

THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

**SUBMARINES
– PART I**

**THE INVINCIBLE CLASS
LIGHT CARRIERS**

CORAL SEA 2017

**STRATEGY, THE ADF AND
AMPHIBIOUS WARFARE**



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THE NAVY

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Front cover:

HMAS TOBRUK Passes on the Baton to HMAS CANBERRA on Paying Off.

THERE IS A TIME FOR EVERYTHING

The July editorial introduced the theme of cross over and step changes; while this issue considers time, timing and tempo (the 3 Relatives) and Ecclesiastes a 'season for every activity'. This issue presents an argument for testing and developing the assumptions behind our Future Submarines; it considers the development of the *Invincible* class of carriers in the UK, with parallels to our LHDs; it examines Australian Amphibious strategy, beyond 2017 and concludes with a paper on the Battle of the Coral Sea.

There is considerable debate about: future submarines; the Defence White Paper; the role of LHDs and 'Amphibiousity' or Littoral Warfare – some well-informed; some less so. This year's Talisman Saber exercise is a case in point. This will be the last of these exercises in which RAN will not be playing a major amphibious role, involving HMA Ships CANBERRA and ADELAIDE. The exercises also represent a significant element of the USMC roulement through the Top End; reflecting Australia's strategic defence and security posture in the region. Yet, to read the Defence web page (Jul 15), Talisman Saber is a PC apologia: '[safeguarding] the environment'; 'protecting endangered species and marine mammals through a comprehensive framework of risk mitigation procedures'; developing 'Public Environment Reports'; '[collecting] key environmental data'; 'environmentally [assessing this data regarding] heritage issues relating to the conduct of Talisman Saber 13' and providing 'environmental fact sheets' to 'community members'. Call this Editor old generational but somewhere in Defence's own webpage / lexicon, one would expect a nod in the direction of military purpose and the fact that this is about the defence of our country, economy, liberty and way of life? Or are our potential enemies to believe that, on encroaching Australian sovereign shores, they will be met by some dangerous-looking, sandal-hugging bureaucrat asking them to 'provide a comprehensive framework of risk mitigation procedures', or some other such Canberra-Orwellian inspired gobbledygook?

We undertake exercises and enjoin the Alliances we do, for the very purpose of deterring war; not inviting it in with an environmental cheat-sheet. Deterrence is about the 'other' believing in you –

knowing Australia has the will, capacity, capability and endurance to be the last one standing, if necessary. Anything that detracts from that posture, deducts our deterrence and so makes war more likely, not less. It is perhaps time for the all-powerful Department of the Prime Minister and Cabinet – that duplicates all departments, including Defence – its 1500(!) consultant political advisers (with a few senior politicised APS) to read Machiavelli, Clausewitz and Sun Tzu; heed their world-beating baristas and listen more to the politicians and people (they serve). And it would be nice for the DoD, rather than being a proxy for the Attorney General and Green lobby Inc., to return to doing what it should be about: defending Australia and being ready and able to fight and win as tenaciously, aggressively, thoughtfully, articulately and respect-inducingly as possible, when required. It was just such a deterrence policy and its implementation that underwrote Tony Abbott's successful 'Turn Back the Boats' policy.

This returns to the opening gambit; that there is a season for every activity. We need to understand the times we are in; noting that, much as we would like this to be a time of peace, the evidence is to the contrary. We are in a time when we need to be both 'tearing down and designing and building afresh'; 'gathering stones and girding our own'; '[re]searching for the new and throwing away the old'; 'educating our people; while preparing for peace'; speaking quietly and carrying a big stick. A critical problem of the previous 15 years of near-global conflict (NGC) is that many public servants, officials and ministers have continued to engage with a peace time mentality (PTM) – which extends also to senior Defence leadership, in and out of uniform. The young Lieutenant Commanders and Chief Petty Officers of today have known little other than conflict; many deploying in support of Army and Air operations when not at sea. They have seen Kipling's twin imposters of success and failure and, over the next 15 years, they will replace the Chiefs of today. While adroit positioning of ADF has avoided the twin strategic failures invited on the UK Armed Forces by the UK Chiefs of General Staff (promising too much and delivering too little), the US, UK and AS military know that 'we' have not succeeded, strategically. And the illiberal alliances know and feel the same – that

Harriers Operating from JUAN CARLOS I (L61) June 2014



USMC F-35 B Ski Jump Trials,
August 2015.



this is 'their time; not ours'. Hence the encroachments on Liberal Democratic sovereignty, be it territorial, maritime or Cyber. We only have to look to the shenanigans in the South China Sea to know this to be the case.

Media briefing suggests that Defence officials declined the then PM's 'proposal to put F-35 fighter jets on [HMA Ships CANBERRA and HMAS ADELAIDE]' due to 'the ships [requiring] extensive reworking and the project [being] too costly'. It is these same 'Defence officials' (uniformed and not) who would seek to decline the acquisition of Australia's twelve future submarines, despite cross-party political support, and who have been responsible for previous procurement decisions now requiring the dismantling of the Defence Science & Technology [Group]; the Defence Materiel Organisation and the

Capability Development Group by the (yet to deliver) First Principals Review: more PTM! This column believes we need to start thinking and designing 'as if we were not at peace' – and this requires a different mentality entirely. It means making use of perfectly good commercial designs and applying them in a dual-use military setting. It means not taking twenty years to build and deliver on capabilities, when they are needed today, for tomorrow: not tomorrow, for never. And it means developing a critical strategic thinking capacity in Navy, in Defence, in the APS, research, higher education, industry and amongst our future politicians.

Tony Abbott was right about F-35 operating from CANBERRA and ADELAIDE, and these ships are well-able to do so, today. They are equally capable of operating – or at least lily-padding – USMC AV-8B Harrier II+ and they may well be doing [both] in Talisman Saber 17. DWP 2009 was right about 12 Submarines, in fact it originally wanted 14 – and, Navy is going to get up to 12, under some form of dual-build arrangement to be substantially

built in South Australia. At the same time, this column takes the view that Australia needs to be more asymmetric still and start thinking with much less of a peacetime mentality. A mentality that would work with world-class Australian ship builders to design / build / fit / crew perfectly adequate commercial vessels as warships (and submarines) – painting them grey / black, if necessary. We also may need to articulate and describe the conflicts we are in, today, so we can begin to shape tomorrow's peace. If this is not yet a time of general war (and for those of us who have seen war first hand, forefend that it should become so), then at least we should take the time we have to design a lasting and better peace. A good starting point may be through the quiet and professional delivery of the Navy League's own Statement of Policy, see page 32. ■

USMC F-35B STOVL taking off from the USS WASP (LHD-1) in 2014



NAVAL SHIPBUILDING — A CONTINUOUS BUILD PROGRAMME!!

On 4 August at a joint press conference with former Prime Minister Tony Abbott and the Defence Minister announced that there is to be a continuous build of surface warships in Australia. Australia's shipbuilding workforce will build the Navy's Future Frigates and Offshore Patrol Vessels. In its announcement the Government said that it will bring forward the Future Frigate Programme with a continuous onshore build programme to commence in 2020. The Future Frigates are to be built in South Australia. The Government further announced that it is bringing forward construction of the Offshore Patrol Vessels by two years, with a continuous onshore build commencing in 2018.



The 2009 Defence White Paper.

A number of interesting points emerge from the Government announcement.

Adelaide will hereafter be the principal naval shipbuilding centre for Australia.

There is to be a Competitive Evaluation Process. Any builder which participates in the process will have to proceed on the basis that they will build in Adelaide.

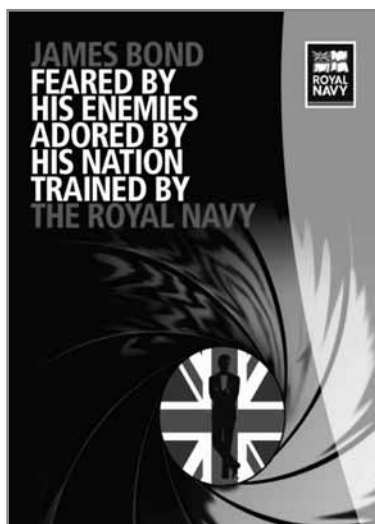
The then Prime Minister in the press conference following the announcement said "the yard for building major surface warships will be here in Adelaide, because the infrastructures here. Now the

subordinate yard may be in South Australia, it may be somewhere else, it may be Williamstown, for instance, but the major focus for surface shipping will be here in Adelaide.

The frigate build will be clearly the largest surface ship programme Australia will run for many years. Depending upon how many ships are eventually produced it is likely the proposed frigate build will run to 2040.

There was no explicit announcement as to where the Offshore Patrol Vessels would be built. However, in the Government announcement it stated that "with a continuous onshore building programme commencing in 2018 this will maintain around 400 skilled jobs that would otherwise have been lost. It would also reduce the number of man-hours that would be wasted on the Future Frigate programme if the existing workforce was disbanded and reconstituted...."

It seems clear that these jobs will be retained in Adelaide to ensure a smooth start to the Future Frigate programme. This is sensible. Presumably this means the Offshore Patrol Vessel build will start, in 2018, in Adelaide.



RN Young and Rubicam (Y and R) recruiting advert circa 1997.

It was notable that Tony Abbott, when speaking of the Offshore Patrol Vessels on several occasions, used the word Corvettes.

In the press release it was said that the Offshore Patrol Vessels are to replace the Armadale class patrol boats. Later at the press conference the then Prime Minister said "we'll have an ongoing build of the minor fleet units, the Offshore Patrol Vessels, Corvettes, the mine hunters, and so on."

The 2009 Defence White Paper included an announcement that the RAN would acquire twenty 2,000 tonne offshore combatant vessels.

It was envisaged that these vessels would replace the patrol boats, the mine hunters and the hydrographic ships.

Was the then Prime Minister's talk of "Offshore Patrol Vessels, Corvettes, the mine hunters, and so on" an updated version of the 2009 proposal?

The Navy League of Australia welcomes the Government announcements.

The League has long argued for a continuous build programme. In our Statement of Policy, which appears on page 32 of this magazine, the League cites the fundamental importance of a stable and continuous shipbuilding programme. In my President's Page in the previous edition of The Navy I expressed the hope that "when the Government decide on the Future Frigate it will follow the many recommendations made over the years, including most recently in the RAND Report, and adopt a continuous build strategy."

There is a lot to do before the Future Frigates and Offshore Patrol Vessels join the RAN. But with these announcements important progress has been made.

It is to be hoped that when Malcolm Turnbull's Government decide on the Future Frigate it will follow the many recommendations made over the years, including most recently in the RAND Report, and adopt a continuous build strategy.

A LITTLE LIGHT AT THE END OF THE TUNNEL?

For a number of years now, in this magazine and elsewhere, there have been articles and comments expressing concern about the decline of the Royal Navy. Criticism of the UK government has been particularly strong in some quarters of the United States.

In a recent visit to Britain I thought I saw a faint glimmer of light at the end of the tunnel

First, after much dragging of heels the UK government has committed to spending 2% of GDP on defence.

Second, while watching television one night in London I saw two rather good recruitment advertisements for the RN.

It is probably being unduly optimistic, but I thought worth reporting.

THE 75TH ANNIVERSARY OF THE BATTLE OF THE CORAL SEA

It used to be that the Coral Sea battle was commemorated each year with marches through our capital cities, speeches, visits from USN ships and so on. Over time most of this has drifted away. A nautical version, I suppose, of the saying, old soldiers never die, they simply fade away.

2017 will be the 75th anniversary of the Coral Sea battle, which took place from 4 to 8 May 1942.

In 2017 there are to be a number of events timed to coincide with the Coral Sea anniversary. I understand that the Pacific International Maritime Exposition 2017 and Sea Power 2017 will be held in the new Darling Harbour Conference Centre. Exercise Talisman Saber 17 will also coincide with the anniversary.

Midway was the defining naval battle in the Pacific, but Coral Sea was important, especially for Australia and the RAN. ■

AUSTRALIA AND ITS 21ST-CENTURY DEFENCE NEEDS: SUBMARINES – PART I

By John Strang

In the course of defining Australia's defence acquisition program to replace its ageing Collins-class submarines, we risk repeating mistakes of the past. Replacement without foresight could be more dangerous than no replacement at all. A new government Defence White Paper, expected to appear at the same time as this article goes to print, will almost certainly reiterate a major tenet of a previous 2009 White Paper – that is, recommend that the Navy acquire 12 new submarines.[1] This is the first of two papers addressing Australian Defence Needs in the 21st Century.

The Navy League has expressed its view that the nuclear-powered submarine option is one worthy of consideration, adding that it 'strongly supports the acquisition of large, long-range and fast submarines with endurance, and – noting the deterrent value, reliability and huge operational advantages of nuclear-powered submarines and their value in training our anti-submarine forces – urges the consideration of nuclear power as an option for those vessels'.

The decision-making process on the new submarines needs to be guided by one overarching research question:

'how can Australia best protect its country's sovereignty?'

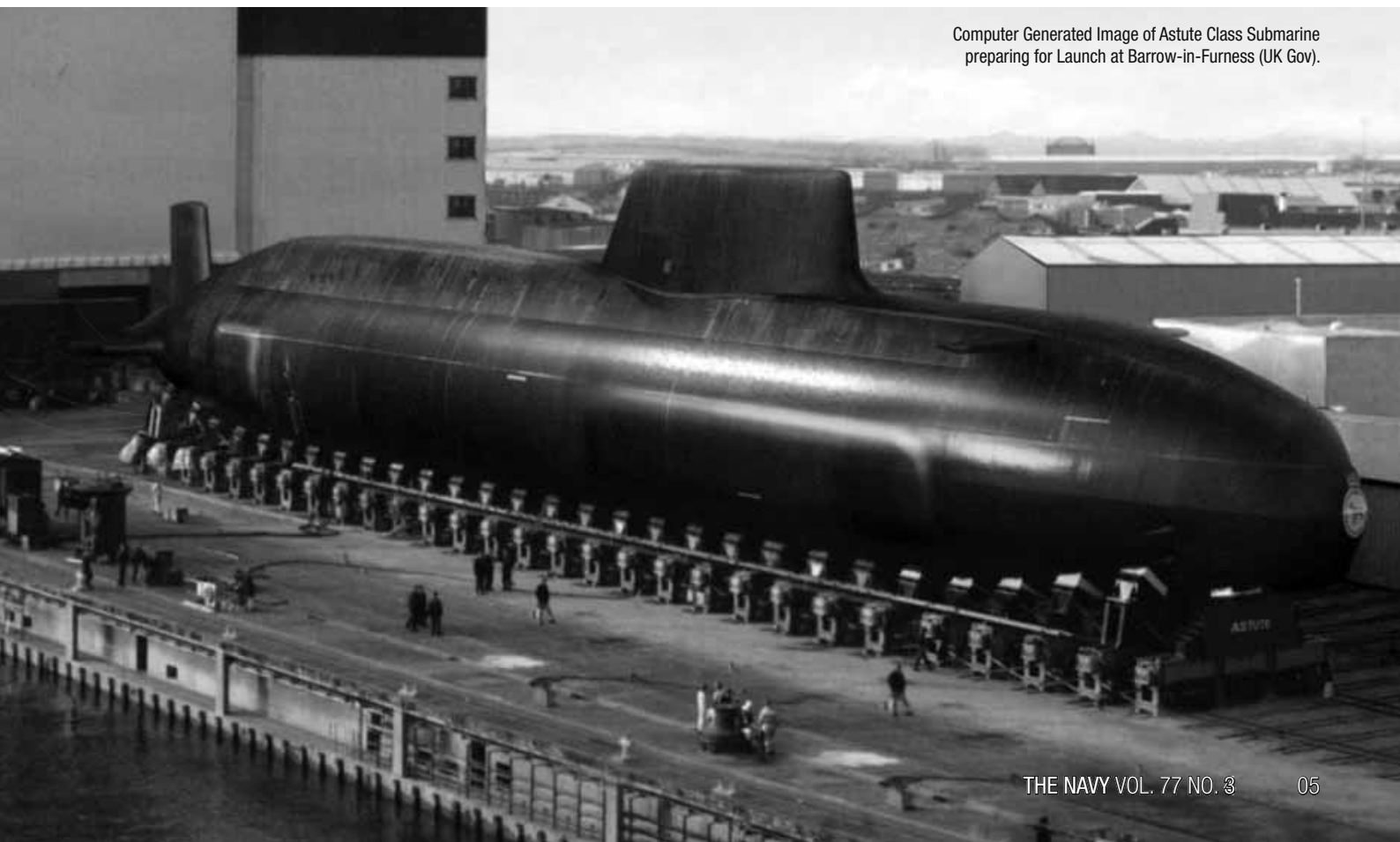
To adequately address this key dimension we should ensure that the final decision is not made in isolation from the broader issue of contributing to the overall development of our island-continent nation. The challenge goes well beyond the choice of a new submarine as a trophy item that works at least moderately well over the long-term.

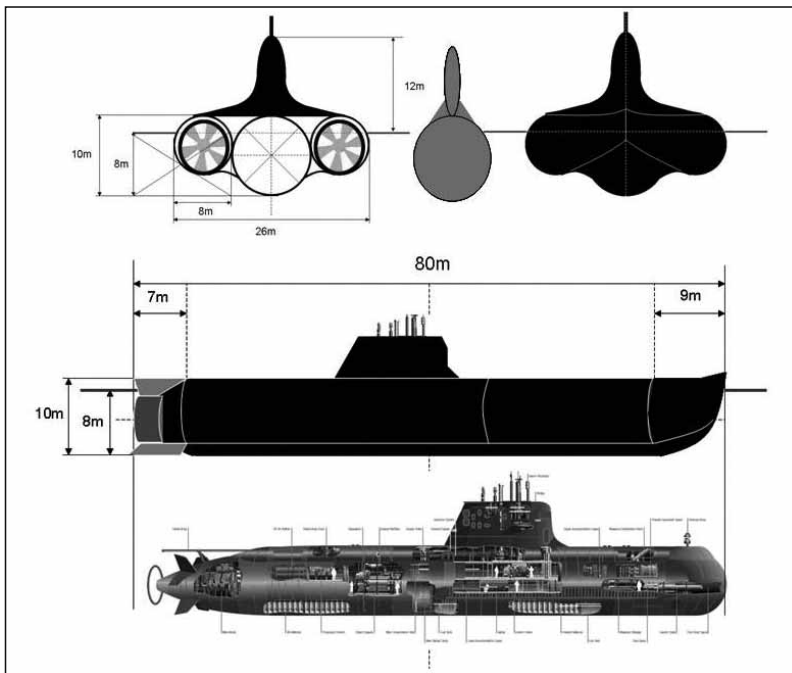
The debate on the merits of nuclear-powered submarines for Australia is long overdue. The advantages of nuclear-powered propulsion can be summarised briefly: it would extend the distances Australia's submarines

can traverse, thereby enhancing our nation's capacity to be a major contributor to the maintenance of peace in the Indo-Asia-Pacific region, and generate substantial spin-off benefits for the economy – and not just in defence-related industries.

Business commentator Robert Gottliebson remarked on how the Department of Defence 'often places orders before design is completed, which, as we know in infrastructure building, can lead to big cost overruns'. He warns that 'the fact that there is always a cloud hanging over the future of defence ship-building makes it hard to attract the best people'. He describes how 'a bright spark high in the Defence Department', in a bid to make savings 'to appease Treasury', slashed the long-term maintenance budget of the Collins-class submarines. The result? The short-term savings have entirely evaporated as a result of expensive catch-ups [2]. Australia's chief defence scientist Dr Alex Zelinsky, the CEO of DSTO, has been responsible for seeking ways to overcome the problems that have dogged the Collins. Earlier this year he pleaded: 'You've got to involve the science and technology (S&T) and engineers earlier rather than bringing them in later to fix problems.' [3]

Computer Generated Image of Astute Class Submarine preparing for Launch at Barrow-in-Furness (UK Gov).





Conceptual Design for a Versatile Modular System (VMS) Boat Hull SSK alongside a Tear Drop Collins Class SSK (RCB).

HIC SUNT DRACONES

'In 2013 and 2014, China launched more naval ships than any other country and is expected to continue this trend through 2015-16.'

In April, the Pentagon's Office of Naval Intelligence (ONI) released this assessment of China's naval capabilities for the years ahead; adding: 'major qualitative improvements are occurring within naval aviation and the submarine force, which are increasingly capable of striking targets hundreds of miles from the Chinese mainland.'

It should be remembered that, during the 1990s, Japan launched more naval ships than any country other than the U.S., so China could fairly claim to be 'just catching up' now that it has the money. The ONI assessment, however, described the commissioning of the Kuznetsov-class LIAONING aircraft-carrier – despite its reported 'limited combat capability' – as a 'milestone'; indicating that China is building a large fleet in order to acquire the status of a great power [6]. In March this year, the commander of the U.S. Pacific Fleet, Admiral Harry Harris, sharply criticised China's controversial land reclamation program, known as the Great Wall of Sand, in contested territory in the South China Sea; noting:

'China is building artificial land by pumping sand on to live coral reefs – some of them submerged – and paving over them

with concrete. China has now created over 4sq km of artificial landmass, roughly the size of Canberra's Black Mountain Nature Reserve.'

Harris warned that China's policy had the potential to escalate regional tensions to dangerous levels. [7]. Perhaps the Chinese learnt this island-creation technique from an Asian neighbour, Japan, which undertook a similar enterprise in Micronesia during the 1930s. The Japanese called the islands 'stationary aircraft carriers'.

Earlier this year China's President Xi Jinping, on the eve of an official visit to Pakistan, announced he would be launching 'energy and infrastructure projects worth \$US46 billion', and finalising a deal to sell Pakistan eight new submarines in order to cement ties between the two countries. A Reuters report opined that, 'If the submarine deal is signed, China may also offer Pakistan concessions on building a refuelling and mechanical station in Gwadar, a defence analyst said. China's own submarines could use the station to extend their range in the Indian Ocean' [8].

China is not the only power in the Asia-Pacific region. One experienced Australian naval observer has suggested that the other Asian countries regarded as having significant and threatening submarine forces are Japan, India and Russia. It is noteworthy that three of them – China, India and Russia – have nuclear submarines. At present, it appears that Beijing

AUSTRALIA'S STRATEGIC ENVIRONMENT

The West faces a highly volatile international scenario. It is against this backdrop that careful consideration should be given to Australia's naval and other defence requirements. Dr Mark Thomson of the Australian Strategic Policy Institute (ASPI) has shown how Australian defence spending under Prime Ministers Kevin Rudd and Julia Gillard, between 2007 and 2012, was allowed to decline to only 1.5 per cent of GDP, a level not seen since 1938, see Kelly [4].

The Asia-Pacific region is the scene of developments that should concern us all. This was highlighted by a study commissioned earlier this year by the Japanese Foreign Ministry. A Japanese commentator, Nozomi Matsui, wrote: 'China will acquire a dominant position in the Asia-Pacific region within 20 years if the United States lowers its involvement in the region. ... [A] group of experts said Japan should make positive approaches to the United States and other countries concerned to prevent such a scenario, which could destabilize the region.'

The Japanese report envisaged both a 'desirable scenario' and an 'undesirable scenario' for Japan 'in regard to each country or region, such as the United States, China and South Korea'. It warned that, if an inward-looking trend continued in U.S. foreign policy, the 'law of the jungle' would prevail in the Asia-Pacific region. As a result, it said, 'China will acquire a dominant position, and Japan will face major difficulties.'

The Japanese report also predicted that South Korea would strengthen its ties with China and, as a result, 'the importance of Japan-South Korea relations in South Korea will decline'. It warned, 'If Japan repeatedly changes its policies from a short-term perspective each time a foreign minister or the administration changes, such changes could damage national interests, and Japan could lose international trust':

'It is vital for Japan to make positive approaches to countries concerned so that it will not be buried in undesirable environments amid the changing of the world order' [5].



Controversial Soviet-era Kuznetsov-class aircraft carrier (renamed PLAN LIAONING (16)), alongside a Russian Typhoon Class Submarine.

is gaining the upper hand in what Zachary Keck expertly sums up as 'Asia's dangerous submarine race'.^[9]

'The traditional mentality that land outweighs sea must be abandoned, and great importance has to be attached to managing the seas and oceans and protecting maritime rights and interests.'

In May, China, in an official document, made available in English translation, expounded its new, more assertive military strategy – which relies heavily on expanding its naval strength. It describes its new strategy thus: To pursue this objective, Beijing has committed itself 'to seize the strategic initiative in military struggle, pro-actively plan for military struggle in all directions and domains, concentrate superior forces, and make integrated use of all operational means and methods.'^[10]

Far more than Australia's national interest is at stake. Freedom of the

Any power that conspires to bypass shared principles of international maritime law in order to commandeer control of the seas for its own exclusive advantage is a power against which we should be prepared to defend ourselves. But, without a sufficient and carefully planned defence capability, Australia will be unable to contribute towards the broader international good, let alone secure our sovereign interests in free trade and commerce.

Secretary of the Australian Defence Department Dennis Richardson has asked whether 'Australia's projected level of defence spending will be adequate for the challenges Australia is expected to face'. He further warned:

'The changes in East Asia, both economic and strategic, will see a real growth in regional defence expenditure. This will not be directed



Virginia-class attack submarine USN MINNESOTA (SSN-783) under construction in 2012 (US Navy Photo).

seas, upheld successively by the Pax Britannica and Pax Americana, is a priceless bequest of past generations who have sacrificed so much to uphold it. Australia too must value it and be tenacious in defending it. This year, the free countries of the English-speaking world have been celebrating the 800th anniversary of the signing of the Great Charter, or 'Magna Carta', which has been a cornerstone of the principles of limited government, the rule of law and individual rights, which have contributed so much to Western civilisation. The same tenets that underpin these principles have long informed the freedoms of navigation and the right to safe passage through the commons of our seas and oceans. The seas are implicit in the vast trade developments that have led to a major shift in the balance of economic power from West to East.

against us, but it will mean that the capability gap Australia has traditionally enjoyed in the wider region will significantly diminish and, in some instances, probably disappear. This raises questions as to whether Australia will be able to continue to meet our defence needs with around 2 per cent of GDP.'^[11]

TRIAGE

'Triage', a process employed in hospital emergency departments to determine which patients need immediate medical treatment, can be usefully applied in the context of national defence to indicate how Australia should plan and prioritise its defence spending.



The lead ship of India's nuclear-powered ballistic missile submarines, INS ARIHANT (S73)- during sea trials (source WPNFCC#4).

On the funding side, defence should no longer be the Cinderella of government departments and kept on short rations. Neal James (Australia Defence Association) has argued: 'Paying due attention to Australia's future strategic security means sustained investment is needed over the long-term and this is not somehow discretionary. Moreover, under-investment in defence infrastructure is causing intergenerational inequity. Not paying our fair share now, means inevitable high catch-up costs for future taxpayers to repair our neglect' [12].

The Defence Minister, Kevin Andrews, declared in April this year that the Abbott Coalition government is 'committed to return the defence budget to two per cent of GDP within the next decade to provide a stable and sustainable funding growth path' [13]. It is certainly laudable that the government should pledge to lift defence spending from its previously low level and ensure it doesn't fall as a proportion of GDP. But merely picking a spending target in this manner is not the best starting point for defence planning.

Former Defence Department official, Paddy Gourley, has cautioned about the dangers of government plucking a figure, such as two per cent, out of thin air. He says this 'moves the burden of defence policy from a careful, detailed analysis of strategic threats and risks to spending a pre-determined bucket of money on equipment and personnel that may

or may not be warranted'. Defence spending, Gourley maintains, should be based on 'real needs, not the arbitrary and ill-informed nomination of a proportion of GDP' [14].

Former RAND corporation executive, Edward W. Merrow, with experience in evaluating and planning large and complex megaprojects, such as dams, drilling platforms and chemical plants identified [15], among the underlying factors contributing to cost blow-outs and long unforeseen delays, such things:

- as lack of accountability;
- poor teamwork;
- an excessive focus on the short-term, and;
- a reluctance to utilise the best available technical expertise.

The Navy League is also aware of a survey conducted two years ago of Australian Infrastructure by the independent business management consultants, Caravel. It found that almost half Australia's megaprojects failed to meet their forecast costs, completion deadlines and standards of quality, stating:

'It appears that the delivery of Project Governance in Australia is generally highly dysfunctional' [16].

In Part II of this article, procurement and setting realistic strategy setting based on triaging the national interest will be examined. ■

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THE DEVELOPMENT OF THE INVINCIBLE CLASS LIGHT CARRIERS

CDR David Hobbs MBE, RN (Rtd)

The Invincible class carriers were without doubt a success story for the RN after the loss of their big fleet carriers. They not only carried the load for 30 years, including actual combat operations, but proved their worth, and more importantly the worth of much larger carriers which would be needed to fill their shoes. World renowned naval aviation writer David Hobbs explains this unique class of ship for *THE NAVY*.

In June 1966, not long after the cancellation of the CVA-01 aircraft carrier project, a prototype P 1127 'jump-jet' was embarked in BULWARK (R08) for two days of trials which demonstrated that STOVL fighters could be integrated very successfully with assault helicopter operations. Her commanding officer, Captain D B Law MBE DSC RN, proposed that future commando carriers should operate with a mixed complement of Wessex helicopters and P 1127 V/STOL fighters because, after 15 months in command of BULWARK, he believed that these ships had the capacity for fixed-wing aircraft to be embarked without reducing the ability to land and support a Commando group. Indeed their ability to provide close air support offered a considerable enhancement. His report stated that 'following the most encouraging results of this trial, the proposal ...to equip a commando ship with a mixed V/STOL and rotary-wing force merits early consideration'. While he was thinking primarily in terms of support for an amphibious force, the aircraft could also have performed a

number of other roles including surface search and strike. Unfortunately his recommendation achieved nothing because politicians thought the idea was a 'back door' way of keeping carriers and the naval staff was too traumatised by recent events to begin another fight with the MOD and Government.

In 1969, however, the P 1127-derived Harrier GR-1 entered service with the RAF; Hawker Siddeley was enthusiastic about producing a naval derivative and the RN Future Fleet Working Party took note of the possibility of embarking STOVL fighters in the range of 'cruiser' design studies they had set in train. A 'cruiser' with a large flight deck seemed to be the best option and work began on sketch designs described by the Defence Secretary Dennis Healey as having 'a number of capabilities which are essential if the shape of the fleet, based mainly on relatively lightly-armed frigates, is to be credible in the 1970s'.

The MOD Ship Department employed eight constructors and three naval

March 1963, P1127 derived Harrier landing on the deck of HMS ARK ROYAL No. 4 (R09).





HM Ships ARK ROYAL (R07), INVINCIBLE (R05) and ILLUSTRIOUS (R06) in Line Abreast, early 1980s prior to 12 degree ski ramp being incorporated into INVINCIBLE.

engineers assisted by up to 100 staff, 90 of whom worked on the design for over four years together with 360 staff at Vickers Shipbuilding and Engineering at Barrow-in-Furness who carried out the detailed design work as the designated lead yard for construction. Between them they produced more than 52 different sketch design which ranged from about 8,300 tons with a single-spot flight deck at the stern and a 'shed' for four helicopters with no gun or missile armament costing about £20 million to about 18,750 tons, a hangar for nine Sea Kings or P 1127s under the flight deck armed with Sea Dart and torpedo-tubes costing about £36 million. The design that was finally accepted for development was for a 19,500 ton ship with a narrow runway or 'through deck' just big enough to allow take-off by STOVL fighters and a long island set unnecessarily far inboard from the starboard deck edge to provide stowage for boats. Surprisingly, considering some of the earlier 'cruiser' designs had continued the full width flight deck right forward over the bow like an aircraft carrier, the design had an open forecastle that was of little use to anyone, aft of which there was a Sea Dart launcher surrounded by a protective 'zareba'.

The possibility of operating a navalised version of the Harrier was always a primary feature of this particular design and a briefing given to the Ship Department in April 1968 by the Controller, Admiral Sir Horace Law, envisaged a ship with a carrier-style flight deck capable of operating an air group of five P 1127s, nine anti-submarine Sea Kings and three AEW Sea Kings. The fighters required a very much larger infrastructure in terms of workshops, control, carrier-controlled approach and the sheer number and variety of weapons they could carry and the *Invincible* design was the smallest that could operate a tactically viable number of naval P 1127s, soon to be named the Sea Harrier, to give a layered fleet air defence system, strike potential against both ships and land targets and a reconnaissance capability. The naval staff insisted that only a fighter could shoot down shadowing aircraft or enemy missile-carrying aircraft that sat just outside the range of surface-to-air guided-missiles and this was agreed by the MOD which also accepted, at last, the fact that a small number of embarked fighters could maintain CAP over a task force far more economically and effectively than a larger number of fighters operating from a remote base relying on air-refuelling tanker support to reach and return from their CAP stations over the

fleet. Surprisingly, however, a perceived lack of hangar space and accommodation eventually led to airborne early warning being deleted from the staff requirement. Bitter experience in the South Atlantic War of 1982 would show just how flawed this decision was.

They were complex ships that needed a large internal volume but, for political reasons, they were limited to 20,000 tons. The result was a ship about the size of HMAS MELBOURNE but with a structure of unusual lightness to enclose a larger internal volume that resulted from a determined policy of using lightweight structure and equipment. The weight of steel used in the ship's construction was calculated at 10,000 tons, 50% of the displacement, but it amounted to only 15% of the costed man-hours. Had the maximum tonnage ceiling been relaxed slightly to allow a flight deck about the same size as that of HERMES on a ship with the same outfit

of command, control and communications equipment, a modest increase in steel weight would not have led to an increase of more than a few percentage points in terms of costed man hour but would have offered a dramatic improvement in the ability to operate aircraft. After a lot of debate about the choice of propulsion system between advocates of advanced steam units derived from the CVA-01 design, diesel electric options and gas turbines, Olympus gas turbines were selected because they offered commonality with contemporary destroyer and frigate designs and had the lowest requirement for manpower. On the other hand, they needed intakes and exhausts with five times the cross-sectional area required for steam machinery and the resultant trunking and individual lifts for each of the four gas turbines led to the hangar having a narrow, dumb-bell shaped centre section which limited the number of aircraft that could be struck down significantly below that of HERMES.

The hangar was 20 feet high to allow plenty of height for the as-yet unknown helicopter that was expected to replace the Sea King by 1985, one of a combination of design drivers which gave the *Invincible* class the highest freeboard of any ship in the RN. This fact and the design's modest displacement and innovative hull structure caused a number of problems, not least the need to retrofit larger anchors to counteract its significant windage. The four Rolls Royce Olympus TM 3B gas turbines were capable of delivering a continuous 94,000 shp through gearboxes and two shafts. At 47,000 shp on each shaft this was more than any previous British warship; the equivalent shp-per-shaft figure for the 1955 ARK ROYAL was 38,000; VICTORIOUS 36,000; the battleship VANGUARD 32,000; the battlecruiser HOOD 36,000 and the cruiser BELFAST 20,000. All of them

HMS ILLUSTRIOUS (R06) in her Final Role as an Amphibious Landing Platform Helicopter (LPH) off the Coast of Norway





HMS INVINCIBLE (R05), with a 12 degree Ski Ramp added, and HMS ARK ROYAL (R07), Passing in the Day

led to distinctly limited magazine spaces, less than half the size of those in the volumetrically-similar HERMES. Under peacetime conditions they were expected to spend about half of their time at sea and to have a hull life of between 20 and 25 years. ILLUSTRIOUS, last of the three, was decommissioned in 2014 after 32 years in service.

A myth subsequently grew that the incorporation of Sea Harriers into the design was an afterthought that caused problems during the build. This is completely untrue. As early as 1971 the naval staff sought clarification of the cost of incorporating STOVL fighter facilities and the Ship Department estimated the total cost per ship at £44.2 million, within which £1.5 million was included for procuring fixed-wing facilities and a further £0.75 for fitting them. The naval staff requirement for a 'maritime V/STOL aircraft' based on the Harrier GR 1 in RAF service was accepted by the MOD and issued in 1972. Development work by Hawker Siddeley was authorised immediately, a year before the first ship was laid down and a production contract for the first batch of aircraft was placed in 1975, five years before the first ship was completed. The Sea Harrier requirement specifically stated that interim decisions had been agreed to allow further specific work on *Invincible's* design to be funded. Surprisingly, in view of the fact that the type was already in service with the RN, most difficulty was encountered absorbing the latest version of the Sea King, the HAS 5, which had evolved after the *Invincible* design was frozen. It was designed to carry, dispense and monitor sono-buoys as well as dipping sonar and this meant that INVINCIBLE had to be modified to provide both bulk and ready-use stowage for sono-buoys and a convenient route through which they could be moved to aircraft while the ship was at action stations. It proved possible to create deep stowage for 1,200 in the first ship with a further 300 for ready use at hangar level. A bulk facility for 2,000 was designed into the less advanced second and third ships. Another alteration made necessary by the Sea King HAS 5 was the need to incorporate a

had much stronger, armoured hulls and it is easy to see why INVINCIBLE's lightweight hull suffered badly from vibration. The third ship had to have 500 tons of steel added to cure the problem, a modification incorporated in the first two ships during refit. The preparation of production drawings was hastened by 'freezing' the design in the early 1970s. It had originally been intended that Vickers Shipbuilding and Engineering would build all three ships at its Barrow-in-Furness shipyard to provide the maximum economy of scale but the Labour Government that returned to power in 1974 decided that the second and third ships should be built by Swan Hunter on the Tyne to provide employment in a depressed area, a move that cost the MOD much more than a modest increase in flight deck size would have done.

The staff requirement for these ships read more like a defence review and stated that the ships were to command a task force and control the operation of land-based aircraft; act as Force ASW commander of a NATO Task Group; operate large ASW helicopters for area ASW defence; deploy area surface-to-air guided weapons; deploy a surface reconnaissance capability and, last of all, deploy a quick-reaction contribution to limited air defence, probe and strike capability with V/STOL aircraft. The embarked task force commander was expected to respond with force 'only when specifically directed' which implied that the MOD expected to exercise tight political control over activities in a confrontation with the Soviet Bloc. Further, it 'envisaged that non-firing operations may last for up to three months, during most of which maritime contingency forces might be constituted'. If escalation continued, 'firing operations might last a further month, the last week of which would see widespread operations at an intensive level'. This tightly-specified concentration on the period of transition leading to war rather than actually carrying out combat operations implied that the MOD was, by then, only thinking in terms of a confrontation between the Soviet Bloc and NATO. This myopic view



HMS ILLUSTRIOUS (R 06), and Nimitz-class aircraft carriers USS HARRY S. TRUMAN (CVN 75) and USS DWIGHT D. EISENHOWER (CVN 69) – Thinking Big!

HMS ILLUSTRIOUS (R06) and USS McFAUL (DDG 74), an Arleigh Burke class destroyer



helicopter acoustic analysis unit to enable the post-flight de-brief and analysis of passive sonar information that had been recorded on the Sea King's 'black box' during a sortie. It was of considerable operational importance and under-pinned the Sea King HAS 5's relevance as a force ASW asset. At some difficulty and cost an interim unit was eventually provided in INVINCIBLE and more refined versions in the later ships.

The most significant change to the original 'through-deck' design, however, was the ski-jump. Like the steam catapult, angled deck and mirror landing aid before it, the ski-jump was the 'brain-child' of a serving naval officer, in this case Lieutenant Commander D R Taylor RN who had been carrying out a period of study at Southampton University for the award of an M Phil. The original Invincible design had envisaged launching fighters from the conventional, flat deck 450 feet long, angled one degree to port of the ship's centreline so that aircraft would clear the protective 'zareba' around the Sea Dart launcher. By the forward edge of the flight deck a Sea Harrier would, typically, have accelerated to about 90 knots and with a wind over the deck of 20 knots this gave a combined speed of 110 knots 'felt' by the aircraft. This was still below the wing's stalling speed and so when he reached the bow the pilot selected the nozzles down to about 50 degrees relative to the fuselage and raised the nose slightly to give optimal wing incidence. A significant proportion of aircraft weight would, thus, be borne by engine thrust but a component of that thrust was still directed aft and would continue to accelerate the aircraft until the wing's stalling speed was exceeded and the pilot could rotate the nozzles fully aft and fly the aircraft like a normal fighter. This technique was practised in HERMES from 1977 onwards using Harrier development aircraft and prototype Sea Harriers flown by test pilots. The Sea Harrier had insufficient engine thrust to allow it to take off vertically with full fuel and weapons but a short take-off run allowed the aircraft to launch from a flat deck at weights 30% heavier than that at which vertical take-off would have been possible. The Sea Harrier was particularly well suited to this form of launch since it had to hover before a vertical landing and was, therefore, fitted with a system of flying controls that worked when the wing was not giving lift and there were minimal forces acting on the tailplane and rudder. When the aircraft was in wing-borne flight, it used conventional elevators, ailerons and rudder. When the engine exhaust nozzles were rotated below 10 degrees these surfaces continued to move but, additionally, a series of 'puffer jets',

fed by high-pressure air ducted from the engine, came into operation to give the pilot continued control with his stick and rudder pedals. A flat deck launch left the aircraft low and slow close to the surface of the sea for up to 15 seconds, however, and at night or in bad weather this was clearly not ideal. Any sort of malfunction or distraction would leave the pilot very little time to eject. Another drawback was that Sea Harriers could not achieve their full load-carrying potential from the short deck run available in INVINCIBLE.

Taylor examined several alternative ways of launching V/STOL aircraft but the most elegant proposal was for a curved ramp or 'ski-jump' at the forward end of the flight deck which allowed the aircraft to leave the deck after nozzle rotation at the apex of the curve at a speed which could be

significantly less than that needed for a flat-deck take-off. This effect could be translated into a much shorter deck run or higher launch weight. A 20 degree ski-jump offered a launch speed reduction of 30 knots at a given aircraft weight and at the highest aircraft weights associated with strike missions this represented a reduction of about half in the deck run required. At the lower weights associated with fighter missions a deck run of only about one third of that needed for a flat deck launch was required. Alternatively, from longer deck runs, aircraft could carry up to 2,000lb more payload. The advantages of the 'ski-jump' were immediately apparent and work was put in hand to evaluate its installation on INVINCIBLE, despite the 'frozen' design. The result was positive but cautious; the value of installation was agreed to justify the extra cost of drawings and modification during build but the ability to operate Sea Harriers had not been given the highest priority in the staff requirement for the ships and there were concerns that a 'ski-jump' would significantly limit the adjacent Sea Dart mounting's arcs of fire. It was eventually agreed that a small 7 degree 'ski-jump' would be fitted, a compromise between improved Sea Harrier performance and surface-to-air guided weapon capability. The section responsible for HERMES was not constrained by a Sea Dart installation and saw the improved operation of aircraft as their priority so they opted for a larger 12 degree structure which was installed during the ship's 1980 conversion in Portsmouth. This was to prove far more effective and was copied on the third ship of the Invincible class, ARK ROYAL. The first two ships were subsequently modified with 12 degree 'ski-jumps' during refits. The Sea Dart system was eventually removed to allow more magazine and parking space for fighters; it had

A Sad Metaphor? HMS INVINCIBLE (R05) towed to her final destination, a Turkish scrapyard, Spring 2011



never proved a useful asset, even in the Falklands War. When INVINCIBLE joined the fleet in 1980, she became an operational unit rather than a theoretical design study. The difference in perspective manifested itself in a number of ways, most significantly in making a re-appraisal of the manpower required to operate the ships effectively. The original scheme of complement specified a ship's company of 926, comprising 114 officers, 239 senior sailors and 573 junior rates based on its role as a flagship with an air group of five Sea Harriers and nine Sea Kings. The ship's company for the second and third ships, based on the same assumptions, rose to a total of 965 comprising 120 officers, 248 senior sailors and 597 junior rates. Accommodation was designed to high standards with all officers and a proportion of senior sailors in single cabins and separate bunk and recreation spaces for the remainder. By 1997, however, the scheme of complement for the class had risen to 1,250 comprising 201 officers, 307 senior sailors and 742 junior rates since, by then, the air group had grown to six Sea Harrier F/A 2, nine Sea King HAS 6 and three Sea King AEW 2. There were, however, only 1,249 bunks available (the sailor without a bunk was a junior rate), an unprecedented 26% increase which showed how unrealistic the original scheme had been. Surprisingly, the flag and command arrangements also had to be expanded before they could be considered good. Fortunately the initial accommodation design proved adaptable and when the first ship arrived in Portsmouth a second bunk was built into most junior officers' cabins but later, more radical solutions were incorporated to house the extra men required for the Sea King AEW squadron. It had been found that if Sea Kings were parked in the after hangar nose aft, there was room for a mezzanine space to be built above them to contain four and six berth officers' cabins and this modification was eventually applied to

all three ships. Many of the ship's air arrangements needed practical improvement before the ship became operational but, despite a number of shortcomings, all of which were eventually set right in modification refits, the important fact was that the RN had all three ships of the Invincible class. They were able to absorb considerable changes that had not even been considered during their design process and function as light fleet carriers, deserving their NATO designation as CVS.

In 1979 a new UK Government under Margaret Thatcher was elected and began a number of studies to aimed at cutting expenditure to 'balance the books'. A defence review was completed in 1981 in which the Defence Secretary, John Knott, who had no personal understanding of detail, allowed himself to be persuaded that land-based aircraft could meet the reduced requirements of a fleet that was to be composed largely of nuclear submarines and a few frigates. It was, therefore, announced in February 1981 that INVINCIBLE had been sold to the Royal Australian Navy at a reported bargain price of £175 million, less than her estimated final build cost. The RAN was seeking a small carrier to replace MELBOURNE but had dismissed the Invincible design as too expensive and complicated but could not now resist the low 'sale price'. The RAN already operated Sea Kings and had two pilots flying Sea Harriers with the RN so they, too, were an option. In service she would have been re-named AUSTRALIA and would have undergone a number of changes, not least the removal of Sea Dart. After the South Atlantic War of 1982, however, the Australian Government said that it would not hold the UK Government to the deal in the changed circumstances if it wished to change its mind. Not wanting to face the adverse publicity the sale would by then have created in the British press, the UK Government decided not to proceed with the sale and the RAN lost its opportunity. ■

Fonder Memories – HMS INVINCIBLE (R05) returning home from the Falklands War, Summer 1982





01 RSN MAINTAINS LEAD: INDEPENDENCE-CLASS LITTORAL MISSION VESSEL

The RSN launched its first-of-eight Independence class LMVs, 3 July 2015, to replace its eleven Fearless-class (force projection) patrol vessels. The ship takes forward a number of new concepts, including the combination of an integrated command centre (ICC) which synergises the three operation information rooms: navigation, engineering and combat weapons. Jointly designed by Saab Kockums AB and ST Marine, it is being built in Singapore by ST Marine under the project management and systems integration of Singapore's Defence Science and Technology Agency (DSTA). A potential post First-Principals Review role for DSTO / DSTG? Fitted with one Oto Melara 76 mm main gun, two Oto Melara Hitrole 12.7 mm remote-controlled weapon stations (one each on the port and starboard sides), and a stern-facing Rafael 25 mm Typhoon gun system. ASM is provided by MBDA's VL Mica anti-air missile system deployed via a 12-cell vertical launching system in the forward section.

The LMV can embark a medium-lift helicopter on its flight deck. Significantly, taking forward the concept of rigid hull inflatable boats (RHIBs) as an integrated weapon system, the LMV contains a launch-and-recovery system (from Norwegian Deck Machinery) that accommodates at the stern two or the Protector unmanned surface vessel (USV). Stern launching has significant handling and safety advantages to launches and recovery alongside. Designed around Versatile Modular System (VMS) concepts configured to deploy a range of containerised mission packages such as a medical module for humanitarian assistance and disaster relief (HADR) operations and unmanned systems for surveillance and mine countermeasures (MCM) operations.

AUSTAL DELIVERS SEVENTH CAPE-CLASS PATROL VESSEL

Austal Limited has delivered the seventh Cape-class offshore patrol boat to the Australian Border Force (ABF) – to replace the Bay-class patrol boats in service since 1999. The CAPE WESSEL, is one of an AUD330 million contract awarded in August 2011 to design, build, and provide in-service support for eight Cape-class vessels. The class has a length of 57.8 m, a beam of 10.3 m, and a draught of 3 m., with a top speed of 25 kts and a range of 4,000 n miles (at 12 kts). It can accommodate a crew of 18. Its primary force system is two rigid hull inflatable boats, which it recovers and launches alongside, from the stern.

02 LANDING CRAFT GIFT TO THE PHILIPPINES BY RAN

Chief of Navy Vice Admiral Tim Barrett, AO, CSC, RAN, accompanied by his Philippine counterpart, Flag Officer in Command Philippine Navy, Vice Admiral Jesus Millan, gifted two decommissioned Australian Balikpapan class landing craft to the Government of the Philippines: 'to assist the Philippines defence modernisation program and improve the Philippine Navy's ability to respond to future natural disasters'. The decommissioned vessels, ex-HMA Ships TARAKAN and BRUNEI, were re commissioned at the ceremony, into the Republic of Philippines Navy as BRP IVATAN (AT298) and BRP BATAK (AT299).

RAN PORT-VISIT TO FIJI

The first Royal Australian Navy ship to visit Fiji since 2006 has completed a six-day port visit to Suva.

Commanding Officer HMAS LEEUWIN, Lieutenant Commander Richard Mortimer says his ship's company of 65 have been working alongside the Defence Forces of Fiji.

LEEUWIN is currently deployed on a three month

south-west Pacific deployment. The ship also participated in a tri-lateral Western & Central Pacific Fisheries Commission patrol with New Zealand and France: to detect and deter illegal, unreported and unregulated fishing operators undermining migratory fish stocks in the region.

ROYAL THAI NAVY PLANS TO BUY CHINESE YUAN-CLASS SUBMARINES

The Royal Thai Navy (RTN) has selected China's Yuan-class (Type 041) platform to meet a requirement for three submarines, to take delivery of the first S26T 2021. The US\$1 billion programme is based on a government-to-government vehicle. It will reinforce Thailand's tilt towards China over the next decade.

TAIWAN CONCEDES ASW HELICOPTER REQUIREMENT

Taiwan's Ministry of National Defense conceded a bid to purchase up to 10 Sikorsky MH-60R Seahawk anti-submarine warfare helicopters from the United States. According to ministry spokesman Major General Luo Shou-he, while 'Taiwan is looking to replace its ageing fleet of MD 500 (Defender helicopters), the Republic of China Navy is still considering what next-generation anti-submarine helicopters meet its requirements... the MH-60R is not the only option being considered'.

PAVN KILO SUBMARINE ARRIVES AT CAM RANH BAY: TT400TP-CLASS PATROL BOAT TO SOUTHERN COMMAND

The People's Army of Vietnam Navy (PAVN) commissioned its third and fourth Russian-built Project 636 Kilo-class diesel-electric submarines (SSKs), according to local media.

The vessels, HAI PHONG (HQ 184) and KHANH HOA (HQ 185), were commissioned on 1 August at Cam Ranh Bay Naval Base. They join two other vessels

01 RSN Independence - class stern launch for RHIBs.



in the class, HANOI (HQ 182) and HO CHI MINH CITY (HQ 183), which were inducted in January and April 2014 respectively.

Vietnamese Kilos are equipped with six 533 mm tubes deploying TEST-71 series anti-surface and anti-submarine heavyweight torpedoes and can each carry up to 18 torpedoes or 24 torpedo tube-deployed naval mines. It is powered by two 2.68 MW diesel-electric engines with a top speeds of 17 kts submerged and 9 kts snorting. It has a range of 400nm submerged and 6,000 nm snorting.

The improved Project 636 Kilo-class diesel-electric submarine, DA NANG earlier arrived in Cam Ranh Bay. It is also part of the US\$ 2 billion contract for six SSKs signed between Vietnam and Russia's Admiralty Shipyards in 2009 for final delivery in 2016. In addition to the six Kilo-class submarines, Vietnam has bought accompanying Klub Russian-made missiles. Klub missiles can attack land and could potentially reach coastal cities in China – so representing an element of Vietnam's emerging forward deterrence posture.

It is understood that Cam Ranh Bay Naval Base is being developed into a dedicated submarine facility that will pen all six boats.

In other news, the Vietnamese Coast Guard has commissioned a 54 m patrol vessel into the service's 'Zone 4' command. Based in Phu Quoc, the Coast Guard has responsibility for overseeing Vietnam's southern territorial waters. The TT400TP class top speed is 32 kts; range of 2,500 nm at 15 kts.

Vietnam is placed between the dragon and the bear – it last fought China in 1979 and, since its split with Beijing during the Vietnam War, has continued to rely on Russian weaponry, assistance and advice.

03 RUSSIAN BUYAN-M CLASS GET KOMAR SAM

Russia's Buyan-M (Project 21631) corvettes are to be armed with the Komar turret mount, equipped

with 9M38/9M313/9M342 surface-to-air missiles using the Igla-series of man-portable air defence systems (MANPADS). Armed with one-channel missiles, equipped with passive optical searching seekers, and a selector for false thermal noises.

04 ZUBR-LCAC AMPHIBIOUS OPERATIONS IN SOUTH CHINA SEA

A new Zubr-class (Ukrainian design / Chinese built) landing craft air cushion (LCAC) was trialed in a PLAN July amphibious landing drill. The LCAC was transported to the region by one of China's Heavy-Lift Mobile semi-Submersible Platforms (MSP), the DONGHAIDAO (868), and simply driven off once submerged. The LCAC is capable of carrying three PLA Type 99 main battle tanks (MBT): it has a top speed of 60 kts and a range of 300nm at 55 kts. The MSP (based upon 2008/9 UK VMS concepts) represents a significant expansion of China's dual-use, civil-military application of maritime capability.

CHINA TO RETROFIT 172,000 MERCHANT SHIPS FOR MILITARY PURPOSES

In an ambitious move combining aspects of dual use and versatile modular system designs, Chinese civilian shipbuilders have been ordered to ensure that their vessels can be used by PLAN during times of 'crisis'. In many respects this was similar to NATO Ship design requirements, applied also to Australian Merchant Shipping, up and until the mid-1980s – in the event of war with the Soviet Union and the re-supply of Western Europe (from the US / Canada). The recent announcement is a sign of the growing aspirations of Chinese naval planners in developing asymmetric naval expeditionary warfare capabilities. Apparently, the China Classification Society, reported Beijing has approved a number of technical guidelines to be adopted by commercial and civilian shipbuilders that will ensure vessels will

be able to transform for use by the military in the event of an emergency specifically for: container; roll-on/roll-off; multipurpose; bulk carrier and break bulk. The China Classification Society stated that designs would:

'enable China to convert the considerable potential of its civilian fleet into military strength'

There are a number of concerning trends with regard to the degree of political, centralised controlled being exercised by Beijing on its military. There is reportedly an outbreak of 'Peace Disease' amongst Chinese military leadership, fearful of civil-political constraints and ambitious – it would seem – for conflict. Combined with a state that is increasingly acting outside national conventions and norms, such as UNCLOS; the militarisation of trade and commerce; recent 'liberal interpretations' of what its national security entails in the South China Seas; plus rogue military elements, could create an uncontrolled / uncontrollable set of events. Even more so when such disguised (shadow or ghost)-Fleet capabilities could confer a surprise attack capability on a protagonist. Worryingly, such an attack could also come as a surprise to Beijing!

SOUTH CHINA SEAS: THREAT TO SHOOT RAAF PLANES

A China state media spokesperson commenting earlier in the year on the dispute in the South China Sea apparently said if Royal Australian Air Force aircraft conducted reconnaissance flights over the disputed areas they should be shot down. Separately, the then Prime Minister Tony Abbott deplored attempts by any nation to expand its territory in the disputed region; stating Australia would 'do whatever we can to uphold freedom of navigation on the sea and in the air'.

02 The decommissioning guard from HMA Ships TARAKAN, Labuan and BRUNEI stand at ease.





TOO LATE FOR UNCLOS?

In July, the Arbitral Tribunal at The Hague began its hearing on the case submitted by the Philippines against China regarding its South China Sea claims. The case attempts to address the South China Sea disputes through the rule of law rather than the use of illiberal force. It is therefore also a test case for the upholding of International Law and Order and the 1941 Atlantic Charter that gave rise to the UN. Chinese expansion has continued despite repeated protests that it violates the United Nations Convention on the Law of the Sea (UNCLOS) and agreements like the 2002 Declaration on the Conduct of Parties. Consequently, as Philippine Foreign Secretary Alberto del Rosario, stated: the court's decision has global significance because of its 'impact on the application of the rule of law in maritime disputes'. Malaysia, Indonesia, Vietnam, Thailand and Japan are directly observing the proceedings after being permitted to do so by the court. If the court rules in Manila's favour, it may cause China to significantly reinforce its so called 'nine-dash line'. This would have significant implications for other actors, including Australia, the US and Japan, noting wider tensions regarding freedom of navigation and overflight.

The United States has accused China of unilaterally and coercively pursuing territory in the South China Sea, comparing its policy to that of Russia in eastern Ukraine.

China has declined to participate in the case; while continuing to broaden its claims in the South China Sea, and pushing ahead with the construction of artificial islands. In this regard, the US position may also be destabilising since, although it recognises UNCLOS as a codification of customary international law, it has not ratified it. Moreover, since China is a permanent member of the UN Security Council, it will simply veto any recommendations arising – as did Russia over the proposed tribunal into the

shooting down of MH17.

Failure to uphold the law in this case may act entirely to further unwind the rule of international law and order, designed precisely to avoid descent into state-on-state war. In this respect, Chinese actions look worryingly like Anschluss. Failure to adequately adjudicate and / or to then implement tribunal findings may lead to further escalation and counter-counter tactics as parties develop their own strategies to preserve claims. For the US, this will place yet greater emphasis on building coalitions to emphasise the rule of law in the South China Sea. This will inevitably place Australia in the uncomfortable position of having to choose between its traditional and long standing allies (the US and Japan) and its primary economic partner. The worrying thought is that:

A loose shot in the South China Sea may echo round the world.

SOUTHEAST ASIA PACIFIC MARITIME PATROLS

Patrols by SEA littoral states have been credited with containing piracy (including people smuggling) and armed robbery in the Straits of Malacca and Singapore. Potentially, this might provide a basis for expanding such sea patrols to include: HADR; an ASEAN-led maritime force in the South China Sea, as mooted by Vice Admiral Robert Thomas, Commander of the US Seventh Fleet; the broadening of the (2004) Malacca Strait Patrols (MSP) counter-piracy initiative, to include Myanmar; Piracy patrols east of Singapore (Singapore has been exploring coordinated patrols east of the Singapore Strait including the nearby reaches of the South China Sea in response to attacks on shipping in the waters north of Indonesia's Bintan island); illegal foreign fishing (in conjunction with Australia and Indonesia); and a counter-piracy arrangement to cover the south-western South China Seas. These

more pacific and inclusive responses, in accordance with UNCLOS, may assist in de-escalating tensions in the region.

CHINA SEAS MARITIME BUILD-UP ACCELERATES

Southeast Asian nations are prioritising spending on their navies and coastguards amid rising tensions in the South China Sea. Annual defence spending in Southeast Asia is projected to reach \$52 billion by 2020, from an expected \$42 billion in 2015.

The East and South China Seas, from the southern tip of the Korean peninsula to the Indonesian archipelago, have formed the backbone of economic and cultural exchange, migrations and trade over the millennia in a similar way to the Mediterranean.

CHINA'S GREAT SAND AND CYBER-WALL STRATEGY

The May 8 report to US Congress on Chinese military capabilities outlined Beijing's systematic build-up of anti-space systems. This is a relatively minor part of the Cyber capability China and Russia are developing. Over 95% of all international cyber-internet traffic is via hi-speed maritime submarine cables. The South China Seas (China's emerging Great Sand-wall) also represent the critical 'cyber-switch' for all Pacific and Asian knowledge enterprise economies (KEEs). The South China Seas include, specifically, the cyber choke-points (CCPs) of Singapore, Shanghai and Hong Kong – routing through the Malacca Straits, Hokkaido, Honshu, California, Vancouver, Bombay, and the Straits of Hormuz. Australia is reliant on all these switches and hi-speed cables for its Cyber traffic! The hope is that the forces for greater global economic integration outweigh those for building the Great Sand and Fire-walls. But hope is not a plan.

03 HMAS CANBERRA (L02) alongside US Seventh Fleet Flagship USS BLUE RIDGE (LCC 19), arriving in Sydney for the U.S.- Australian biennial military exercise Talisman Saber 2015.



RUSSIA AND CHINA 2016 SOUTH CHINA SEA DRILLS

Russia and China are in the advanced stages of planning for May 2016 naval drills in the South China Sea. Russian Deputy Defence Minister Anatoly Antonov suggested the United States as being the primary destabilizing factor in the South China Sea. He also accused the United States of interfering in the international affairs of other states. Noting the May 2015 Mediterranean exercises, Russia and China have been steadily increasing their bilateral maritime security cooperation, and the interoperability of their navies. Details remain sketchy but are thought to include HADR of China's reclaimed and constructed islands and reefs in the Spratly and Paracel Islands.

TALISMAN SABER 2015

30,000 personnel participated in Exercise Talisman Saber 15 including:

- RAN, USN and RNZN: 11,824
- Australia, New Zealand and US Army: 9,493
- USMC: 4,665
- Special Operations Forces: 1,345
- RAAF / USAF: 958
- Joint: 908
- Interagency: 9

This is the sixth Talisman Saber series of exercises – a major Australian and United States military training exercise focused on the planning and conduct of mid-intensity high end warfighting. This is the first time Exercise Talisman Saber has run simultaneously within the Shoalwater Bay Training Area, near Rockhampton in Central Queensland and at Fog Bay, south west of Darwin. The United States Army says Australia is one of its most important defence partners and it hopes to strengthen that relationship. Australian Army Brigadier Mick Ryan said the biennial event was an important show of the nations' combined military strength. This year's

Talisman Saber exercise was being led by the Australian Army 7th Brigade, which is expected to deploy to Iraq at the end of the year.

FRENCH NAVY VISIT TO CHINA

The DIXMUDE helicopter carrier and the frigate ACONIT visited the Shanghai, marking the first visit to China by French naval vessels since 2013. The vessels are part of a larger operation: 'Jeanne d'Arc 2015' – neatly coinciding, perhaps, with Waterloo 2015? – taking part in the Indian Ocean, the South China Sea and the Sea of Japan. A French Quai d'Orsay official commented: 'we come to the Pacific because a lot of economic interests are here...and because maritime traffic is mostly here in the Pacific. We want to protect it!'

MISTRAL EXPORT CANCELLATION

Russia and France have formally cancelled the troubled Mistral-class amphibious assault ships export contract – suspended since 2014 as a result of events in Ukraine.

The Kremlin and the Élysée issued joint statements on 5 August confirming the termination of the agreement, with both governments stating that the matter had been 'fully resolved'. France will return both funds (already paid by Russia) and Russian equipment that had been supplied for installation on the 21,000 tonne full load displacement landing helicopter dock vessels. The French government will take ownership of the two ships.

The 2011 contract USD1.3 billion was the first of its kind between a NATO member state and Russia. The first ship, VLADIVOSTOCK, left the STX France yard at Saint Nazaire October 2013 and had been scheduled for delivery October 2014. The second (SEVASTOPOL) was laid down in 2013 and scheduled for delivery in 2015.

France came under considerable pressure at the time of the deal (by US, UK, Germany and NATO)

since it was seen to be giving Russia a significant amphibious / littoral warfare technological transfer. The annexation of the Crimea in 2014 was the final nail in the coffin – but it is known that France is actively looking for new owners, potentially in the Far East. The Mistral, with obvious similarities to the LHDs, is considered to be a better build and fit than the Juan Carlos class.

USMC DECLARES F-35B OPERATIONAL

The USMC Lockheed Martin F-35B Lightning II combat aircraft reached initial operational capability (IOC) on 31 July with a squadron of 10 aircraft 'ready for world-wide deployment'. USMC Fighter Attack Squadron 121, based in Yuma, Arizona, is the first squadron in the world to become operational with an F-35 variant.

05 PM'S F-35 LPD PLAN SCUPPERED

In a move, apparently led by military and Defence officials / advisers, plans to equip HMAS CANBERRA and NUSHIP ADELAIDE with F-35 fighter jets may have been dropped ahead of the Defence White Paper. The proposal was part of considerations until earlier in the year and, apparently, will 'now not make the cut'.

The proposal would have brought Australia, strategically, into line with the USN and RN and a number of other nations that plan to operate F-35s from their assault ships. The F-35B version of the joint strike fighter is being built for the USMC and RN FAA to replace the Harrier – the proven weapon of choice (flown by RN FAA and USMC pilots) in Afghanistan. The Juan Carlos class – upon which the LHDs are based – is equipped to carry Harriers and has recently successfully embarked USMC V-22 Osprey.

In an apparent case of left-hand; right hand, defence advisers argued that that the purchase of aircraft

04

A new Zubr-class Ukrainian design and built landing craft air cushion being delivered to PLAN by Heavy Lift Ship, HHL New York.





and ship modifications would involve 'multibillions of dollars'; while later conceding the role of Amphibious warfare capability – and interoperating with the US. ASPI analysts Drs Richard Brabin-Smith and Benjamin Schreer suggested that 'the cost-benefit analysis is not in favour of developing [the assault ship-jump jet proposal] – ...the scenarios in which the capability would be realistically required and make an important impact are operationally vague at best'. They also indicated that the DWP 'should not announce a decision or intention to acquire jump jets for the ADF... there are likely better ways to spend the money'.

This may be a case of cost-capability driven strategy – the worst of all combinations. While it is important for Australia not to be seen as over-muscly in the region and potentially counterbalancing, the DWP should set the strategy – not the capabilities or lack thereof.

F-35B COMPLETES ORDNANCE APPROVAL TESTS

In June the USMC completed the first Lockheed Martin F-35B Lightning II operational ordnance expenditures tests. Fourteen USMC pilots flew six F-35Bs during the five-day exercise in Restricted Area 2507 in California. According to Chief Warrant Officer 2 Matthew Beard, 'we showed that we could employ the weapons that were supposed to be employed and that we have sound weapon employment systems at this point'.

Proving ordnance delivery is critical to the USMC declaring F-35B Initial Operating Capability (IOC).

RN AND UK DEFENCE FORCE FACE CONTRADICTIONARY FUTURES

Facing concerted criticism from former admirals, generals, and air force marshals and senior US government politicians, officials and Defense chiefs, UK Defence secretary Michael Fallon

defended the UK Government's military strategy and spending. The UK government is particularly stung by criticisms from the US. Head of the US army, General Raymond Odierno, and SecDef, Ash Carter, have publicly expressed concern about the impact of UK spending cuts in Britain's annual £34bn defence budget. Barack Obama is reported to have raised concern at the Cameron government's refusal to guarantee it will continue to devote 2% of the UK's GDP - the official NATO target. Fallon's response was that 'using smart power, our better-focused development budget, on conflict prevention and stabilisation as well as on disease and suffering'. He non-controversially stated that he could 'announce that we will commit a battle group of around 1,000 personnel to the new [Nato] rapid reaction force every year from its launch and into the next decade'. This was first revealed at Nato's summit in Wales, Sep 2014. The issue is not with the 2%, per se, but how the UK will deploy this funding, effectively and competently in the future. The more informed House of Lords Defence Debate heard from the former general and chief inspector of prisons, Lord Ramsbotham, who '[deplored] targets...[because] it is only sensible to base defence spending on what the defence of the realm requires'. He added 'without having a national security strategy on which an SDSR can be based you have no idea when you are going into these sums whether you have what is required'.

In sharp contrast, the Royal Navy's First Sea Lord, Admiral Sir George Zambellas claimed that 'the introduction of a wealth of new assets – including aircraft carriers, attack and ballistic-missile submarines, destroyers, frigates and offshore patrol vessel – would ensure the Royal Navy is more credible in the eyes of [its] most important partner than ever before'. US Chief of Naval Operations, Admiral Jonathan Greenert, having previously signed a USN / RN Combined Sea Power agreement, more sagely commented 'the value of

the relationship by far is greater than the sum of our forces. It's a very, very powerful symbol by the two leading democratic nations, and our forces represent freedom and liberty around the world... the U.K. will always be our committed ally, and the Royal Navy will be my vital partner and of those that come after me'.

Meanwhile, the number of RAF fighter planes is set to fall to its fewest number of fighter planes since 1918. UK Defence chiefs have already warned the RAF is stretched and the analysis says that further loss of UK airpower would seem 'perverse'. Commenting, the Chief of the Defence Staff (CDS), General Sir Nicholas Houghton, described the RAF as at the 'very limits of its fast jet availability'. Contradicting CDS's views, a MoD spokeswoman stated 'the RAF would remain capable of carrying out operations around the world'.

In July, UK Chancellor George Osborne pledged to meet NATO's target of spending 2% of national income on defence every year, up to 2020. He also announced that spending on defence was to rise in real terms - 0.5% above inflation - every year during this Parliament (to 2020).

The results of UK SDSR (2015) – with direct US involvement in the process – will be published in 2016. Citing collaborative deployments in the Baltic Sea and Persian Gulf, Michael Fallon told a Chatham House seminar that the relationship between the US Navy and the Royal Navy 'goes from strength to strength' – only more in London and Washington than the high seas, it would appear.

MORE DELAYS IN ZUMWALT DESTROYER PROGRAM

Delays in the construction of the first two of three next-generation Zumwalt-class (DDG-1000) guided missile destroyers at the General Dynamics Bath Iron Works shipyard have been partially to blame for slowing work on two Arleigh Burke (DDG-51)

05

HMAS CANBERRA (L02) and NUSHIP ADELAIDE (L01) alongside and docking down', Fleet Base East July 2015.



destroyers being built at the Maine yard, USNI News has learned.

While long-lead production work for the Zumwalts began at BIW, the yard won the contracts for the pair of Arleigh Burkes in 2011. The 16,000-ton Zumwalt-class and its ongoing delays are tied to its unique power scheme—the Navy's new integrated power system (IPS). Unlike the Burkes' direct mechanical connection to its props from its gas turbine engines, the Zumwalts' IPS creates a ship-wide power grid that powers the induction motors that propel the ship and all of the ship's other systems. Twin Rolls-Royce MT-30 gas turbines and two smaller Rolls-Royce RR450 gas turbines of the IPS provide a combined maximum of almost 80 megawatts. IPS is the Navy's most recent and best expression of an electric ship concept—removing direct mechanical connections from the ship's prime movers to its drive train.

The US Navy tried the concept in experimental U.S. nuclear attack submarines in the 1960s and 1970s, but shelved the effort because the output of contemporary electric motors did not propel the attack boats quickly enough.

An acquisition spokeswoman for US Navy stated: 'our current forecast, based on latest test program trends, is that ZUMWALT will commence Dock Trials in Nov 2015, in preparation for the ship's first underway trial period in December'.

LCS: RAPID ANTI-ACCESS DETECTION, PROCESSING, AVOIDANCE AND CLEARANCE (RADPAC):

With implications for RAN / DSTO/Gs own sea-breaking minehunting detection and processing systems / algorithms and despite years of development, constant effort and numerous official pronouncements of progress, the minehunting system at the heart of a new family of US Navy mine countermeasures gear shows no signs of

improvement and poses a significant risk to the planned deployment of the system aboard littoral combat ships (LCS). Michael Gilmore, director of the Office of Test and Evaluation (DOT&E), wrote in an Aug. 3 memo to Pentagon acquisition chief Frank Kendall:

'Recent developmental testing provides no statistical evidence that the system is demonstrating improved reliability, and instead indicates that reliability plateaued nearly a decade ago',

Gillmore reportedly went on to say: 'The reliability of existing systems is so poor that it poses a significant risk to both the upcoming operational test of the LCS Independence-variant equipped with the first increment of the Mine Countermeasures (MCM) mission package, and to the Navy's plan to field and sustain a viable LCS-based minehunting and mine clearance capability prior to fiscal year 2020'. The remote minehunting system (RMS) uses the remote multimission vehicle (RMMV), a large, diesel-powered submersible carrying a AQS-20A minehunting sonar.

There are significant implications to delays and ongoing reliability and confidence issues impacting the RMS and associated programmes, including LCS. The preferred anti-access system is the mine – as recognised by North Korea in its recent deployment of 50 of its 70 submarines, all with a mine-laying capacity. Politically, the LCS programme appears to be hitting the stops and this, along with other programme issues, may lend weight to USN and political-military industry complex factions arguing for its cancellation. Overly complicated and insufficiently complex appears to be one of the main arguments. However the matter resolves itself, there is urgent need for (versatile-modular-system) rapid anti-access detection, processing, avoidance and clearance (RADPAC) Warpods – these are as much about sensors as big-data processing. It is in big-data research that

Australia has significant competitive advantage and skills to offer.

As a result of ongoing reliability issues, the LCS mission module office recently requested permission from Congress to continue tests into the next fiscal year, which begins 1 Oct. Over the next few weeks, the Navy will evaluate the system and, in October or November, is to decide whether or not to proceed to the initial operational test and evaluation phase.

ALL ELECTRIC?

The RN and USN are leading the field in the adoption of integrated electric power generation and propulsion for surface ships. However, not all shipbuilders or navies may follow this lead and development of diesel, gas turbine, and hybrid electric propulsion systems may pose reduced risk and cost for medium sized navies.

06 ELECTROMAGNETIC RAILGUN FOR NGS AND AIR DEFENCE TEST PLANS UNFOLD

The US Navy's (USN's) electromagnetic railgun (EMRG) programme is moving ahead. In the near term, the USN's fifth and newest Joint High Speed Vessel (JHSV), USNS Trenton, is to host the first at-sea demonstration of the EMRG sometime in 2016, but the navy is also working to develop a GPS-guided NGS capable Hypervelocity Projectile (HPV) that can be steered towards targets, and hopes to integrate a repetitive rate firing the railgun for trials at sea in 2019. Secretary of the Navy Ray Mabus lampooned the navy's acquisition processes for taking so long to field the system.

EMRG 'will finally be on board a US Navy ship in 2016, but only for testing, and only after several decades of development - that's too long', he said. The 32 mega joule weapon marks a notable increase in capability. It will launch projectiles out

06 The USN's EMRG concept, integrated on an Austal built JHSV, which will host the first EMRG firing at sea. (Source: US Navy)





to 100 miles, whereas the USN's current 5-inch gun can only reach out 13 miles. EMRG could also, potentially, result in savings because as noted by Mabus, its rounds 'cost about USD 25,000 compared to USD 500,000 to USD1.5 million for missiles'. The US Army has expressed interest in the weapons system, for application ashore, across the (brown) littoral space and for forward green ops.

AWD HULL NOT TO BE USED FOR FUTURE FRIGATES

The use of Navantia-designed hull of Australia's Hobart-class Air Warfare Destroyers (AWDs) as the basis for the Future Frigate has been quietly dropped. At the same time, a reported limit on the displacement of the Future Frigate has been set aside in favour of assessing the capability effects of competing platforms. This clears the decks for a robust international competition to build at least eight Project Sea 5000 Frigates, including potentially novel concepts such as offered by VMS packages and extended-modular JHSV packages.

07 RN TYPE 26 FRIGATES – TAKING SHAPE

The emerging Royal Navy Type 26 (Global Combat Ship (GCS)) appears to be showing some of the versatility in design and construction that could potentially set itself as a future export model. The UK has to go back to the Type 12 and Leander classes (built in the 1960s and 1970s) to find a previous successful export design. Nonetheless, allowing for some modularisation the ship may be, on the one hand, overly complicated – like the USS ZUMWALT – while, on the other, seeking a degree of perfection that comes in terms of time and money. Thirteen is not an answer – particularly for a class of ships!

Notwithstanding, the GCS moved to its next milestone on 5 August with the ordering of the first

long lead items for the vessels. Seven contracts, worth USD265 million, were placed by prime contractor BAE Systems with some of its key subcontractors.

The Royal Navy is currently planning to purchase 13 Type 26 vessels to replace its existing Type 23 frigates on a one-for-one basis. This itself represents a cut of Frigates numbers by at least 50% over the past 15 years. Items ordered include air weapons handling systems (Babcock); communications systems (Rohde & Schwarz UKUK); electric propulsion motor and drive systems (GE Power Conversion); gas turbines (Rolls-Royce Power Engineering); integrated navigation and bridge systems (Raytheon); propulsion gearboxes (David Brown Gear Systems); and uptakes and downtakes (WR Davis). The Type 26 Programme Director at BAE Systems stated the contracts:

'will enable our partners in the supply chain to start manufacturing key equipment for the first three ships. This reinforces the strong momentum behind the programme and is an important step towards the start of manufacturing the Type 26 ships for the Royal Navy in Glasgow next year [2016].'

The 7,000 tonne Type 26 is designed to be multi-mission in its capabilities. It seeks to maintain the capabilities of the Type 23 in the anti-submarine warfare (ASW) and general purpose roles, with mission modules designed into the vessels to provide flexibility to conduct humanitarian and other missions. They will be armed with a 5 in (127 mm) BAE Systems Mk 45 Mod 4 gun system; Lockheed Martin Mk 41 vertical launching system (VLS) for anti-surface and ASW weapons; four 12 cell launchers for MBDA Sea Ceptor local air defence system; two Phalanx Block 1B close-in weapon systems, and two 30 mm automated small-calibre gun systems; and a hangar for either two Wildcat (Improved Lynx) helicopters or a single Merlin (MH1).

The success of the Type 26 will need to be judged operationally and seen to be a distinct improvement over the Type 23 Frigates – nicknamed the 'Skoda Class' (in the days before the end of the Cold War when Skoda was not owned by VW). This should represent the baseline for the T26 – yet experience of the Type 45 suggest that, in many respects, it is not as good or as flexible as its predecessor (the Type 42) or its systems and sensors.

The pretension and curse of being a global or littoral combat ship and not simply a type number may also need guarding against. Notwithstanding, there is growing evidence to suggest that the T26 design and timing may be right and that it could represent the least risk, best value-for-money option for the SEA 5000 Future Frigate Programme, expected to be announced mid-2016. The Australian variant would almost certainly have different processors and sensors; including the world-beating CEA CEAFAF Phased Array Radar. It would be hoped that in any exchange of design technology, the UK would include CEAFAF in its own designs – search and TI radars have not been a UK forte since the 1970s...

USN TRUSTS AUSTAL TO BUILD ITS WAR CANOES

Australian shipbuilder and Austal Chief Executive Andrew Bellamy believes Australia should be able to build its own warships and rejected the view that they inevitably will be late and cost too much. A significant number of the Littoral Combat Ship (Independence variant) and joint high speed vessels will be made by the West Australian company that started life three decades ago building crayfishing boats. Austal employs more than 4000 people in the US, about 500 in Perth and 200 in The Philippines – with contracts worth more than USD5 billion to build 21 vessels for the US Navy — 10 littoral combat ships and 11 joint high-speed vessels – in the US. Bellamy is reported as saying that 'he would consider buying the troubled shipbuilder ASC from

07 Type 26 Global Combat Ship, post SDSR 2010.



the government and promoting Austal as a possible partner for a foreign designer and builder if some or all of the navy's new submarines were to be built in Australia'.

Shipbuilding is a strategic industry for Australia, as underlined in the 2009 White Paper and emphasised by the demise of the car industry.

Assistant Navy Secretary Dennis McGinn stated 'the ships were so versatile the US Navy considered them its Swiss Army knife'.

Austal is the only foreign company building warships for the US. The US aims to deploy large numbers of LCS / JHSVs – potentially basing a littoral combat ship at strategic ports such as Singapore or Darwin, and rotate crews in as required.

Mr Bellamy challenged the belief that 'you have to pay a 30 or 40 per cent premium to manufacture in Australia'. It is not true we can't manufacture productively in Australia: 'the problem is not the Australian workforce or the skill set or the designer, because we have exported 250 ships out of Perth, so it can be done'.

At Henderson (Perth), Austal is building a USD250 million fleet of eight Cape-class patrol boats for Australia's Customs and Border Protection Service. It is also hoping to build warships for Saudi Arabia, which is prepared to spend between USD10 billion and USD25bn. Bellamy believes that 'it's too easy to fall into the trap that we can't do this in Australia and export it'. An opinion similarly challenged by The Navy League, see p. 32.

ADVANCING INTO THE VALLEY

The Government's USD70m continuous shipbuilding programme (CSBP) largely champions South Australia at the expense of other ship building centres, including in Perth and Williamstown. Given time-lags between announcements, designs, recruiting and building (twixt flash and bang), Australian shipbuilding is already well into its

valley-of-death. In early September, 100 skilled shipwrights were escorted off the premises at BAE Systems' Williamstown naval dockyard. A further 125 workers will be made redundant in October; adding to the 350 who lost their jobs in October 2014. The final phases of BAE Systems' ship building contracts are well-advanced and a further 500 workers are expected to be made redundant by the beginning of 2016.

COASTAL SHIPPING REFORMS

While industry and manufacturers are backing the Government's proposed coastal-shipping shake up, believing that it will open up competition and make rates more competitive using foreign-flagged and crewed ships in coastal waters – only paying Australian wages if ships remained in Australian waters for more than 183 days a year – this is being seen by the Unions and the ALP as a threat to the maritime base and jobs. Taken together with the China-Australia Free Trade Agreement, there could be considerable pressure on Australia's semi-skilled and skilled worker jobs base that, potentially, opens a significant divide between big business, manufacturers and local employment markets. The argument for a sustainable strategic maritime base in Australia is not just for the building of key elements of ships and submarines in Australia but also keeping skilled jobs and opportunities in-country, notably in South Australia – see p.32. This also extends to the crewing of Australian ships – under the Red and White Ensigns – and maintaining a knowledge economy jobs base well into the future. Recent indications of an official at the Department of Regional Development advising shipping masters to re-register their shipping under a foreign flag shows both a complete lack of maritime understanding and awareness; while potentially exposing underlying incoherence in Government thinking. A competence question

hangs over the new Turnbull Government. It is increasingly likely that the battle lines for the 2016 Federal elections are currently being drawn – and maritime industrial strategy (MIS) and policy implementation is likely to loom large.

TRITON COMPONENT CONTRACT AWARDED TO AUSTRALIAN FIRM

Northrop Grumman has awarded Ferra Engineering a contract to produce components for the US Triton maritime surveillance high altitude long endurance unmanned aerial vehicle (UAV). Contracts to manufacture components for Tritons operated by the RAAF are also anticipated once a procurement decision is reached. The size of Australia's Triton programme is expected to be determined by the DWP.

JOHN WARNER HITS A DOZEN

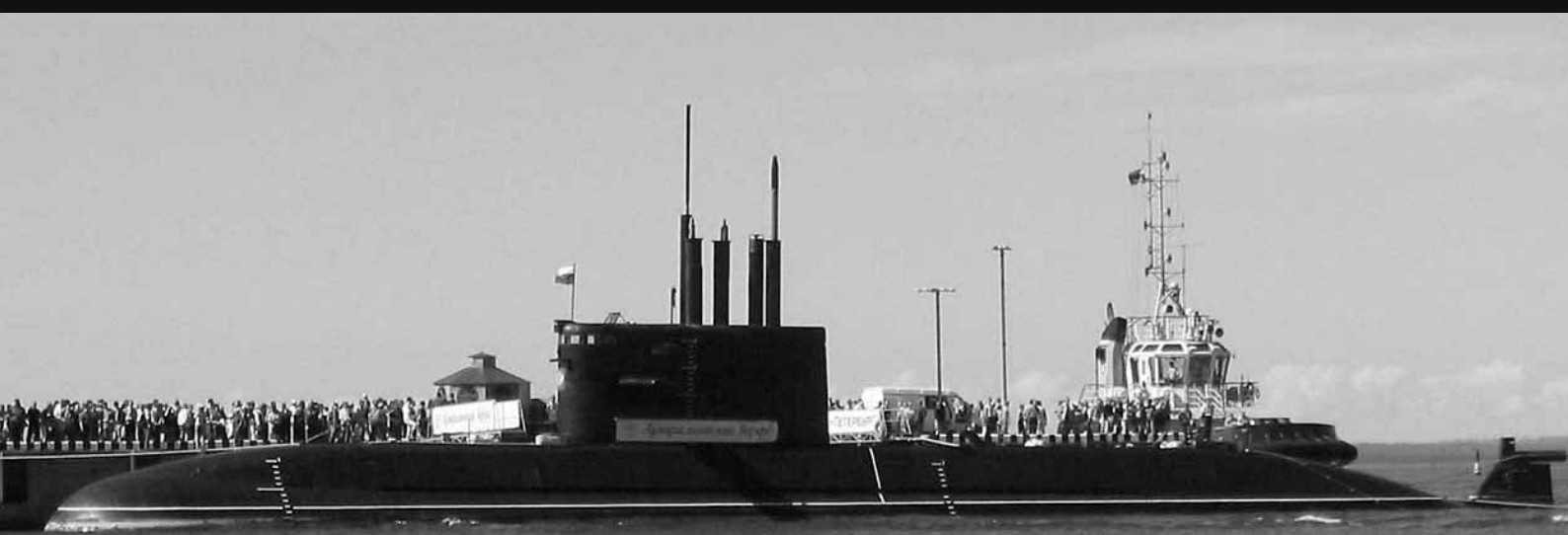
USN JOHN WARNER (SSN 785) conducted sea trials in the Atlantic in May 2015. The boat was handed over to the USN by Huntington Ingalls Industries in June.

Named after the US senator and former secretary of the US Navy (1972-1974), USN and USMC - it is the sixth Virginia SSN to be completed by Newport News, in partnership with General Dynamics Electric Boat. The JOHN WARNER is the second of eight Block III Virginias fitted with a redesigned bow; including a Large Aperture Bow array and two 87-inch Virginia payload tubes for Tomahawk land-attack cruise missiles.

Should Australia consider going Nuclear Propulsion for the last of its 6 Boats, the Virginia Class would be a front runner. USN is known to be sympathetic to such a transfer, build and fuelling cycle technology concept that would also support further development. The UK ASTUTE Class is considered a less attractive but, nonetheless, viable option.

08

Russian Navy Project 677 Lada Class Submarine SANKT PETERBURG (B-585).





08 RUSSIAN SUBMARINES FIT STEALTH TECHNOLOGIES

Russia is developing a range of new sonar stealth composites for its submarines. Potentially these technologies will provide the Russian Navy and its allies with a leap-frog technology over current Western composite designs – dovetailing with Peter Stringer's concepts for a 'Ghost Fleet'. This could potentially alter the balance of force projection (BFP) in both the Baltic and the South China Sea. Multilayer stealth composites have a structure and consistency that absorb sonar signals, so reducing detection of a submarine by towed array type technologies. A prototype system is currently conducting trials of full-scale specimens of components from a Russian diesel-electric Lada-class submarine. It is likely that the new composites will be integrated onto all Russian submarines.

09 NASA DEVELOPS TITAN SUBMARINE DESIGN

The NASA Titan Submarine design has been awarded a second round of funding through their Innovative Advanced Concepts (NIAC) program. Phase II will focus on advancing the Technology Readiness Level (TRL) of the concept by (1) retiring risks found in the Phase I design, (2) gathering new Kraken Sea observations by Cassini, and (3) further defining science goals and instruments to fulfil them. The craft will autonomously carry out detailed scientific investigations under the surface of Titan's (one of Saturn's moons) Kraken Mare (a methane sea), providing unprecedented knowledge of an extraterrestrial sea and expanding NASA's existing capabilities in planetary exploration to include in situ nautical operations.

Major risks found in Phase I conceptual design centered on vehicle operations in a liquid hydrocarbon sea. Cryogenic experts at the NASA Glenn Research Center will develop models to

explore mixtures and pressures of cryogenics and gases and how they would react with a warm submarine.

10 THE GREAT AUSTRALIAN [SUBMARINE] BIGHT

Liberal MPs fear the loss of federal seats in South Australia if the Government gives Japan the contract for the next fleet of submarines. Currently the Government is running a 'competitive evaluation process' – conjured up for the SEA 1000 Project – which could go to France, Japan or Germany. The new Saab-Japan tie up makes the Japanese boat again the front runner, with the boats being assembled and maintained in Australia – with a substantial Australian (Saab) front-end.

Liberal seats like Hindmarsh, held by first-term MP Matt Williams, would be under threat if the contract goes substantially abroad. The then PM Tony Abbott responded:

'I'm working as hard as anyone with some of my colleagues to maximise the opportunities and the jobs in South Australia for the defence ship industries, having meetings with senior Government ministers who are listening to the various options' Tony Abbott also gave a guarantee there would be more jobs for South Australian ship builders. Tony Abbott restated when asked about the electoral threat: 'there is a process in place — a competitive evaluation process — that involves working with the French, the Germans and the Japanese to get the best possible submarines for our country at a fair and reasonable price and maximising the local element in the build'.

In February, Defence Minister Kevin Andrews said he expected significant work would be undertaken in Australia, particularly during the build phase, leading to the creation of at least 500 new jobs. Senator Xenophon that he plans to field candidates in every Liberal-held seat in South Australia, in a

bid to pressure the government into building a new fleet of submarines locally.

According to Labour employment spokesman Brendan O'Connor, Mr Abbott has already done a secret deal with Japan. While Foreign Minister Julie Bishop's parliamentary secretary, Steven Ciobo, acknowledged 'there was understandable concern from some of his SA colleagues about the process'.

A RIGHT AUSTRALIAN POT MESS

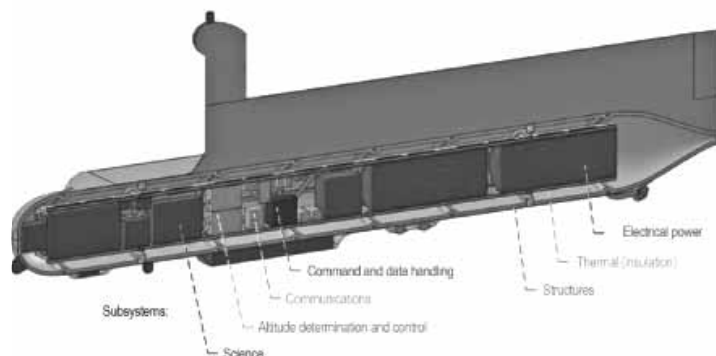
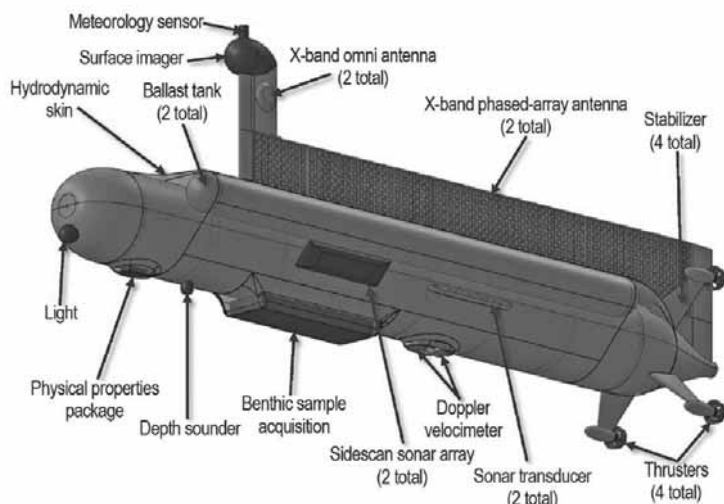
SEA 1000 the Future Submarine will, according to some commentators, be one of the biggest and most expensive infrastructure projects in Australian history, 'as ambitious as the Snowy Mountain Hydro-electric Scheme' or the [yet to deliver] National Broadband Network. David Johnston, then defence minister, stated:

'What is wanted is a conventional submarine (one powered by diesel-electric motors), with the power, speed and range of a nuclear submarine. Such a boat doesn't exist'.

The previous Chief of Navy, Vice Admiral Ray Griggs, pointed out that Australia 'hasn't even begun to acquire the infrastructure or invest in the training needed to support nuclear-powered submarines'. Designers of conventional submarines, such as the Swedes and Germans, have much shorter ranges – with some analysts suggesting that: 'designing a submarine for the Baltic Sea is like designing a submarine to do laps around the Gulf of Carpentaria, in winter'.

Most estimates suggest that 12 future submarines will cost in the region of \$36-40 billion. The chair of the German naval vessel and submarine manufacturer ThyssenKrupp Marine Systems (TKMS) suggested a figure of \$20 billion, based upon a 'sailaway' (sale-a-way?) price. But this does not include design or defence project-management costs – and so is not a like-for-like. Such procurement could arise in much higher

09 Titan Submarine – NASA.



ownerships costs, as in the Collins class that would dwarf the current \$40 billion estimate. However the detail behind the \$40 billion also remains sketchy. The number question is also, while correct, not favoured by surface navy officers or by other senior Defence officials – reluctant to give ground on their own special projects.

The Defence balance also needs to consider the investment imposed on countering submarines. There is a submarine arms race under way in the Asia-Pacific. More than half the world's submarines operate in the region through which all of Australia's maritime trade passes. Admiral Harry B Harris Jr, commander of the US Pacific Fleet. Fleet stated in Canberra:

'I'm concerned by the aggressive growth of the Chinese military, their lack of transparency and a pattern of increasingly assertive behaviour in the region'.

Critical decisions need to be made following the DWP - prior to the change in PM, this was expected in October for the run in to the next Federal Election. This makes March 2016 for a Submarine announcement and an October election more and more likely. Not long then – given the ravages of the First Principals Review – to get it right. And noting the competence question facing the new PM (if not on rhetoric and action) this is not a foregone conclusion and carries significant pol-mil risk.

While the upside of a Japanese-Swede (possibly brokered by UK) agreement might include sharing valuable technical data, the Soryu submarine variants may not be the easy sell initially hoped for. The more so in that their purchase may, in and of itself, create the very conditions of instability occurring – that they are intended to deter. And, while the Saab-Japanese deal (potentially brokered by Babcock and BAE) – with significant front end build and assembly in South Australia – continues to be the least technical and financial risk, its overly symmetric repost to China may make it the less

favoured solution in the longer run. The deal may also raise competition issues for BAE, if it is seen to have too strong a hand in both SEA 1000 and SEA 5000 (the Future Frigate project).

Unlike Germany, which was fully reconstructed after WWII and has made a deep and lasting acknowledgement and atonement of its War Crimes and a significant contribution to Liberal Democracy, The Emperor of Japan has never done so. Nor any of his Prime Ministers; including – despite his strongest endeavours – the most recent. There are many Australian families who lost family members in WWII and consider this lack of atonement to be just as sensitive as do the Chinese, Koreans, Malays and Singaporeans. Time may well heal but an aggressive militaristic Japan is not necessarily the solution. Particularly if it were to exacerbate old wounds and damage relationships with our major Trading Partner.

IT'S THE [DEFENCE] ECONOMY, STUPID

US Defence spending has doubled in 2001 US Dollar terms since 911 – an increase of 60% in real terms and allowing for Defence Cost Inflation (DCI). It is clear that whoever wins next years' Presidential Elections there is going to be change to the budget and its Title 10 entitlements. Leading the charge are Senators John McCain (R-Arizona and ex USN Pilot, shot down by the Vietnamese in 1965 during the Vietnam War) and Mac Thornberry (R-Texas) chairs of the Senate and House Armed Services Committees. The aim is to reduce the paperwork and devolve more responsibilities to the Service Chiefs.

The danger is that faced with both existential and interstitial forces the result will be hyper-competition between the Service Chiefs and a fight to the death. This all occurring at a time when China is growing in relative strength and making increasing call on already overstretched U.S. Assets.

Given the ballooning Defence budget and years of hiding fat in the wars of Iraq 2.0, Afghanistan, Iraq 3.0, even a freezing in Defence spending may cause a shock to the system – amounting to a real term cut in defence spending of 60% over the next decade or to about 70% of the 2001 budget. The simple fact is – as both Norm Augustine and Philip Pugh pointed out – that the current designs of carriers, tanks, planes and crewing models are simply unaffordable. They are all going to have to change.

There is a grim irony in that President Reagan and Mrs Thatcher sought to bankrupt the Soviet Union by challenging them to 'keep up' – and they did just that. The US and its Western Allies have bankrupted themselves through almost fifteen years of conflict combined by lack of proper thinking and design – all occurring when a real and pressing existential state-on-state, peer level threat is taking shape.

For US Allies this poses a very real existential challenge – for years, including the UK and Australia and most European NATO Members, they have had a free ride on the back of the US Military. The US is now tilting to the Pacific and its self-reliance on oil means that it is no longer at the beck-and-call of the Saudis to do its bidding, e.g. in Syria and Iraq. Setting aside Free Riding, is the concern that US relative withdrawal will lead not to pacification but to escalation – heating up the South China Seas arms race as nations compete to fill the vacuum. ■

10

HMAS RANKIN returns to Fleet Base West after conducting a Full Cycle Docking activity in Adelaide, South Australia.



STRATEGY, THE ADF AND AMPHIBIOUS WARFARE: PAST, PRESENT & FUTURE

Ken Gleiman and Peter J Dean

The delivery of Australia's new amphibious warships, HMA Ships CANBERRA and ADELAIDE, is an important milestone in the ADF's quest to develop a strategically relevant amphibious warfare capability. Australia's position in the world makes the effort a strategic imperative, but the ADF still has a long way to go and many critical decisions ahead if it's to develop an amphibious warfare capability that's ready for future challenges. Based on Gleiman and Dean's 2015 ASPI Report entitled *Strategy: Beyond 2017, The Australian Defence Force and amphibious warfare* [1], this paper examines ADF Amphibious Warfare Strategy, past, present and future.

The Gallipoli landings of 1915 are an instantly recognised part of the Anzac legend and an integral part of Australian military history. Yet, beyond questions of whether or not the troops were landed on the wrong beach, most Australians pay little attention to the amphibious component that enabled the campaign. Even fewer would know that Australia's first major military action in World War I was a joint amphibious expeditionary operation against German New Guinea in 1914.

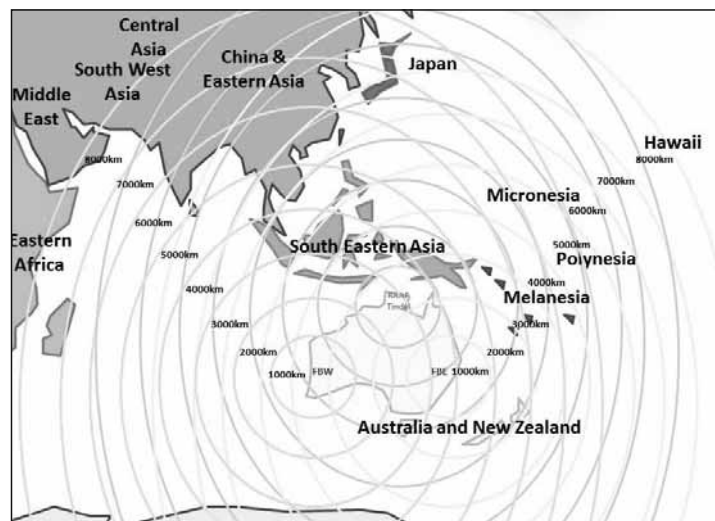
While most Australians are familiar with the epic battles on the Kokoda Track during World War II, few understand the fundamentally maritime nature of the New Guinea campaign, and even fewer know much about the major amphibious operations by our forces from 1943 to 1945 as part of the war in the Pacific, which were the largest and most complex military operations ever undertaken by Australia's military forces.

Note 1. The Navy League recognises the Battle of the Coral Sea as being as significant to Australia as Kokoda and yet it is this and not the Battle of the Coral Sea that remains uppermost in Australia's martial consciousness. In less than two years' time it is the 75th Anniversary of the Battle of the Coral Sea. The Navy League led on the 50th Anniversary in 1992 when President George Bush (Sr.) attended.

Amphibious warfare remained significant for the Australian military after World War II. It included large-scale US amphibious operations in the Korean War, the maritime sustainment of Australian operations in Vietnam, the deployment of ADF amphibious forces in Vanuatu (1988), Somalia (1993), Bougainville (1990 and 1994) and East Timor (1999 and 2006), and numerous humanitarian and disaster relief operations, such as after the 2004 Indian Ocean earthquake and tsunami¹.

Beyond this rich but largely overlooked amphibious tradition is the fact that Australia's the only one of the six geographically largest countries that's completely surrounded by water. In addition, Australia is directly south of one of the world's largest archipelagic and littoral regions. Despite these facts of history and geography, we have for a long time lacked a maritime consciousness [2]. Only at intermittent points in its

history has the Australian military been required to develop, maintain, deploy and sustain a major amphibious warfare capability.



Army bases its Future Land Operating Concept (2009) on operating from RAAF Tindal. The actual (amphibious) ADF Primary Operating Environment (POE) incorporates Fleet Base West, Fleet Base East and Darwin. 8000km is approximately 4320nm. (RCB)

Our intent is to foster an informed debate, catalyse the necessary analysis, and help lead to timely and sound policy decisions. If the Australian Government wants to produce a true amphibious capability, there's much to be done. This short paper outlines what we think are some of the crucial steps.

STRATEGIC CONTEXT

In November 2014, the RAN introduced Australia to its newest and largest warship, HMAS CANBERRA. The delivery of this \$1.5 billion, 27,000-tonne amphibious assault ship was a significant milestone in what has, so far, been a decades-

long effort to build a robust Australian amphibious warfare capability. Soon, CANBERRA's sister ship HMAS ADELAIDE will be commissioned. These ships are referred to as 'landing helicopter docks' (LHDs), and are designed to support multiple vertical take-off platforms during operations; these particular ships are also able to deploy land forces by maritime landing craft.

When HMAS ADELAIDE is commissioned, Australia will have the two most important pieces of hardware in the quest for amphibious warfare capability, but it's well understood across the ADF and the defence community that there's still a long way to go. It's easy to focus too narrowly on the hardware involved in capability development. These ships are just 'hosts' that enable amphibious operations. Fundamental inputs to capability other than major systems are needed to develop capability; most significantly, the integration of other key inputs more often than not presents the greatest challenge for any military service.

Building a complex joint capability, such as amphibious warfare capability, requires the integration of the efforts of more than one service and is therefore an even more difficult challenge. The ADF is still some time and many tough decisions away from achieving its amphibious warfare potential.

1. R.C. Blake, 'Australia has a unique challenge: we have to go 4,000km to have an influence and 4,000km beyond that to have an affect' in the Creswell Oration 2015, Rear Admiral Stuart Meyer CSC*, RAN, *THE NAVY*, Vol. 77. No. 3, Jul-Sep 2015.
2. By Ed., noting: the forthcoming merger of CSIRO with NICTA; the crises in defence research and leadership (following the First Principals Review e.g., DSTO or DSTG?); and, the quality of research-based Higher Education / Degree by Research (PhD / MPhil) provision from Australian Universities, including systemic and chronic underfunding.

The ADF has developed a detailed, integrated and truly joint plan to develop and validate an impressive amphibious warfare capability by mid-2017. In the culminating event of 2017, it will test its ability to deploy an Amphibious Ready Group (ARG). This powerful joint force element will be a proof of concept, but won't yet be a sustainable on-call capability or 'ready' force.

Significant capability gaps and shortfalls have been identified and require solutions. Australia's political and military leaders will need to make several key decisions in the next two years if they want to develop an amphibious warfare capability that's relevant and ready for the crises and contingencies of the current and future operating environments. All of those key decisions require the acceptance of risks and trade-offs. None will be easy.

RECOMMENDATIONS

We set as the overarching research question:

'What decisions do ADF leaders need to make in order to ensure that Australia has an amphibious warfare capability that's effective and relevant to future challenges?'

The aim was to identify some of the key decisions to be made over the next two years and provide specific recommendations on them. From this we developed six recommendations that we believe will directly inform the decisions of leaders in the Australian Government, the ADF, the often overlooked but hugely important APS, research² (incorporating the University Sector, CSIRO, NICTA, DSTO and RPDE) and industry.

1. Clarify expectations
2. Establish and empower joint capability management
3. Empower command and control
4. Establish an Amphibious Centre of Excellence
5. Establish tiered amphibious readiness within the Army
6. Commission a study to prioritise the Army's enabling capabilities.

Note 2: In many respects, the six recommendations echo and align neatly in part or in full with the Navy League's own 'Statement of Policy for the maintenance of the maritime wellbeing of the nation', see page 32.



NUSHIP ADELAIDE (L01) informally enters Sydney Harbour, July 2015, for its first docking.

1. CLARIFY EXPECTATIONS

The Australian Government should use the upcoming 2015 Defence White Paper (DWP) to clarify its expectations for a robust, combat-ready, scalable amphibious force in a changing and increasingly challenging strategic environment. That force must be able to conduct persistent strategic shaping, be ready to respond to crises, and be prepared to mobilise for amphibious warfare operations that are at the higher end of the spectrum of complexity and risk.

The ADF should be expected to employ an Amphibious Ready Element (ARE) within the primary operating environment in a matter of days and to maintain the ability to employ a full Amphibious Ready Group (ARG) in less than 45 days. Furthermore, the ADF should be expected to conduct regional engagement activities with the ARE for up to 90 days of every year. By meeting those standards, the ADF will be able to act decisively in crises and mobilise for contingencies in the primary operating environment and Indo-Pacific region. The amphibious force must be able to spearhead the ADF's potential responses to the most likely regional challenges, such as humanitarian assistance and disaster relief missions, complex stability operations, limited forced-entry operations and littoral manoeuvre.

The Bataan Amphibious Readiness Group Underway in the North Atlantic comprising the flagship, USS BATAAN (LHD 5), the amphibious transport dock ship USS MESA VERDE (LPD 19) and the amphibious dock landing ship USS GUNSTON HALL (LSD 44) escorted by the USS ANZIO (CG-68), a Ticonderoga-class cruiser guided missile cruiser. An ARG consists of: a naval element – a group of warships known as an amphibious task force (ATF); a landing force (LF), in total about 5,000 people and a Tailored Air Group (TAG).





Amphibious Assault (Sierra Leone) by 42 Royal Marine Commando – launched from the ARG Flagship LPH HMS OCEAN (L12).

Task Group with permanent component staffs. This will provide valuable continuity and the expertise needed to manage complex amphibious operations.

For this permanent joint HQ to operate effectively, the ADF will need to ensure that it allocates some of its best and brightest personnel and that the HQ is effectively resourced. The HQ will be required to coordinate multi-service force-generation cycles, lead strategic shaping (engagement) operations, and be prepared for both crisis response and major contingency operations. The Amphibious Task Group (ATG) and its component CLF and CATF command elements will be force employers, and the services should take on their proper roles as amphibious force generators, tasked with raising, training and sustaining the elements that will be assigned to the ATG.

2. ESTABLISH AND EMPOWER JOINT CAPABILITY MANAGEMENT

To ensure that the ADF's joint amphibious capability is relevant and sustainable over the long term, the Secretary of the Department of Defence and the Chief of the Defence Force should establish a permanent and empowered joint capability management system in Defence with responsibility for amphibious warfare. The full implementation of the recommendations of the *First Principles Review: creating one Defence* (FPR 2015) will be a very good start, but success will depend largely on the legislated authorities of the Chief and Vice Chief of the Defence Force to direct capability decisions and manage amphibious warfare capability development.

Despite the exceptionally impressive work of a non-permanent Joint Amphibious Capabilities Implementation Team and the Joint Capability Coordination Division, the development and delivery of HMAS CANBERRA and HMAS ADELAIDE and the certification of an ARG in 2017 won't be the end of amphibious warfare development in the ADF. Rather, it will be only the first stage of a continual cycle of development to ensure that this world-class capability reaches its full potential and continues to evolve.

3. EMPOWER COMMAND AND CONTROL – IT'S A FULL-TIME JOB

The Chief of the Defence Force and the service chiefs should establish a permanent land component headquarters element for amphibious warfare; it should be under the command of a jointly staffed Amphibious Task Group (ATG). Amphibious warfare operations are some of the most complex operations in joint warfare. A strategically relevant amphibious warfare capability requires nothing less than permanent headquarters elements that have command authority over the elements assigned to support amphibious operations.

For the ADF, this means ensuring that the ATG is a Navy-led joint organisation that can deploy on short notice to command an ARE, and can mobilise and employ an ARG. Most importantly for the ADF and the Army, this means establishing a permanent landing force headquarters staff led by an O-6 (Colonel) serving as the Commander of the Landing Force (CLF). The new joint structure establishes permanent command and control architecture with a joint staff enabled Commander Amphibious

4. ESTABLISH A JOINT AMPHIBIOUS CENTRE OF EXCELLENCE

The Chief of the Defence Force, with the support of the service chiefs, should build and preserve institutional amphibious warfare knowledge and culture by establishing a joint Amphibious Centre of Excellence (ACE).

The ADF currently lacks the tradition, culture and organisational expertise needed to maintain and employ a world-class amphibious warfare capability. Individuals and organisations across the ADF have done an impressive amount of work over the past several years to facilitate institutional change. This has included the embedding of US Marine Corps and Royal Marines officers into the ADF, lateral transfers from the Royal Marines and Royal Navy, and spending millions of dollars on sending ADF



A MRH 90 helicopter prepares to land on HMAS CHOULES (L100) during Talisman Saber 15 (Photo: ABC News: Sally Brooks)

personnel to US amphibious warfare schools. To maintain this progress, to capture expertise and to evolve this capability, the ADF must move beyond temporary structures and foreign training. It needs to build a permanent learning institution with the mission of inculcating amphibious warfare expertise across the ADF. This will allow it to evolve doctrine, provide for the training of individuals, provide expertise to other ADF and single-service courses and education facilities, generate training teams to assist in unit-level training, and provide highly qualified staff to certify amphibious elements.

5. ESTABLISH TIERED AMPHIBIOUS READINESS, INTEGRATED WITHIN PLAN BEERSHEBA, IN THE ARMY

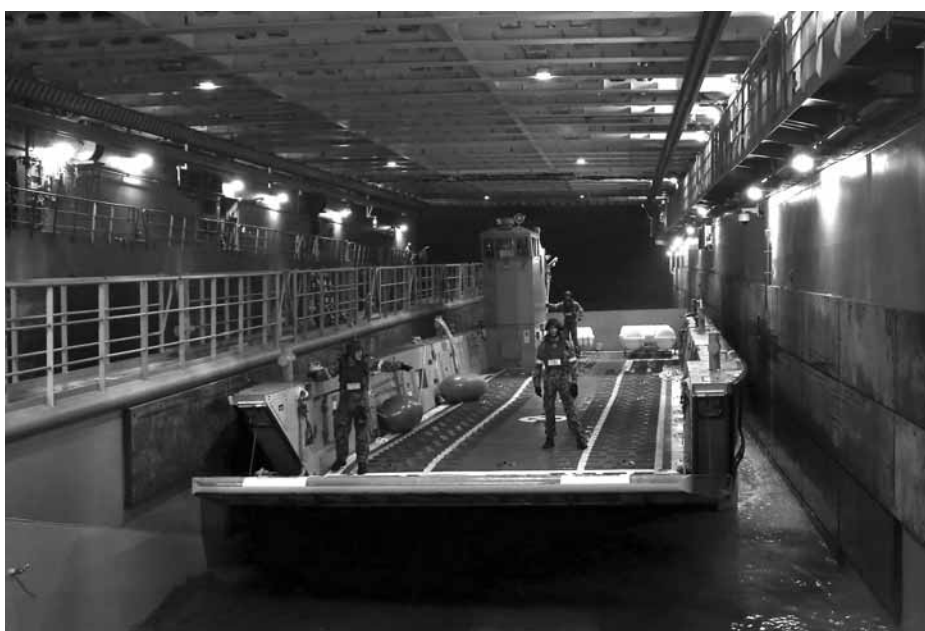
The Chief of Army should establish a system of tiered amphibious readiness that provides a dedicated, top-tier, high-readiness ARE and a proficient ARG.

Of the three services, the Army faces the greatest challenges in meeting the likely demands of the Australian Government for amphibious warfare capability. More than three years ago, in Plan Beersheba, the Army announced a strategic decision to build a sustainable, balanced force that is not optimised for any specific mission, but is instead constructed to be adaptable, relevant and ready for the broad spectrum of warfare. However, Plan Beersheba doesn't yet adequately meet the joint amphibious capability demands of likely operations within the ADF's primary operating environment and the Indo-Pacific region. Therefore, we recommend the development of tiered amphibious readiness that integrates with the Beersheba model.

6. COMMISSION AN ARMY STAFF STUDY TO DETERMINE THE PRIORITY GROWTH NECESSARY FOR THE DEVELOPMENT OF KEY COMBAT SUPPORT AND SERVICE SUPPORT CAPACITY

The Army is suffering from a deficiency in key combat support and combat service support elements. The additional requirements of maintaining a standing ARE and supporting Special Operations Command (SOCOMD) already add to a high operational demand caused by the need to support the ready and readying combat brigades. It's difficult to see any credible options for the Army without some growth in end strength.

An internal Army study would help the Chief of Army to identify requirements and then prioritise growth towards the enabling elements that are in the highest demand and those that require the most specialisation to support amphibious operations. It's highly likely that growth will be needed in aviation, engineering and logistics.



Dock Operations (D-OPS), HMAS CANBERRA (L-02).

This will require the Army to invest significant resources in elements that force-generate a standing ARE capability, especially combat support and combat service support elements (often referred to as 'enablers'). The units that generate the elements of the landing force of the standing ARE should be dedicated to amphibious warfare. To ensure the integrity of Plan Beersheba, the Ready Battle Group (RBG) and attached enablers within the ready brigade should be used to provide the necessary additional combat power when amphibious operations require the deployment of an ARG. This model would also provide depth in amphibious warfare specialty tasks (the standing ARE) and a breadth of proficiency across the whole force (the RBGs). This would be a uniquely Australian solution to a uniquely Australian amphibious warfare challenge.

CONCLUSIONS

With the acquisition of the two LHD amphibious assault ships, Australia has committed the ADF to the path of developing an amphibious warfare capability that's relevant and ready for the challenges of the future. Our strategic position as an island nation in a rapidly changing littoral region reinforces the need for an amphibious capability that can continue to improve and adapt in the years to come.

Our six recommendations will help to set the conditions for the further evolution of Australia's amphibious warfare capability. By clarifying its expectations, the Australian Government will provide the ADF, and especially the Army, with the information that they need to make difficult decisions about how many resources to invest in amphibious capability and readiness.

By empowering command and control for amphibious warfare, the ADF will ensure the continuity and specialisation needed for amphibious warfare tasks. Treating amphibious warfare C2 as the full-time job of a permanent joint structure will prevent costly operational errors in amphibious operations. By establishing a joint Amphibious Centre of Excellence, the ADF will capture its existing amphibious warfare expertise and ensure that its organisational culture maintains knowledge and continues to innovate in ways appropriate to future contexts.

By establishing a system of tiered amphibious readiness, the Army can balance the need for depth and breadth in amphibious warfare specialisation and proficiency across its ranks while maintaining the strategic logic and efficacy of Plan Beersheba. Finally, by commissioning an internal staff study on support forces, the Army can identify and prioritise the necessary growth in key enabling capabilities. ■

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[1]. Gleiman, K., and P.J. Dean, *Strategy: Beyond 2017, The Australian Defence Force and amphibious warfare*, in *Strategy*, ASPI (Ed). 2015. The Australian Strategic Policy Institute, July: Canberra.

[2]. Evans, M., *The third way: towards an Australian maritime strategy for the 21st century*. In *Armies and maritime strategy: 2013 Chief of Army History Conference*, P. Dennis (Ed). 2014. Big Sky Publishing: Canberra. pp. 327-358.

CORAL SEA 2017:

WE WILL REMEMBER

Rear Admiral Andrew Robertson AO DSC RAN (Rtd)

The 2015 anniversary of the Battle of the Coral Sea has come and gone with little commemoration or even mention in our country, for Australia today seems largely oblivious to its importance to our defence in WW II. All are aware that the final victors in both WWI and WWII were of course the powerful armies, and their exploits are rightly so, well recorded and remembered yearly in our splendid ANZAC tradition. But the vital roles of the Navy and the Air Force are not well understood.



The Battle Area (ANZAC.ORG.AU), Action 1, 4 May; Actions 2 and 3, 7 May and Action 4, 8 May (Main Battle).

'What was the main strategic requirement which had to be achieved before Allied armies could be launched and supported to bring about the final victory?'

Fundamentally, in both World Wars, the major requirement was to control needed ocean areas and trade routes to bring the resources of the British Empire – from Britain, Canada, India, Australia, New Zealand, South Africa, the many British Colonies, and finally the might of the United States to where these resources were needed.

This essential requirement involved the destruction or neutralisation of enemy maritime forces, whether surface warships, submarines, merchant raiders or aircraft, and the clearing of minefields. Indeed, the British Prime Minister Winston Churchill once famously observed that:

'the only Battle in WW II which really scared him was the Battle of the Atlantic, for if lost the war would have been lost'.

STRATEGIC AMNESIA

In December 1941 Japan entered the war and her naval forces swept all before them, destroying the American Battleships at Pearl Harbour, the British Battleship HMS PRINCE OF WALES with the Battle Cruiser HMS REPULSE off Malaya and the Dutch/US/British/Australian naval forces in the Dutch East Indies (Indonesia). The allies then lost any capability to control the ocean areas and the shipping routes in East and South East Asia, the Eastern Pacific and the Bay of Bengal. The fall of the Philippines, Malaya, Singapore, Hong Kong, the Dutch East Indies, northern New Guinea and Western Pacific Islands was inevitable as they could not be supported.

By April 1942 powerful Japanese naval forces under Admiral Inouye in his flagship at Rabaul were poised to strike south to cut off Australia from

| Allied Naval Forces | Japanese Naval Forces |
|--|---|
| Task Group 17.2 Cruisers USS MINNEAPOLIS USS NEW ORLEANS USS ASTORIA USS CHESTER USS PORTLAND Destroyers USS PHELPS USS DEWEY USS FARRAGUT USS ALWYN USS MONAGHAN | Port Moresby LF Light Carrier SHOHO † Heavy Cruisers AOBA KAKO KINUGASA FURUTAKA Light Cruisers YUBARI TENRYU TATSUTA Destroyers SAZANAMI OITE UZUKI ASAMAGI MUTSUKI YUNAGI YAYOI Minesweeper / layer TSUGARU GUNBOATS KEIJO MARU SEIKAI MARU NIKKAI MARU |
| Task Group 17.3 Cruisers HMAS AUSTRALIA HMAS HOBART USS CHICAGO Destroyers USS PERKINS USS WALKER | |
| Task Group 17.5 Carriers USS YORKTOWN * USS LEXINGTON † (Approximate 125 aircraft) Destroyers USS MORRIS USS ANDERSON USS HAMMANN USS RUSSELL | Carrier Strike Force Carriers SHŌKAKU * ZUIKAKU (Approximate 125 carrier aircraft) Heavy Cruisers MYOKO HAGURO Destroyers ARIAKE YUGURE SHIGURE SHIRATSUYU USHIO AKEBONO TANKER TOHO MARU |
| Task Group 17.6 Destroyers USS SIMS † USS WORDEN Fleet Oilers USS NEOSHO † USS TIPPECANOE | |
| LF = Landing Force † Sunk * Badly Damaged | |

US support and prevent the use of our country as a base for a repost against Japan. The US decided that this move must be defeated and two aircraft carriers (USS LEXINGTON and YORKTOWN) with strong forces of cruisers, destroyers, submarines and support ships were sent to the South-West Pacific.

Australia provided the Heavy Cruiser HMAS AUSTRALIA, and the Light

Cruiser HMAS HOBART under Rear Admiral Sir John Crace RN (an Australian from the Canberra area serving in the Royal Navy) and elements of the RAAF.

The RAN Coastwatcher organisation (covering not only the mainland but New Guinea and the islands of the Solomons) and the US/Australian code breaking unit in Melbourne proved to be of great importance in the coming major battles in the South West Pacific. Admiral William Halsey the US overall commander famously stated:

'The Coastwatchers saved Guadalcanal and Guadalcanal saved the Pacific'.

STRIKE HARD AND SOUTH

The Japanese plan was to strike southwards in two thrusts – to take Tulagi Island in the Southern Solomons followed almost immediately by a major assault on Port Moresby, the airbase and centre of New Guinea administration in the Coral Sea. At the same time it was hoped to trap and destroy by a naval pincer movement the American aircraft-carrier force known to be in the Coral Sea area. A force based on two modern Japanese aircraft carriers would sweep round the southern Solomons entering the Coral Sea from the South East while a force of heavy cruisers with one smaller aircraft-carrier would attack from the north. Seaplane carriers would establish bases for reconnaissance at Tulagi and Deboyne Island in the Louisiade Archipelago (on the northern edge of the Coral Sea).

The Japanese forces consisted of 62 ships including three aircraft Carriers (SHŌKAKU, ZUIKAKU, and SHOHŌ), two seaplane Carriers, 15 Troop transports, cruisers, destroyers, submarines, mine-sweepers and support vessels.

Japanese Naval Forces

Tulagi Invasion Force

Destroyers

KIKUZUKI †

YUZUKI

Minesweepers / layers (++)

OKINOSHIMA †?

KOEI MARU †?

Transport

ASUMAN MARU

Tulagi was occupied by the Japanese unopposed, on 3rd April. Admiral Fletcher USN commanding the allied naval forces immediately launched a heavy air attack on that invasion force, sinking a destroyer and three minesweepers, but having little overall effect.



A mushroom cloud rises after an explosion on board USS LEXINGTON (CV-2), 8 May 1942. Note USS YORKTOWN (CV-5) and the destroyer USS HAMMANN (DD-412), standing by, on the left.

Vice Admiral Frank Jack Fletcher, USN

1885-1973



Born in Marshalltown, Iowa Fletcher attended the U.S. Naval Academy in 1902; graduating in 1906 and commissioned Ensign in 1908 following two years at sea. In 1910 Fletcher assumed command of USS DALE in April 1910 – transferring to USS FLORIDA in December 1912, he was aboard during the conflict with Mexico, where his conduct at the Battle of Veracruz led to him being awarded the Medal of Honor.

During WWI, he served as Gunnery Officer of USS KEARSARGE, after which he assumed command of USS MARGARET before taking command of USS BENHAM in May 1918. For distinguished service as Commanding Officer he was awarded the Navy Cross.

He completed the Senior Course at the Naval War College, Newport in 1930. Appointed Chief of Staff to the Commander in Chief, U.S. Asiatic Fleet in August 1931, he transferred to the Office of the Chief of Naval Operations in 1933 and then as Aide to the Secretary of the Navy. He assumed command of USS NEW MEXICO, flagship of Battleship Division Three in June 1936. Returning to the Pacific in 1939, he became Commander Cruiser Division 3; Commander Cruiser Division 6; Commander Cruiser Scouting Force; and Commander Cruiser Division 4.

On January 1, 1942, Rear Admiral Fletcher took command of Task Force 17 on board USS YORKTOWN. There was some opposition from within Navy, since he was chosen over more senior officers to lead the carrier task force.

Appointed to the US Navy General Board in 1946, he retired as Chairman in May 1947 as full Admiral. Many of his papers were lost in combat and Fletcher declined invitations to reconstruct his memoirs and notes for Naval historians. This led to criticism from historians – which, building on his reputation for withdrawing his carriers from the beachhead led, potentially, to his contribution from the Battle of the Coral Sea onwards, being underestimated.

DECISIVE RESPONSES

Without a doubt, May 7, 1942, vicinity of Coral Sea, was the most confused battle area in world history¹.

The Battle of the Coral Sea, the first in a new form of naval warfare between aircraft-carriers in which neither side sighted their opponents, took place from 4 to 8 May. The passage of weather fronts and much false reporting by reconnaissance aircraft on both sides caused confusion as each side tried to find the other at long range. Indeed on one occasion a confused Japanese pilot tried to land on a US aircraft-carrier!

¹ Vice Admiral H. S. Duckworth, after reading Japanese records of the battle, 1972.

Vice Admiral Shigeyoshi Inoue, IJN

1889-1975



From Sendai in the Tōhoku region of Japan, Inoue attended the 37th class of the Imperial Japanese Naval Academy, graduating second. As a midshipman, he was assigned to the cruiser SOYA on its 1910 cruise to Manila, Ambon, Townsville, Brisbane, Sydney, Hobart, Melbourne, Fremantle, Batavia, Singapore, Hong Kong, Makung, and Keelung. Reassigned to the cruiser KURAMA, he attended the coronation ceremonies for King George V in London in 1911. He was promoted to Lieutenant at the end of 1915, and transferred to the battleship FUSŌ. Participating in operations against the Imperial German Navy, he was not involved in combat. Given command of the dispatch vessel YODO in 1917 and appointed military attaché to Switzerland in 1918 and ordered to learn German. In 1919, he was part of the Japanese diplomatic delegation to the Paris Peace Conference. In 1920, he was appointed military attaché to France, where he learned French!

Following Naval Staff College, and promotion to Commander, he was appointment naval attaché to Italy from 1927–1929, after which he was promoted to Captain. A follower of Admiral Isoroku Yamamoto, he opposed the Tripartite Pact with Fascist Italy and Nazi Germany and was a leader of a military leftist clique opposed to Japanese fascism and overseas expansionism.

Promoted to Rear Admiral, 15 November 1935, he was made Vice Commander of the IJN 3rd Fleet in 1939 and was promoted to Vice Admiral.

After the perceived Japanese 'defeat' at the Battle of the Coral Sea in May 1942, he was relieved of his command and returned to Japan to become commander of the Imperial Japanese Naval Academy. After the war, Inoue became an English and music teacher at his house in Yokosuka. The site of his home is now a public park.

The main actions took place on 7th May. The small Japanese aircraft carrier IJN SHOHO was sunk and the SHŌKAKU was heavily damaged. The ZUIKAKU had major losses of aircraft and trained aircrew. Neither Japanese carrier was able to take part in the decisive Battle of Midway which took place three weeks later.

The US lost the USS LEXINGTON – one of the two largest carriers in the world – after being hit by torpedoes and bombs and later a huge fire on board. The carrier YORKTOWN was damaged but after a herculean repair effort in Hawaii was able to join US carriers in the Battle of Midway. A USN tanker and a destroyer were also sunk.

After the sinking of the SHOHO the Japanese withdrew the Port Moresby invasion force and its powerful covering forces.

Admiral Crace's Australian/American task force (including HMAS AUSTRALIA and HMAS HOBART) which had been detached to attack the Japanese Port Moresby Invasion force if it passed through the Jomard Passage into the Coral Sea suffered three air attacks. Firstly by 12 Japanese torpedo bombers, then by 19 high level bombers and finally by three US Army B-26 bombers from Townsville, which had mistaken the identity of the ships. With very skilful manoeuvring and anti-aircraft fire no ship was hit, although the heavy cruiser USS CHICAGO lost two sailors and had seven wounded. Five Japanese aircraft were shot down.

Vice Admiral Sir John (Jack) Crace

KBE, CB, RN – 1887-1968



Crace was born in Gungahlin, New South Wales (now in the Australian Capital Territory). The suburb of Crace in the ACT, is named after Crace's father, Edward Kendall Crace. John Gregory Crace (also known as Jack) was educated at The Kings School in Parramatta, before completing his schooling in the UK. In 1902 (aged 15), he enlisted in the Royal Navy and was posted to the training ship HMS BRITANNIA (before Britannia Royal Naval College was built). After being trained as a torpedo officer, Crace served on the battlecruiser HMAS AUSTRALIA throughout WWI. Travelling back and forth between the United Kingdom and Australia during the interwar years, he served in a series of sea and shore positions before being assigned command of the Australian Squadron in September 1939. Upon his arrival in Sydney, Crace grew increasingly dismayed at the state of the RAN Fleet and sought to resign his appointment and return to the UK and the European Theatre of War. This was declined and, after war with Japan broke out, Crace was appointed commander of the Allied Naval Squadron, ANZAC Force.

Following the Battle of the Coral Sea, Crace returned to Britain in June 1942 as Vice Admiral, commanding the Chatham Royal Navy Dockyard. He was placed on the retired list in 1945 (aged 58); remaining in command at Chatham until July 1946. He was appointed Knight Commander of the Order of the British Empire in 1947 and died in Hampshire, England in 1968.

Overall, though with the loss of USS LEXINGTON, a tanker and a destroyer, it could be said that the USN suffered a greater loss, the battle was a strategic victory. The Japanese suffered their first check of the war and never again attempted to enter the Coral Sea except with submarines and aircraft.

What followed is not well-known in Australia for the subsequent huge naval battles in the Solomons were not in General Douglas MacArthur's



HMAS AUSTRALIA and Task Group (TG) 17.3 under air attack on 7 May
(Australian War Memorials P02497.048)



IJN SHOKAKU, afire and turning at speed having suffered bomb strikes

Australian area of command and thus received comparatively light coverage in our media or in subsequent historical coverage.

So great were the naval casualties in these major battles (some of the greatest in WWII) that the sea area between the islands of the Solomons was re-named "Iron Bottom Sound". In the year-long struggle both sides lost some 28 major warships – aircraft-carriers, battleships, cruisers, destroyers and submarines – and many more were severely damaged. In all theatres worldwide in WWII the US Navy lost five of its largest aircraft carriers of which three were lost in the Solomons. Out of a total loss of 10 cruisers no less than eight were lost in the Solomons. The RAN lost the Heavy Cruiser HMAS CANBERRA. The Light Cruiser HMAS HOBART was torpedoed but survived. Some 100 RAN sailors were lost and many wounded. The New Zealand cruiser HMNZS LEANDER was also torpedoed but survived.

Starting with the Battle of the Coral Sea the battles in the Solomons, at Midway and the holding of the Coral Sea by our Australian/American Task Force assisted by the RAAF and the US Army Air Force, and the holding of Milne Bay were of the greatest importance in the Defence of Australia. These enabled the New Guinea campaign to take place followed by the allied advance northwards, the capture of islands bases, and the eventual assault on the Philippines.

LESSONS FORGOTTEN

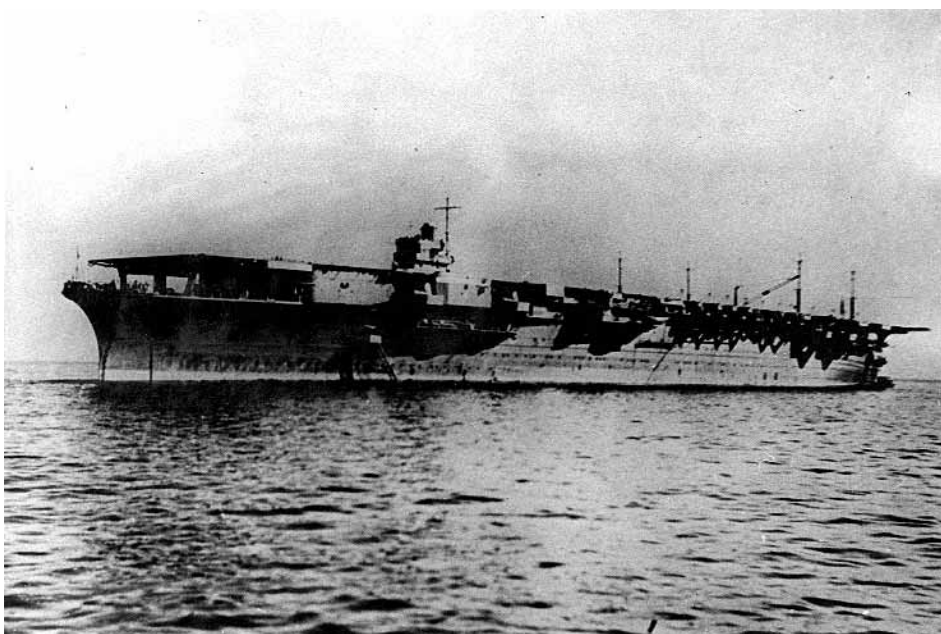
Whilst prognostications on the 'What-ifs' of war are always speculative and fraught with argument it is interesting to consider the possible situation had the Battle of the Coral Sea resulted in major defeat including the loss of both American aircraft-carriers. The Americans would then have had only two aircraft-carriers in the subsequent Battle of Midway against five or even six Japanese carriers. The East Coast of Australia would have been open to attack, not just by submarines, but by aircraft-carriers and battleships. Landings on our shores may even have occurred.

I was not present at the Battle but joined the flagship HMAS AUSTRALIA four months later just as the Japanese assault on Milne Bay was being defeated. One day while on patrol in the Coral Sea I was sent with an important message to Rear Admiral Sir Victor Crutchley VC DSC RN the Task Force commander who was in his secret Operations Room. I glanced at the chart showing estimated Japanese and Allied dispositions. I was horrified to see the huge Japanese Force including aircraft-carriers, battleships, heavy cruisers and submarines operating from Rabaul. I emerged from the room a very pale-faced Cadet Midshipman – thankful for the US Navy – for I was a poor swimmer.

There are important lessons for our nation flowing from the naval campaigns. It would certainly seem that Australia should again, as it did

for several decades after WWII, including when President Bush visited for the 50th anniversary, commemorate the Battle of the Coral Sea and the subsequent naval campaigns, – the real key to our defence in WWII.

The 75th Anniversary is not far off – a suitable occasion for a further Presidential visit and nation-wide commemorations.



IJN ZUIKAKU in 1941 – the heavy loss of her aircraft at the Battle of the Coral Sea meant that she was not in the Japanese order of battle for Midway

Note: This paper by Admiral Andrew Robertson AO DSC RAN (Rtd), an officer who fought in the Pacific Campaign and joined HMAS AUSTRALIA only months after the Battle of the Coral Sea, neatly bookends Gleiman and Deans paper on Amphibious Warfare, Past, Present and Future. The Navy League is indebted to Admiral Robertson for his leadership and advice on naval matters and to The Navy League over the best part of century – he is in all regards a National Treasure. ■

The Navy League is intent upon keeping before the Australian people the fact that we are a maritime nation and that a strong Navy and capable maritime industry are elements of our national wellbeing and vital to the freedom of Australia. The League seeks to promote Defence self reliance by actively supporting defence manufacturing, and the shipping and transport industries.

The strategic background to Australia's security is changing and in some respects has become less certain. The League believes that Australia should pursue the capability to defend itself, paying particular attention to maritime defence. Through geographical necessity Australia's prosperity, strength, and safety depend to a great extent upon the security of the surrounding seas and island areas, and on unrestricted seaborne trade.

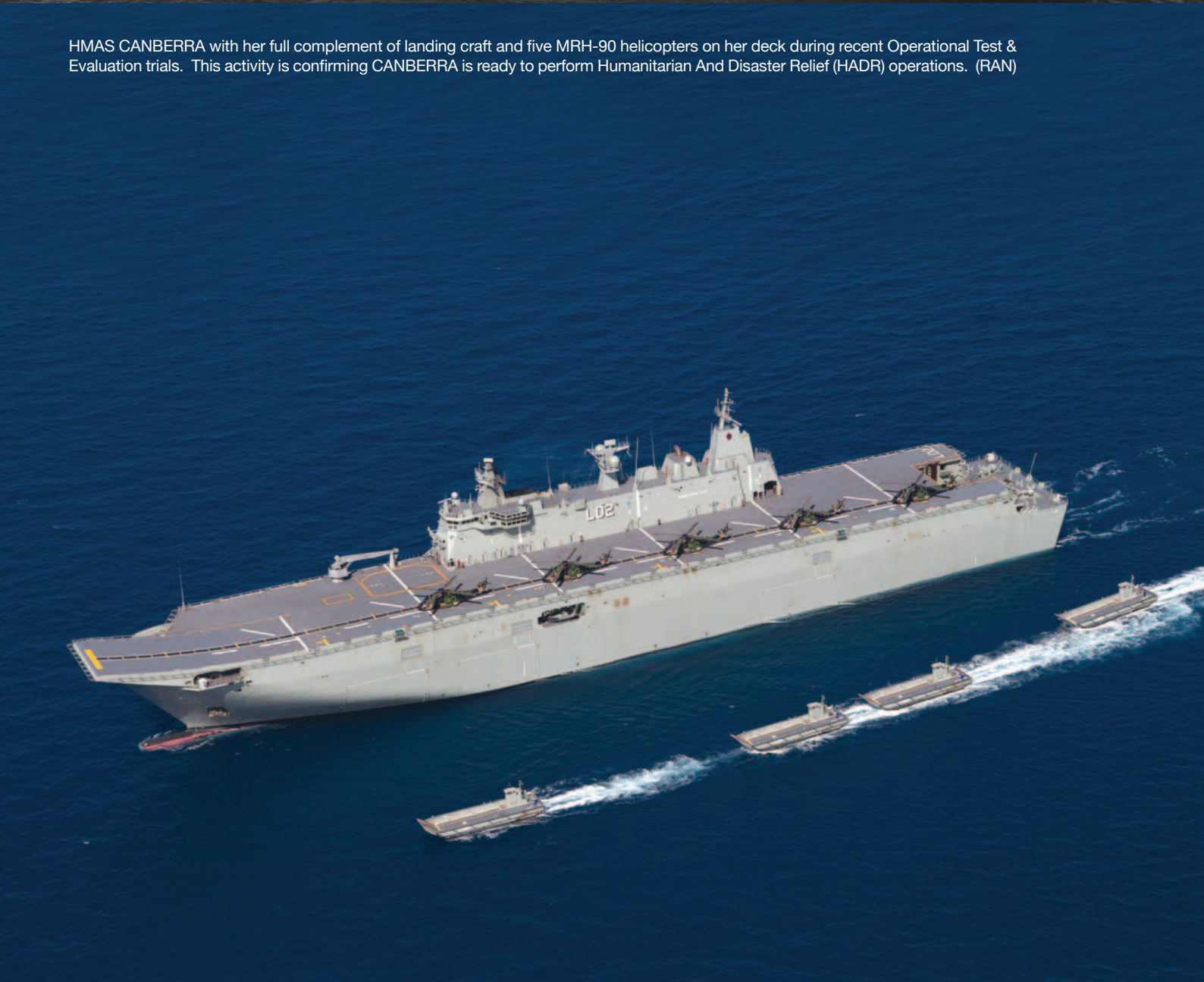
The Navy League:

- Believes Australia can be defended against attack by other than a 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 with our allies.
 - Supports a continuing strong alliance with the US.
 - Supports close relationships with all nations in our general area and particularly New Zealand, PNG and the island States of the South Pacific.
 - Advocates the acquisition of the most capable modern armaments, surveillance systems and sensors to ensure that the ADF maintains technological advantage over forces in our general area.
 - Advocates a significant deterrent element in ADF capability enabling powerful retaliation at significant distances from our shores.
 - Believes the ADF must be capable of protecting commercial shipping both within Australian waters and beyond, recognising that this means in conjunction with allies and economic partners.
 - Endorses the control of coastal surveillance by the ADF, and the development of the capability for the patrol and surveillance of all of Australia's ocean areas, its island territories and the Southern Ocean.
 - Welcomes Government initiatives concerning the recovery of an Australian commercial fleet capable of supporting the ADF and the carriage of essential cargoes to and from Australia in times of conflict.
- As to the RAN, the League,** while noting the vital national peacetime tasks conducted by Navy, 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 the east and west coasts simultaneously and advocates a gradual build-up of the fleet and its afloat support elements to ensure that, in conjunction with the RAAF, this can be sustained against any force which could be deployed in our general area.
 - Welcomes the announced increase in Defence expenditure to 2% of GDP over the next 10 years.
 - Believes that the level of both the offensive and defensive capabilities of the RAN should be increased and is concerned to see that the substantial surface and sub-surface capability enhancements contained in the 2009 Defence White Paper should survive the forthcoming 2015 Defence White Paper; in particular a substantially strengthened submarine force, 3 Air Warfare Destroyers (AWDs), 2 landing ships (LHDs), 8 new frigates (Anzac class replacements), 20 offshore combatant ships, 6 heavy landing craft and substantial numbers of naval combatant and ASW helicopters.
- Strongly supports the acquisition of large, long range and endurance, fast submarines and, noting the deterrent value, reliability and huge operational advantages of nuclear powered submarines and their value in training our anti-submarine forces, urges the consideration of nuclear power as an option for those vessels.
 - Notes the potential combat effectiveness of the STOVL version of the JSF and supports further examination of its application within the ADF.
 - In order to mitigate any industry capability gap following the completion of the AWD program, recommends bringing forward the start date of the planned future frigate (Anzac replacement) program, recognising the much enhanced capability projected for these ships.
 - Urges that decisions to enhance 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 be implemented.
 - Supports the development of Australia's defence industry, including strong research and design organisations capable of the construction and maintenance of all warships and support vessels in the Navy's order of battle, and recognises the fundamental importance of a stable and continuous shipbuilding program for the retention of design and building skills and the avoidance of costly start up overheads.
 - Supports the efforts by Navy to rebuild the engineering capability to ensure the effective maintenance and sustainability of the fleet.
 - Advocates the retention in preservation (maintained reserve) of operationally capable ships that are required to be paid off for resource or other economic reasons.
 - Supports a strong Naval Reserve and Australian Navy Cadets organisation.
 - Advocates a strong focus on conditions of service as an effective means of combating recruitment and retention difficulties.
- ## The League:
- Calls for a bipartisan political approach to national defence with a commitment to a steady long-term build-up in Australia's 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.



HMAS SYDNEY III (R17) in the troops and transport role during the Vietnam War (1965-1972) earning the nickname Vung Tau Ferry.

HMAS CANBERRA with her full complement of landing craft and five MRH-90 helicopters on her deck during recent Operational Test & Evaluation trials. This activity is confirming CANBERRA is ready to perform Humanitarian And Disaster Relief (HADR) operations. (RAN)





Passing the baton: HMAS CANBERRA (L02) Crews Ship to Farewell HMAS TOBRUK (L50) - a service well done; a commission honoured.