject to a royalty withholding tax but time charter payments are not.

By exempting the royalty withholding tax, we are removing the disincentive for the use of bareboat charters and promoting the use of Australian crew.

This will help make Australian-operated vessels cost competitive.

Conditions on Tax Benefits

We have placed a couple of conditions on receiving these tax benefits:

- Vessels entering the regime must be Australian flagged
- There will be a minimum training obligation, the details of which we will finalise with industry in the coming months
- Once a ship elects *into the exemption* they must remain in the regime for a minimum of 10 years.
- There will also be a lock out period of 10 years to reduce tax avoidance opportunities.

AUSTRALIAN INTERNATIONAL SHIPPING REGISTER

We recognise that international shipping is competitive, so the new tax package is designed not to just stop the decline in Australian shipping – it is designed to take advantage of the opportunities for Australia to be a major force in global shipping.

We need to grow our international fleet. This will be encouraged through the creation of an Australian International Shipping Register. This will help Australians to participate in international trade and address the cost disadvantages experienced by our registered vessels when competing internationally.

Vessels on the International Register will be Australian flagged. When they undertake an overseas voyage they must provide the crew with terms and conditions in line with the Maritime Labour Convention.

This is consistent with the practice of other major traditional maritime nations that offer international registers.

When Australian International Shipping Register vessels work domestic coastal routes, *all crew*, irrespective of nationality will be covered by the Fair Work Act.

The same environmental, safety and OH&S standards will apply to *these* vessels as apply to first register vessels.

To further support the industry, International Register vessels must employ a minimum of two Australian crew, preferably the Master and the Chief Engineer.

Another Australian flagged merchantman, the LNG carrier *Northwest Sanderling*.



In my view, these arrangements strike a good balance between competing on a level playing field internationally, while ensuring Australia's domestic maritime cluster can grow.

ACCESS TO THE COAST

Throughout this reform process there have at times been claims that the Government is planning to close the coast to foreign shipping. *This is not the case.*

It is important that Australian coastal shipping is competitive and that shippers can make use of foreign-registered vessels when Australian ships are not available.

But the current permit system is broken. It creates uncertainty and serves as a disincentive to capital investment. Permits are too easy to obtain. The alleged policy objectives are observed in the breach. It is not clear what permits are being issued and for what trade. The rules aren't clear and are not set out in legislation. There are no incentives to encourage a long-term commitment to working the Australian coast.

The new Reforms provide clarity and transparency to shippers and operators and enable them to plan long-term.

The new licensing regime will support Australian shipping and set clear boundaries around the necessary role of foreign vessels in our coastal trade. Licensing requirements and conditions will be set clearly in legislation, giving certainty and clarity to all operators.

There will be a three tier licensing regime.

A General Licence will provide Australian flagged vessels with unrestricted access to the coastal trades for a period of up to five years at a time. These vessels will also be eligible for the tax incentives.

A Temporary Licence will enable foreign-flagged vessels to operate the coastal trades, subject to time, trade and/or voyage conditions.

These licences will be available for a period of up to 12 months.

An Emergency Licence will be for cargo or passenger movements in emergency situations, such as natural disasters. These will only be valid for a single voyage.

Supporting this regime will be new reporting and publishing arrangements. And there will be a transitional period. Foreign-flagged vessels that are currently licensed will have five years to transition to Australian-flagged.

MARITIME WORKFORCE DEVELOPMENT FORUM

The fourth leg of reform is workforce development.

A ship is only as good as its crew. We must attract, train and retain a skilled seafaring workforce. There will be no incentive to invest without the right people in the right jobs.

I touched earlier on the challenges of an ageing workforce, costly and complicated training systems and the consequent erosion of skills. This was strongly identified during the Review of Coastal Shipping. The Australian Government took heed and in July 2009 we provided the Australian Maritime College in Launceston with almost \$4 million in funding for a new state-of-the-art maritime simulator to help deliver training in coastal navigation. This simulator is now something of an attraction and has already had visitors from Chinese, Japanese and American maritime educators.

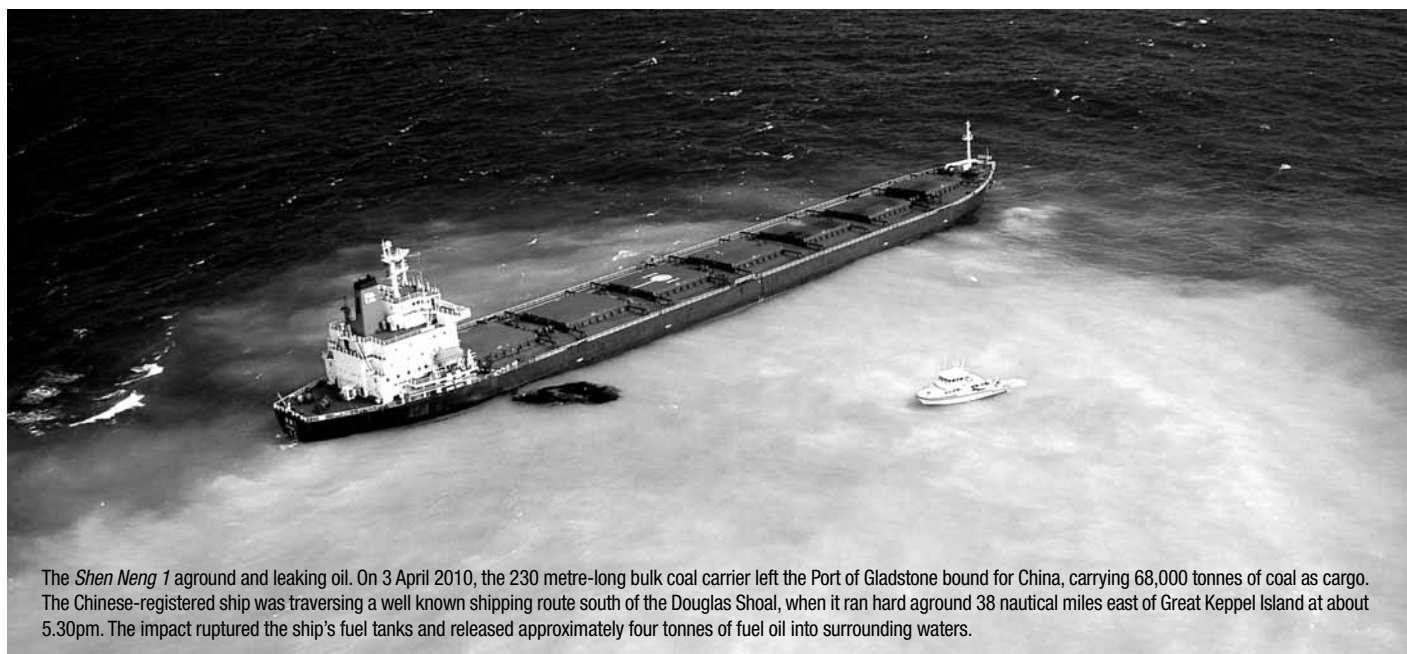
In February last year we provided the College with more than \$2 million to deliver vocational education and training. The Government has already been doing its bit in this area and I believe industry must also ramp up its efforts in resolving the skills lag.

To encourage this, I am setting up a Maritime Workforce Development Forum with experienced people from industry, unions and the training sector.

The Forum will address areas that are fundamental to building our skills base. These will include a workforce plan for the medium term to address issues including the ageing workforce and the most immediate skills gaps. I expect the Forum to work hand-in-hand with the proposed National Workforce and Productivity Agency, with AMSA and training providers.

I also want advice from the Forum about how we can better use existing Government skills initiatives and funding sources. The Forum will be in place for no more than five years and I will review its effectiveness within two years.

As an added measure, not previously announced, I will be inviting the Navy to be represented on the Workplace Development Forum, which is being convened to help implement the skills development elements of the maritime reforms. The decision to invite the Navy reflects the central role it plays in maritime activities and the value to both the navy and broader maritime sector in expanding the pool of trained seafarers



The *Shen Neng 1* aground and leaking oil. On 3 April 2010, the 230 metre-long bulk coal carrier left the Port of Gladstone bound for China, carrying 68,000 tonnes of coal as cargo. The Chinese-registered ship was traversing a well known shipping route south of the Douglas Shoal, when it ran hard aground 38 nautical miles east of Great Keppel Island at about 5.30pm. The impact ruptured the ship's fuel tanks and released approximately four tonnes of fuel oil into surrounding waters.

LABOUR PRODUCTIVITY REFORM

The final element of the reform package is labour productivity.

We are committed to aligning Australian productivity practices with the best in the world. To do this, we will need a compact between industry and unions. I have previously said this compact must include changes to work practices, a review of safe manning levels and the use of riding gangs on coastal vessels. This compact is essential to the reform agenda.

I am aware that negotiations between industry and the unions are progressing.

2012 START DATE

Earlier I said that any meaningful reform must be bold and decisive. The new package is bold.

Now for the decisive.

When I announced the Government's election commitment to revitalise Australian shipping I said it would be in place by mid-2013. However, in the time we have been working on this major reform package we have seen more vessels leave our shores. The need to arrest this decline, combined with the hard work and focus given by all involved, has convinced the Government to bring forward this reform to commence on 1 July 2012.

THE BROADER SHIPPING INDUSTRY REFORM AGENDA

While we have been developing the coastal shipping reforms, we have not been idle in other maritime areas.

National Regulator

At the last COAG meeting the Prime Minister got the States and Territories to agree to the establishment of a single national safety body — something that has not been achieved in the 110 years since Federation.

This will greatly decrease the burden of red tape, increase regulatory confidence, remove inconsistency in the law applying to Australian commercial vessels and streamline new maritime safety plans.

By 2013 Australia will have one maritime safety regulator the Australian Maritime Safety Authority - and one law - Commonwealth law - applying to all commercial vessels in Australian waters.

Navigation Act Rewrite

We are currently rewriting the *Navigation Act 1912* to provide contemporary and robust regulation for maritime safety.

The Act is outdated and requires modernisation to better reflect current regulatory policies.

It needs to be more flexible in responding to changes in national and international safety standards.

It will contain a new penalty and enforcement regime.

We aim to have the new legislation finalised by the middle of next year.

Protection of the Marine Environment

Australia imposes high safety standards on ships to protect our environment.

However, in recent times our precious reefs and coastlines have been put in jeopardy by two major incidents involving foreign flagged ships — the *Pacific Adventurer* oil spill and the *Shen Neng 1* grounding.

To increase protection for our precious marine waters, we have recently extended the ship tracking system (REEFVTS) to cover the entire Great Barrier Reef. All large ships must regularly report their location and route and their progress will also be tracked by radio and satellite 24/7.

But our efforts to protect the Reef don't stop there. I will soon be introducing into Parliament legislation toughening penalties for breaches of our maritime and environmental laws.

CONCLUSION

This is a huge reform agenda and clearly shows the Government's commitment to revitalising Australian shipping.

In conclusion I want to state the obvious — and that is that it makes no sense, no sense at all for Australian trading to take place almost entirely in the hulls of foreign ships.

- We need to become participants, not just customers.
- We need to upgrade the fleet.
- We need to get the regulatory framework right.
- We need a "best in class" tax system for shipping.

And we need a pool of skilled seafarers to operate the ships of the future.

These reforms will confirm Australia's long term economic, environmental and security objectives. ■

'NIITAKAYAMA NOBORE'

The Imperial Japanese Navy's Attack on Oahu, Hawaii. 7 December 1941

By Ian Johnson

This year marks the 70th anniversary of the most infamous and successful large-scale surprise attack of the 20th century. It heralded a new era of naval warfare which was the eventual undoing of Japan. Historian Ian Johnson recounts "the day that will live in infamy".

On 2 December 1941 (Tokyo Time), a coded message, 'Niitakayama Nobore' ("Climb Mount Niitaka") was sent to all Imperial Japanese Navy (IJN) units. Approaching the International Date Line from the west at that time were six Japanese aircraft carriers, AKAGI, KAGA, SORYU, HIRYU, SHOKAKU, and ZUIKAKU, along with over ten escorts and supply ships.

Receiving this signal Vice Admiral Nagumo Chuichi, went to his cabin onboard his flagship, the aircraft carrier AKAGI, and opened a set of Top Secret documents, which told him, and those that opened the same order throughout the fleet, that on 8 December (the 7th on the Pearl Harbor side of the International Date Line) Japan would be going to war with the United States, Britain, and Holland. Mount Niitaka was, at the time, the tallest mountain under Japanese control, on the island of Formosa, now Taiwan.

On Sunday, 7 December 1941 (Hawaiian Time), just after midnight off the island of Oahu, Hawaii, five I class submarines, I-16, I-18, I-20, I-22, and I-24 of the IJN began *Operation Al*, a first strike against military targets of the United States of America on Oahu, with the primary objective being the destruction of the United States Pacific Fleet located at Pearl Harbor. The five I class submarines, that had left Japan on 18 November, launched one Ko-hyoteki class (Type A) midget submarine each 10 nautical miles (19 kilometres) from the entrance to Pearl Harbor.

Operation Al was the largest of six attacks that would, within an eight hour period on Monday, 8 December 1941, occur against British, and American targets in the Pacific and herald Japan's entry into the Second World War. Viewed in Japanese Standard Time on December

8, Units of the Imperial Army of Japan began landing in Malaya at 0205hrs, the attack on Hawaii at 0318hrs, attacks on the Philippines began at 0700hrs, Guam at 0725hrs, while Wake Island and Hong Kong saw their first Japanese attacks begin at 0900hrs.

At 0200 hours, over 250 miles north of Oahu, the AKAGI and the five other aircraft carriers had begun to prepare for the attack. This carrier strike force, known as the *Kido Butai*, had departed northern Japan on 26 November after more than a year's planning and training.

Their crews got over 400 aircraft ready onboard the six carriers, to launch south.

The five midget submarines made their way towards the harbour when at 0342hrs, a minesweeper, USS CONDOR (AMc-14), operating with another minesweeper USS CROSSBILL (AMc-9) near the Pearl Harbor entrance buoy, saw a submarine periscope poking out of the water. A contact report was sent at 0357 hrs and received by the destroyer USS WARD (DD-139), whose crew went to battle stations and began hunting for a possible submarine. Thirty-eight minutes later WARD stood down from the search after nothing was found. At 0458hrs the anti-submarine boom gate was opened to permit the two minesweepers to enter the harbour. For unknown reasons the boom gate was left opened for the next three hours. This allowed the midget submarines easy access into Pearl Harbor.

At 0600hrs, the aircraft carrier ENTERPRISE, now just 200 miles south west of Oahu, launched 18 aircraft on a scouting mission to clear the way for the carrier's arrival at Pearl.

Two hundred and twenty miles north of Oahu at 0605hrs, the *Kido Butai* began to launch the 1st strike wave of 183 aircraft. Commanded



Japanese Aircraft ready to take off for the attack on Pearl Harbor with another carrier astern.



TORA TORA TORA. View looking down "Battleship Row" from Ford Island Naval Air Station. Pearl Harbor is quiet and still except for the large plume of water from a torpedo strike on one of the ships in Battleship Row. The silhouette of an attacking Japanese aircraft can be seen to the right of the plume.



View looking up "Battleship Row" on 7 December 1941, after the Japanese attack. The sunken and burning USS ARIZONA (BB-39) is in the centre. To the left of her are USS TENNESSEE (BB-43) and the sunken USS WEST VIRGINIA (BB-48).

by Captain Fuchida Mitsuo, the first strike wave was divided into three groups.

The first group consisted of 90 aircraft, 40 Nakajima B5N Kate bombers armed with torpedoes, along with 50 Nakajima B5N Kate bombers armed with 800kg (1760lb) armour piercing bombs. This group was the main strike against the naval base, with any capital ships their target.

The second group of 54 Aichi D3A Val dive bombers armed with 550lb (249kg) general purpose bombs were to attack the airfields at Wheeler Field and Ford Island. The third group of 45 Mitsubishi A6M Zero fighters were assigned to strafe aircraft on the ground at Wheeler Field and Ford Island, and the airfields at Kaneohe, Hickam Field, Ewa Field, and Barber's Point, as well as providing air cover for the 1st strike wave.

Nakajima B5N Kate bombers from AKAGI were loaded with specially adapted Type 91 aerial torpedoes with a rudder extension that let them operate in shallow water. This was a lesson learned from the Royal Navy's successful carrier raid on the Italian Fleet at Taranto which, like Pearl Harbor, was a shallow harbour.

At 0630hrs, while waiting for a Harbour Pilot, crew from the General Stores Ship USS ANTARES (AKS-3) spotted a submarine conning tower behind the ship. This was reported to the WARD, which saw and engaged the Ko-hyoteki class midget submarine with its four-inch gun, before finishing it off with a depth charge attack at 0653hrs. This was the first IJN vessel sunk by the USN in World War II.

As the Japanese aircraft continued towards Oahu, they began to appear on the screen of the U.S. Army's Opana Radar Station, at Opana Point near Oahu's north coast. At 0702hrs the outpost's SCR-270 radar detected a flight of unidentified aircraft 132 miles north of Oahu and closing. After a few minutes confirming the contact, the station phoned the Intercept Center to report a large formation of aircraft approaching Hawaii from the north. Lieutenant Kermit Tyler, in charge of the lightly manned Intercept Center, presumed the contact was six B-17 bombers that were scheduled to arrive from the mainland on this day. Lieutenant Tyler told them "Well don't worry about it."

Onboard WARD they had detected another submerged target and began a depth charge attack. Three minutes later oil was spotted 300 yards astern where the depth charges were dropped. By 0707hrs WARD could lay claim to sinking two of the five midget submarines

launched seven hours earlier.

Two hundred miles north of Oahu the launch the 2nd strike wave by the *Kido Butai* had begun at 0715hrs. Under the command of Lieutenant-Commander Shimazaki Shigekazu, 168 aircraft headed towards Oahu, and like the 1st strike wave, divided into three groups. The first group of 54 Nakajima B5N Kate bombers armed with 550lb (249kg) and 132lb (60kg) general purpose bombs, were to attack the airfields at Kaneohe, Ford Island, Hickam, and Barbers Point. The second group of 81 Aichi D3A Val dive bombers armed with 550lb



The battleship USS NEVADA beached at hospital point being hosed down

(249kg) general purpose bombs were to follow up the attack on the naval base and any undamaged capital ships left after the first attack. The third group of 36 Mitsubishi A6M Zero fighters were to provide air cover for the 2nd strike wave, as well as attack Barber's Point, Ford Island, Hickam, Wheeler, Ewa and Kaneohe.

A reconnaissance seaplane launched at 0500hrs from the heavy cruiser CHIKUMA, flew over Oahu at 5,000 feet in clouds and reported to AKAGI that the main American fleet was in Pearl Harbor at 0735hrs and that the Lahaina anchorage was empty. It also informed AKAGI that the American aircraft carriers were not there.

By 0740hrs the pilots of the 1st strike wave could see the North Shore of Oahu, at the same time the Opana Radar Station lost the incoming aircraft on radar 20 miles off coast of Oahu due to interference caused by surrounding hills. No warnings were issued, no phone calls made. The Japanese aircraft began to deploy for their attack. Commander Fuchida ordered the attack on military bases on Oahu at 0749hrs.

As Commander Fuchida's aircraft headed for their targets, they noticed that there are no enemy aircraft in the sky, even as they flew over Oahu they had not been intercepted by American fighters, nor lashed with anti-aircraft fire from the ground. Fuchida realised that they had caught the Americans unprepared. At 0753hrs Fuchida sent a coded phrase to AKAGI and VADM Nagumo that they have achieved maximum strategic surprise, the phrase was "TORA TORA TORA" (Tiger, Tiger, Tiger)

At 0753 hrs eight A6M Zero fighters from SORYU and 27 D3A Val dive bombers from ZUIKAKU began to bomb Wheeler Army Airfield. Ironically P-40 Warhawks and P-36 fighter aircraft had been parked wing tip to wing tip in the open to prevent sabotage. However, this made them perfect targets for the Val dive bombers and Zero fighters. The Val dive bombers struck first, destroying hangars workshops, supply dumps and other facilities, then, when the dive bombers were done, the Zero fighters flew in and conducted three strafing runs

against the parked fighters, setting them on fire. Also strafed was the Scholfield Army Barracks, located next to Wheeler. With Wheeler Field in flames, SORYU'S Zero fighters then headed south west.

At approximately 0755hrs at least 14 A6M Zero fighters from AKAGI, KAGA and HIRYU began to strafe the planes on Marine Corps Air Station Ewa Field. At the same time Kaneohe Naval Air Station came under attack by 11 A6M Zero fighters from ZUIKAKU and SHOKAKU, strafing the 33 PBV Catilinas that were moored there.

Seventeen D3A Val dive bombers from SHOKAKU began to bomb Hickam Army Air Field and Naval Air Station Pearl Harbor on Ford Island, in the middle of Pearl Harbor. Their targets were the aircraft parked on the aircraft apron.

At 0755hrs the first torpedo attack began. Ninety Nakajima B5N Kate bombers from AKAGI, KAGA, SORYU, and HIRYU, armed with torpedos, along with nine D3A Val dive bombers from SHOKAKU attack the US battleships moored at Battleship Row. Over the next two hours the prime targets of the attack, the battleships TENNESSEE (BB-43), WEST VIRGINIA (BB-48), NEVADA (BB-36), OKLAHOMA (BB-37), ARIZONA (BB-39), CALIFORNIA (BB-44), MARYLAND (BB-46), with PENNSYLVANIA (BB-38) in Dry Dock No.1, along with the rest of the fleet, would be subjected to the most violent attack America had seen since the Civil War. It was the first 20 minutes of the attack that the most damage was done.



An aerial view of the attack on Wheeler Field.

At 0757 hrs 26 B5N Kate bombers from AKAGI and KAGA started their torpedo runs. Coming from the south east, they targeted the battleships along Battleship Row. OKLAHOMA was the first to be hit, with one of nine torpedos that would hit her during the attack. Moments later, CALIFORNIA received the first of two torpedo hits portside, her crew began counter flooding to keep the ship level and afloat. Yet as this was happening the crew of NEVADA still managed to raise the flag at 0800hrs. A second torpedo hit CALIFORNIA. WEST VIRGINIA took nine torpedo hits, including two from one of the two remaining Ko-hyoteki class midget submarine that managed to enter the harbour, before sinking. OKLAHOMA suffered multiple hits and heeled 45 degrees to port, finally capsizing at 0810hrs. NEVADA was hit by a torpedo in the port bow, but was able to get underway at 0830hrs.

At 0800 two groups of American aircraft flew into Oahu airspace not knowing of the ongoing attack. The B-17's Lt Tyler had been expecting from the mainland were arriving at Hickam Field. While 18 aircraft from ENTERPRISE were arriving from the southwest going to Ford Island. Both groups were fired on by both sides, with several aircraft shot down as some made their way to other airfields.

Then the nine D3A Val dive bombers from SHOKAKU began their bombing runs against Battleship Row. ARIZONA was hit by a bomb on her No.4 Turret at 0805hrs, as was the repair ship USS VESTAL (AR-4) moored outboard ARIZONA. At 0806hrs another bomb struck ARIZONA, hitting the forward magazine. ARIZONA detonated, wrecking the ship and sinking her. Then, as SHOKAKU'S Vals, along with AKAGI and KAGA'S Zeros withdraw from Battleship Row, they attacked Ewa Field before heading north.

At 0817 the destroyer USS HELM (DD-388), which had just made it out of the harbour, spotted a Ko-hyoteki class submarine attempting to escape. The midget submarine had, since being released by her mother submarine, tried to enter the harbour only to run aground on the sea floor near the entrance. After freeing itself, the midget submarine, hearing the attacks by the WARD against the two other midget submarines, attempted to escape via the east side of Oahu, but had ran aground on a reef in Waimanalo Bay. The midget submarine had just freed itself when the HELM attacked, forcing the midget submarine back on the reef. Both crewman got out but only one, Ensign Sakamaki Kazuo, made it to shore and was promptly captured. Becoming the first Japanese prisoner of war in the USA.

Over Bellows Field, a lone Zero from SHOKAKU strafed the buildings and tents at 0830hrs. Five minutes earlier, one of the B-17's had crash landed on the runway.

At 0839hrs a second Ko-hyoteki class submarine was spotted by the seaplane tender USS CURTISS (AV-4). After signalling the threat to the underway destroyer USS MONAGHAN (DD-354), CURTISS opened fire with her 5-inch gun, hitting the midget submarine in the conning tower. The midget submarine fired her torpedos at the CURTISS, missing the seaplane tender before MONAGHAN conducted a depth charge attack and sank the midget submarine four minutes later.

As aircraft from the first wave began the journey back to the *Kido Butai*, 0855hrs saw the 2nd strike wave led Lieutenant-Commander Shimazaki Shigekazu began its attack. By now, American defences, those not already destroyed, were ready to respond with anti aircraft fire. Eight Zeros from HIRYU strafed the Kaneohe Naval Air Station before heading for Bellows Field. They were followed immediately by 18 Kate dive bombers from SHOKAKU which bombed the base, destroying Hangar 1. Ten minutes later Fighters from SORYU who were providing air cover, then proceeded to attack. One was shot down by ground fire and another damaged. Thirty three PBV Catilinas



In Drydock Number One at the Pearl Harbor Navy Yard on 7 December 1941, immediately following the Japanese attack. The destroyers, USS CASSIN (left) and DAWES (right) were severely damaged by bomb hits and resulting fires. In the background, also in Drydock Number One, is USS PENNSYLVANIA (BB-38), which had received relatively light damage in the raid.



The capsized hull of USS OKLAHOMA (BB-37), with a barge alongside to support rescue efforts, probably on 8 December 1941.

were destroyed, along with 80% of the base. Eighteen servicemen were killed.

At 0900hrs eight Zeros from HIRYU arrived at Bellows Field. Two P-40 Warhawks were beginning to launch but were quickly shot down. The Zeros then began to strafe the airfield causing damage to buildings and damaging several aircraft.

At 0902 hrs the second wave of 34 Val dive bombers from SORYU and HIRYU started attacking at Battleship Row. Their escorts, nine fighters from KAGA, strafed Hickam Field, then Naval Air Station Pearl Harbor, before heading north to Wheeler Field. Nine Kate dive bombers from SHOKAKU also attacked Naval Air Station Pearl Harbor with 550lb bombs.

Twenty six Vals from KAGA were the last to attack, hitting WEST VIRGINIA and MARYLAND before diverting the strike to target the underway NEVADA. The Vals hit NEVADA with at least five bombs. Onboard NEVADA the senior officer, Lieutenant Commander Francis Thomas, realised that if his heavily damaged ship sank in the harbour entrance it would block off the base to the ocean. He thus ordered the battleship beached at Hospital Point at 0920hrs.

At 0910hrs, Marine Corps Air Station Ewa Field was attacked again, this time by Val dive bombers from HIRYU and AKAGI. However, four of

the Vals were shot down by two P-40 Warhawks that survived the first wave of attacks on Wheeler Field. The damage at Ewa was 32 Aircraft destroyed and 15 damaged, along with five dead and 13 wounded.

At 0915hrs at Wheeler Field Army Air Base, seven Zeros from KAGA strafed Wheeler and Schofield Barracks on their return leg. Fifteen minutes later 16 of KAGA's Vals also strafed the base, but two are shot down by the same two P-40 Warhawks that had just returned from Ewa. Out of the 142 aircraft at Wheeler Field, 42 were destroyed and 56 badly damaged.

After being missed in the attack, the light cruiser USS ST LOUIS (CL-49) got underway at 0935hrs. At the harbour entrance at 1000hrs the cruiser spotted two torpedos astern, fired by the last surviving Ko-hyoteki class submarine. This midget submarine briefly surfaced and was fired on before escaping.

The first Japanese aircraft began to return to their carriers at 1000hrs, as did damage assessment reports. By 1100hrs the attack on Oahu was over. However, Commander Fuchida had remained circling over the smoking ruins of Battleship Row to assess the damage his aircraft had caused before flying north to rejoin the *Kido Butai*. The American death toll would come to 2,331 military personnel, 2,107 Navy and Marines, 233 Army, with 48 Civilians killed, mostly by unexploded anti-aircraft shells landing in civilian areas. 1,109 were wounded during the attack, 710 from the Navy and Marines, 364 Army and 35 civilians.

The USN battleship losses were major. OKLAHOMA took nine torpedo hits and capsized. Only 32 of her crew survived. CALIFORNIA was struck by two torpedoes and hit by a bomb - she sank three days later. Like OKLAHOMA, WEST VIRGINIA suffered nine torpedo hits, and sank by the end of the attack. TENNESSEE was struck by two bombs and was damaged by oil fires from ARIZONA, but remained afloat. MARYLAND took two bomb hits and had light to moderate damage. PENNSYLVANIA suffered moderate to heavy damage in Drydock 1.

Although beached by the end of the attack NEVADA was repaired and modernised and rejoined the fleet by the end of 1942. ARIZONA was a total loss. The hit on her forward magazine and the massive explosion that followed broke the ship's back and she quickly sank, taking over 1,100 of her crew with her.

The USN also lost USS UTAH (AG-16) and USS OGLALA (CM-4), while the light cruisers USS HELENA (CL-50) and USS RALEIGH (CL-7) were both hit by a torpedo. VESTAL, moored alongside ARIZONA, was



The iconic remains of the USS ARIZONA just below the surface in Pearl Harbor today. The memorial is the centre for commemoration services for the Pearl Harbor attack. The ship is still considered a commissioned unit of the USN and actually still leaks fuel oil to this day. (USN)



heavily damaged. The seaplane tender CURTISS was also damaged, while the destroyers USS CASSIN (DD-372), and USS DOWNES (DD-375) were destroyed while in Drydock 1. While in floating drydock YFD 2, USS SHAW (DD-373) took heavy damage when two bombs penetrated her forward magazine.

Of all the battleships attacked at Pearl Harbor on that day only two, ARIZONA and UTAH, failed to make it back into service to attack Japanese forces.

In the surprise attack 169 American aircraft were destroyed. Ninety eight USN aircraft, 32 from Marine Corps Air Station Ewa Field, 26 from Naval Air Station Pearl Harbor, 34 from Kaneohe Naval Air Station, and six aircraft from ENTERPRISE. The US Army Air Corps lost 77 aircraft, including 20 from Hickam Army Air Field, 42 from Wheeler Army Airfield, and four from Bellows Army Air Field. 150 aircraft were damaged, 128 Army Air Corps, 31 Navy.

Just after 1300hrs Commander Fuchida landed on board AKAGI, where he quickly joined a major discussion between several Japanese junior officers, including Commander Genda, and VADM Nagumo and his staff, on the possibility of launching a third, and if time allowed, a fourth strike against Oahu. Both Genda and Fuchida wanted the third strike in order to destroy as much of Pearl Harbor's infrastructure as possible. But as time dragged on, Nagumo had other concerns. The refuelling oilers were already heading north and, even with Fuchida's damage assessment Nagumo was still worried about a possible counter strike against the fleet. His concern was not knowing where the American carriers were, but he was sure they knew from the attack where the *Kido Butai* now was?

Japanese losses in *Operation Al* were light. Fifty five Japanese airmen and nine submariners killed and one submariner captured. Twenty nine aircraft were lost in the attack, nine in the first attack wave, 20 in the second, with another 74 damaged by anti-aircraft fire while all five Ko-hyoteki class (Type A) midget submarines were lost.

The inability by Commanders Genda and Fuchida to convince VADM Nagumo to continue to attack Oahu had far reaching consequences. Although the battleships, other vessels and the airfields were badly damaged, nearly all of Pearl Harbor's infrastructure remained intact.

The biggest failure of the day was that these facilities such as repair shops and supply depots were undamaged, allowing the USN and the Army to recover on Oahu far quicker than anyone thought.

But it was the failure by the *Kido Butai* to destroy three particular American targets, two listed on the attack order, the third was not, that would ultimately defeat Japan.

The first was not attacking the huge fuel farm at Pearl Harbor. With it intact, the Americans could operate from Oahu using the fuel to launch strikes against Japanese targets far quicker than planned.

The second failure was in not locating the aircraft carriers LEXINGTON and ENTERPRISE. If a third strike had taken place, there was a chance that ENTERPRISE, which was heading for Oahu in response to the attack, would have been spotted either by Japanese submarines or aircraft. VADM Nagumo would have then attacked, and with the airpower of the *Kido Butai's* six carriers, would have sunk ENTERPRISE and her escorts. By this time, LEXINGTON, coming in fast from Midway, might have been spotted as well and sunk. If this had happened, the only US carrier left in the Pacific would have been USS SARATOGA (CV-3), which was approaching the west coast at the time of the attack. With only one carrier left, it would have been used in a defensive role off the US west coast and Panama Canal. Even with the loss of one carrier on the day, it would have put US war plans back at least a year, allowing the Japanese to fortify their positions and build more carriers, making the Pacific campaign longer and harder.

The Japanese did not see the third failure. The Japanese Navy, from the top downwards, believed in the World War One thinking that battleships, not aircraft carriers or submarines, would fight the ultimate battle in the Pacific. The Japanese use of submarines was mostly in a support role, i.e. reconnaissance, supply, transport. The failure to attack any part of the USN's submarine force, whether it was the submarines themselves or the submarine base, with repair shops, weapons stores and the headquarters of the USN's submarines, would ultimately lead to the destruction of Japan's supply lines, and bring the Japanese economy to its knees.

The USN's use of their submarines as an offensive force brought transportation of oil and raw materials to a mere trickle, with most the USN's submarine operations directed from Submarine Headquarters at Pearl Harbor. But the Submarine Headquarters had one other group based there whose work would lead to some of the USN's greatest victories. In the basement of Submarine Headquarters was the cryptanalytic unit under Commander Joe Rochford, whose breaking of the Japanese naval codes led to the USN's Midway victory and much of the Submarine Forces' success. ■

March 22, 2009: The remains of a Japanese mini-submarine lie on the seafloor under 1,000-feet of water near Pearl Harbor, Hawaii. The Imperial Japanese Navy launched 5 mini-sub from "mother" submarines hours before the Dec. 7, 1941 attack on Pearl Harbor to torpedo ships ported in Pearl Harbor. (Photo courtesy of Lone Wolf Productions/Released)



The only other battleship not to make it back into service was the UTAH. Seen here as she is today in Pearl Harbor off Ford Island. (USN)

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 future reintegration of New Zealand as a full partner.
- Urges close relationships with regional powers and particularly 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.
- Advocates a significant deterrent element in the ADF capable of powerful retaliation at considerable distances from Australia.
- Believes the ADF must be capable of protecting essential shipping both coastally and at considerable distances from Australia.
- 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, while noting the important peacetime naval tasks including border protection, flag-showing/diplomacy, disaster relief, maritime rescue, hydrography and aid to the civil power:

- Supports the concept of a Navy capable of effective action in war 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 the future force include nuclear-powered vessels.
- 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.
- 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 and advocates a continuous naval ship-building programme.
- Advocates the retention in a Reserve Fleet of Naval vessels of potential value in defence emergency.
- Supports a strong Naval Reserve to help crew vessels and aircraft and for specialised tasks in time of defence emergency.
- Supports a strong Australian Navy Cadets organisation.
- Advocates improving conditions of service to overcome the repeating problem of recruiting and retaining naval personnel.

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.

Pacific 2012 Maritime Congress comprising: **Pacific 2012 International Maritime Conference** **Royal Australian Navy Sea Power Conference 2012**

31 January – 2 February 2012
Sydney Convention & Exhibition Centre,
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Image courtesy of RAN



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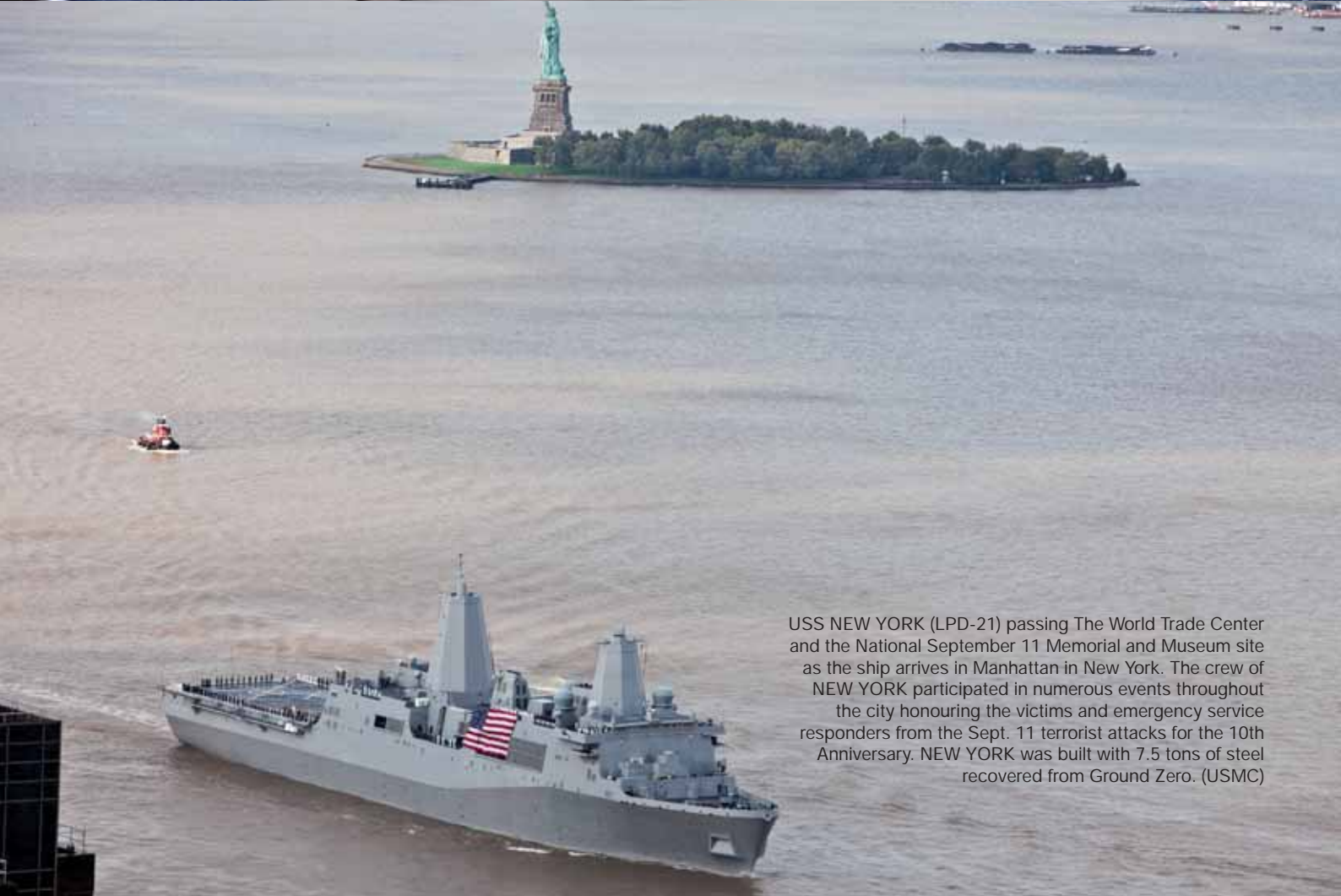
The theme of the Sea Power Conference 2012 is 'The Naval Contribution to National Security and Prosperity'. It is aimed at informing how navies contribute, on a daily basis, to the defence and wellbeing of their nation and its interests.

For further information and to register visit: **www.seapowerconference.com**



Image courtesy of Austal, Australia 2011.

HMAS SYDNEY firing an ESSM (Evolved Sea Sparrow Missile) during tests of the ship's upgrades in the waters of the Pacific Missile Range Facility off Hawaii. Also just visible to the left of the image above the bridge wing is the top of a Nulka off board decoy being launched simultaneously. A good example of hard and soft kill being used together to increase the chances of defeating an incoming missile threat. (RAN)



USS NEW YORK (LPD-21) passing The World Trade Center and the National September 11 Memorial and Museum site as the ship arrives in Manhattan in New York. The crew of NEW YORK participated in numerous events throughout the city honouring the victims and emergency service responders from the Sept. 11 terrorist attacks for the 10th Anniversary. NEW YORK was built with 7.5 tons of steel recovered from Ground Zero. (USMC)