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THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

ADDING TO THE "KIT" OF AUSTRALIA'S BLUE WATER NAVY

THE 'VOODOO ECONOMICS' OF THE RAN

MUTUALLY ASSURED DRONE SWARM WARFARE

SEMPER FORTIS PRO PATRIA, NON SOLUM SIBI

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Front cover: HMAS ADELAIDE (L01) exits Sydney Harbour for Exercises HMAS ANZAC (FFG150) astern (Image SGT Christopher Dickson)

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A NET ASSESSMENT

The first issue of *The NAVY* in 2023 has at its core the intertwined subjects of Defence, politics, economics, security, drones, and loss. The picture painted is one of change, disruption, and uncertainty. Where a net assessment may not come down favourably on the Global West. Russia's war shows little sign of ending; China's transgressions in the South China Sea and against Taiwan continue, and Covid sputters on. The consequences of Covid adding significantly to inflation, exacerbated by global and local energy policies, green tape, and the dash for renewables. Not simply Russia's war against Ukraine.

In *The Voodoo Economics of Australian Defence*, Dr Baird gets at some of this when he comments, *inter alia*:

> …the current [Professors] Angus Houston/Stephen Smith *Defence Strategic Review*, unfortunately – thanks to their backgrounds, is highly unlikely to achieve that, [a completely new broom to Defence]. Inevitably, given the outcomes of a plethora of past such reviews, that is not really the government's intention for it. Rather than Houston and Smith, the RAN urgently needs a modern Samuel Pepys.

Neil concludes: "stripped of its fancy arcane terminology, economics is really very simple…eliminating the 'Canberra margin' alone would offer Australia vastly more bang for its bucks".

Long standing contributor, Captain George Galdorisi (USN, Ret) – *first prize, NLA essay professional entry* – takes forward the political, defence, security, economic, industry challenge in his paper *Adding to the "Kit" of Australia's Blue Water Navy*. George considers that "a large part of the impetus for [our] unprecedented naval building program is the fact that Australians live in a dangerous neighbourhood". Captain Galdorisi places emphasis on uncrewed maritime vessels (UMV) by asking the question: "how do Australia's expeditionary forces bring more *kit* to the fight"? He argues that the RAN should "watch how the US Navy evolves missions for its intended fleet of UMV and see how some of these lessons might lead to having these (relatively low-cost) assets add value to expeditionary forces, led by the *Canberra-class* amphibious ships". George concludes:

> While evolutionary in nature, this disruptive capability delivered using emerging technologies can provide the ADF and RAN with near-term solutions to vexing operational challenges, while demonstrating…that there is a way to add to the kit [and] make these naval formations more lethal and survivable. This will enable Australia to continue to provide for the defence of the nation, as well as the security and prosperity of the greater Indo-Pacific region, while dealing with the growing *pacing* threats in the region.

Jonathan Wilson – *first prize, essay non-professional entry* – builds on Captain Galdorisi's paper, from an Australian perspective. In *Mutually Assured Drone Swarm Warfare*, paper 3, Jonathan argues that "[AUKUS] promises nuclear attack submarines (SSNs) for the Royal Australian Navy (RAN). If Australia wants to maintain a networked and sophisticated force, the acquisition of Uncrewed Underwater Vessels (UUV) into the RAN and their pairing with multiple platforms is of equal importance". He concludes, inter alia:

> If the *Robotics, Autonomous Systems and Artificial Intelligence* (RAS-AI) *Strategy 2040* [1] is indicative of the RAN's classified plans for UUVs, then the document needs revision…If a future RAN task force faces superior enemy UUV swarms, the results may be more underwhelming than expected. The fleet may simply retreat to the safety of territorial waters, as the Argentine Navy did in 1982, while the Australian government sues for peace.

PLAN Sailor tracks ROCS LAN YANG (FFG 935) off Taiwan, Aug 2022

At short notice, Ed asked Dr Simon Reay Atkinson, a long-standing NLA contributing-member, to use his detailed experience leading get well and research programs in academe and in Defence (ADF, RAN and RN) – as Director and Principal Investigator (Associate Professor) – to consider the July 2020 fire aboard USS BONHOMME RICHARD (LHD 6). Simon takes both a traditional and forward-looking approach to the fire in his paper entitled: *Semper Fortis Pro Patria, Non Solum Sibi*. Dr Atkinson, essentially pulls together the previous three papers by arguing (I paraphrase) "that ship designs need to be fit for purpose; fitting crews to ships – rather than simply shipping the crews and fits". He suggests that the loss of USS BONHOMME RICHARD was due in large part to the political, economic, defence and security context that the 25-year-old ship found herself in, by 2020. Which prevented the effective and timely exercise of Command and Control. He comes up with some useful maxims, that may be worthy of further consideration:

- *If leaders don't lead; followers can't follow.*
- *Managers can't manage, unless leaders lead.*
- *without trust, no leadership*
- *without trust, no courage.*

Dr Atkinson also considers the essential rebuild of western navies. Drawing from USS BONHOMME RICHARD lessons, he suggests current ship designs and shipyards to be politically, militarily, and economically "unfit for purpose". He argues for new designs which, if the 455 (+) USN Fleet is to be realised, will need to include UMV and UUV. Something argued for in the first three papers.

FREEZES

A critical weakness with any review is that it artificially freezes an organisation at a moment in time – preventing any further change while it is undertaken. Yet "time and tide wait for no sailor". Reviews also assume that other organisations and competition stands still. Ignoring the old adage that "the enemy will always have a say".

China has fully Militarised Fiery Cross (and Mischief) Reef, March 2022 (Image Peoples Daily).

Battle of the Coral Sea (Rear Admiral Andrew Robertson RAN (2015) *We Will Remember The NAVY* Issue 4 Oct-Dec). The Battle Area: Action (1), 4 May 1942; Actions (2) and (3), 7 May and Action (4), 8 May (Main Battle).

Questions have also been raised about the standing and bias of Smith and Houston. Including in paper 1. After many previous such "reviews", APS and sailors may have already concluded that it will be "yet more for less". False optimisation, where the less is always at the expense of sailors and APS. Not the accountancy consultancies noted in paper 4. Which also indicates there are 2 consultants for every [Defence] public servant: "raising the question of value for money; supported versus supporting; and insourcing versus outsourcing…" See also [2,3]

There are also worrying lock-ins, such as Enterprise Resource Planning (ERP), which artificially freezes the ADF "program" to deliver a global accounting, software, business regime – based upon its own "perfect" model. ERP, while creating huge costs (already consuming 1000s of Defence personnel), justifies itself against claimed efficiencies. Software models of this type *rarely if ever* deliver on the claims. They also prevent change, exactly by assuming *apriori* perfection. ERP is antithetical to the changes necessary for urgent new designs and realising *Defence Strategic Review* outcomes.

ASSESSMENT

While there have been welcome geostrategic advances, including AUKUS and the QUAD – none has yet delivered an earlier submarine or frigate. The USN has not settled on future fleet numbers and its current submarine build program has little additional capacity. Suggestions that Japan should join AUKUS (AUKJUS?) make absolute sense. Noting also excellent submarines (ships and aircraft) designs built by Japan – which also has some capacity.

Regionally, the continued value and purpose of ANZUS and New Zealand membership of Five-Eyes remains questionable. No serious observer is suggesting New Zealand should belong to AUKUS, or the QUAD – not simply because of what but who they would, or would not, bring to the party.

Questions regarding Guadalcanal (now in the Solomon Islands (SI)) represent an existential threat. Over 7000 US and Allied (and 19,000 Japanese) service personnel were killed retaking the island during WW2. The *Battle for Australia – the Battle for the Coral Sea* – was fought precisely so as to retain vital Australian sea lines of communication, through the Solomon Islands and prevent attack on the mainland. It beggars' belief that the SI PM, Manasseh Sogavare, and his unpopular, democratically deficient Government, is treating his own people and long standing allies (the US, Australia and Japan) in this way. See also Letters. The question of Taiwan remains open, with Xi indicating "resolution" well before 2027.

A net assessment might conclude that Australia and the Global West is possibly less able to deter in January 2023, than it was in January 2018. Which means, given China continues to build its fleets and influence across the globe – that, relatively, the West is politically, economically, and militarily going backwards. Never the best means of Defence or Deterrence. ■

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STATEMENT OF POLICY

CURRENT AS AT 1 JANUARY 2023

For the maintenance of the Maritime wellbeing of the nation.

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, research, cyberspace, shipping, transport and other relevant industries.

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 strategic background to Australia's security is changing and in many respects has become much less certain following increasing tensions, particularly in East Asia involving major powers, and in Europe and the Middle East. The League believes that Australia should rapidly increase the capability to defend itself, paying particular attention to maritime defence.

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 particularly New Zealand, PNG and the South Pacific island States.
- Advocates the acquisition of the most capable modern armaments, surveillance systems and sensors to ensure technological advantage over forces in our general area.
- Advocates a strong deterrent element in the ADF 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, in conjunction with allies.
- Endorses the development of the capability for the patrol and surveillance of all of Australia's ocean areas, its island territories and the Southern Ocean.
- Advocates Government initiatives for rebuilding an Australian commercial fleet capable of supporting the ADF and the carriage of essential cargoes to and from Australia in times of conflict.
- Notes the Government intention to increase maritime preparedness and gradually increase defence expenditure to 2% of GDP, while recommending that this target should be increased to 3%.
- Urges the strength and capabilities of the Army (including particularly the Army Reserve) and Air Force be enhanced, and the weaponry, intelligence, surveillance, reconnaissance, cyberspace and electronic capabilities of the ADF be increased, including an expansion in its UAV capability.

As to the RAN, the League, while noting 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 maintenance of a Navy capable of effective action in hostilities and advocates a 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 area of strategic interest.
- Considers that the level of both the offensive and defensive capabilities of the RAN should be strengthened, in particular with a further increase in the number of new proposed replacement frigates and offshore patrol vessels, noting the need to ensure essential fuel and other supplies, and the many other essential maritime tasks.
- Recommends bringing forward the start date of the replac ement frigate program to both strengthen the RAN and mitigate the local industry capability gap.
- Recommends the timely replacement and increase in numbers of the current mine-countermeasure force.
- Strongly supports the early acquisition of large, long range and endurance, fast submarines and notes the deterrent value, reliability and huge operational advantages of nuclear powered submarines and their value in training anti-submarine forces.
- The League is concerned at the very long time before the projected 12 new conventional submarines can enter operational service, noting very serious tensions in the NW Pacific involving major maritime powers.
- Recommends very early action to provide a submarine base on the Eastern seaboard.
- Notes the potential combat effectiveness and flexibility of the STOVL version of the Joint Strike Fighter (F35 *Lightning II*) and supports further examination of its application within the ADF.
- Supports the development of Australia's defence industry, including strong research and design organisations capable of the construction and maintenance of all warships, submarines and support vessels in the Navy's order of battle, and welcomes the Government decision to provide a stable and continuous shipbuilding program.
- Advocates the retention in maintained reserve of operationally capable ships that are required to be paid off for resource or other economic reasons.
- Supports a strong and identifiable Naval Reserve and Australian Navy Cadets organisation.
- Advocates urgent Government research and action to remedy the reported serious naval recruiting and retention problem.

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.
- Believes that, given leadership by successive governments, Australia can defend itself in the longer term, within acceptable financial, economic and manpower parameters.

Welcome to another great edition of *'The NAVY – the Magazine of the Navy League of Australia'* and another year for the League to continue its important work. Here's hoping the year is off to a great start for you all.

The Immortal Memory: the death of Admiral Lord Horatio Nelson RN, 21 October 1805 (image NMM).

The Immortal Factor - Australian Navy Cadets on board HMAS CANBERRA (L02) Fremantle (image SGT Ben Dempster).

THE NAVY LEAGUE FEDERAL COUNCIL AND AGM

In October last year we were able to hold our Annual Conference in person for the first time in three years. While we had managed to get together *virtually* over the past couple of years with videoconferencing it was great to be back into the same room with our colleagues from across the nation to enjoy not only the business of the League but also some conviviality and collegiality. I know I had missed the opportunity to catch up in person, and others said the same to me, so it was great to be back together again after such a long time.

Much business was conducted in Canberra over the weekend of 21-23 October. Events included the League's first official toast to His Majesty the King of Australia and toasting the immortal memory of Admiral Nelson. Both of these toasts were done in fine style at a formal dinner to mark the occasion of our Federal Council and Annual General Meeting as well as acknowledging Nelson's great victory at Trafalgar and the seamless transition of the King to the role as our Head of State.

While in Canberra we were joined by Navy League colleagues as well as representatives of the Navy and the Federal Parliament. We received a briefing from Commodore David Greaves RAN, the Director General Australian Navy Cadets, which brought our members up to speed with many issues affecting cadets and the broader Navy which was very well received by those who were in attendance. We also received a brief from Senator Jim Molan AO DSC, who provided a view from the Senate on the emerging strategic issues in the region, and their impacts on our Navy and the broader Australian Defence Force. Both guests made a sterling contribution to the success of our meeting and our members were very grateful to have such high calibre speakers join us once again.

The Federal Council also received reports from each of the State Divisions of the Navy League, as well as from our New Zealand counterpart Bill Dobbie who we were grateful to see after such a long time. The Divisions really are the heart and soul of the League and it was quite impressive to hear how much is being done by the Executive of each Division and our members, all of whom are volunteers, to advance the interests of the League and in support of our objects. Well done to you all and I encourage you to keep up the great work this year.

Other reports included updates on membership, finances and this, *The NAVY* magazine, as well as the League's website, properties and our *Statement of Policy*. I encourage you all to re-read the Statement of Policy, it should guide all that we do, and be sure to let us have your views on what we should do to ensure it remains relevant to our emerging national and international strategic environment. Your opinions and input are vital to shaping our future and the future security of the nation.

Importantly, we also settled on our meeting dates for 2023, so if you are planning ahead, please set aside the weekend of 20-22 October 2023 in your calendar to be in Canberra for the 2023 Annual Conference. We look forward to seeing many of you there this year.

THE NAVY LEAGUE OF AUSTRALIA ANNUAL MARITIME AFFAIRS ESSAY COMPETITION

During the Federal Council meeting, the recommendations of our Essay Competition committee were received regarding the entries to the 2022 Maritime Affairs Essay Competition. The entries were again of a most commendable standard and winning entrants will be published in *The NAVY* over the coming editions.

Each year prizes are awarded in the professional and non-professional categories with the chance to have the papers published in *The NAVY* as well as prize money awarded to the winning entrants. If you are inclined to contribute an entry I encourage you to get writing now for the 2023 competition. The professional category is open to journalists, Defence officials, academics, Navy personnel and previous contributors to *The NAVY* with the balance of entrants being judged in the non-professional category.

After some considerable deliberation the competition winners were announced at the Federal Council meeting and our congratulations go out to those who have been rewarded with a prize as well as to

all who made the effort to contribute. Well done to you all for a high standard of entries and for your ongoing interest and efforts in keeping before the Australian people that we are a maritime nation and that a strong Navy and capable maritime industry are elements of our national wellbeing and vital to our freedom.

In the professional category, our congratulations go to first prize winner Captain George Galdorosi USN (Retd) for his paper *'Adding to the "Kit" of Australia's Blue Water NAVY'*. More on that below. Second prize in the professional category is awarded to Greg Swinden, for his work *'Back to the Future – The Need to Create an RAFA'*. Congratulations Greg. Congratulations also go out to Kelvin Curnow for his paper *'The Royal Australian Navy Current Status and Future Prospects'* which is a great read which you can look forward to seeing it in a future edition of *The NAVY* magazine. Well done all.

In the non-professional category the paper *'Mutually Assured Drone Swarm Warfare'* by Jonathan Wilson took out first prize and you can read that article in this edition of the magazine. Second prize was awarded to Geoff Hawkins for his paper *'Recruitment'* which I encourage you to keep an eye out for. It is an engaging read. Murray Dear, our friend from across the ditch took out third prize for his article *'Contest for the Southern Ocean'* which I'm sure will also draw much interest from readers of the future editions of *The Navy*.

IN THIS EDITION

I am confident that you will enjoy the reading we have in store for you in this edition of *The NAVY* magazine. In addition to the prize-winning articles from George Galdorosi, regarding USVs for the RAN from the US experience and Jonathan Wilson which builds on Captain Galdorosi's paper from an Australian perspective, there is much more for you to read. Dr Neil Baird has contributed what might be considered some magic or religion or a little of both in his article *'The Voodoo Economics of Australian Defence'* which is likely to intrigue many of you with Neil's view of the local approach. Complementary to Neil's paper is Dr Simon Reay Atkinson's paper *'Semper Fortis Pro Patria, Non Solum Sibi'*. For those schooled after Latin fell off the curriculum, rest assured that the bulk of the article is written in English, so you may be educated, if not in Latin, in the lessons learnt from the recently released report and findings into the catastrophic fire onboard USS BONHOMME RICHARD.

BEST REGARDS FOR THE YEAR AHEAD – MAY IT BE YOUR BEST ONE YET!

I hope you have all enjoyed a restful Christmas and New Year break, that 2023 is your best year yet, and encourage you to continue to contribute to this, your Navy Magazine, in 2023. Remember, we welcome your input, whether in article form, a letter to the editor or simply sending us an email. Please also encourage your friends to sign up as members and if you are thinking of a great gift idea, a subscription to *The NAVY* magazine could be just the ticket.

Happy reading and best wishes for a fruitful year ahead. ■

HMAS PERTH (I) MEMORIAL

The first stage of the HMAS Perth (I) Memorial was completed today with the installation of a half-size replica of a propeller as mounted on the ill-fated HMAS PERTH (I) which was sunk in March 1942.

This phase of the memorial includes a Wall of Remembrance which has the names of all those who were on the HMAS PERTH (I) when she was overcome by a superior Japanese naval force at the *Battle of Sunda Strait*. The USS HOUSTON was also sunk with great loss of life in the same battle.

The propeller was modelled on a Royal Navy Admiralty 1930s design, cast, and machined by Veem Ltd, Canning Vale.

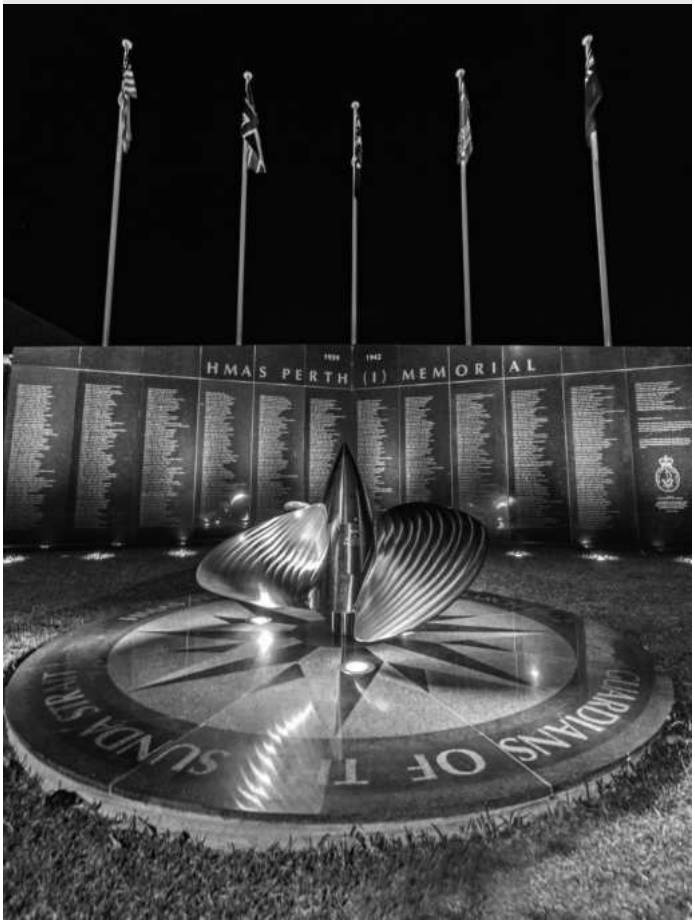
The Memorial is the result of work carried out by the Navy League (WA Div.) and the HMAS PERTH (I) Memorial Foundation Inc.

It is hoped to complete the second stage by mid-2023.

The memorial was designed by Smith's Sculptures who were also responsible for the HMAS SYDNEY memorial in Geraldton.

Mike Bailey, the Chair of the HMAS Perth (I) Memorial Foundation Inc (supported by the NLA WA Div.), stated:

> After many years of dedicated work by volunteers from the HMAS PERTH (I) Memorial Foundation and the Navy League (WA Div.), the first stage of the Memorial has now been completed. It is a fitting reminder of the sacrifice made by the officers and crew of that fine Royal Australian Ship in World War 2.



HMAS PERTH (1) Memorial with 1930 Navy Admiralty Patent Propellor and Memorial Wall.

Hi Aeneas,

I noted with interest in the article by Mark Schweikert entitled *"Make Ready In All Respects"* in Volume 84 No 4 of *The NAVY* that the government of the Solomon Islands has inferred to their counterparts here in Australia that they would not allow a foreign naval base to be established in their sovereign territory. I just hope that our politicians are fully aware of the Chinese Communist Party's (CCP) control over that country's one-party government and every aspect of its society.

Just because the Peoples' Liberation Army – Navy (PLA-N) is prohibited from establishing a naval base in another country means little if other components under its control can.

The Australian Government needs to be cognisant of the fact that the PLA-N also has control over other bodies such as the China Coast Guard, China Fisheries Law Enforcement Command, China Marine Surveillance, People's Armed Forces Maritime Militia and General Administration of Customs as well as having significant influence over the nation's vast commercial fishing fleet (+25,000 vessels of over 100 tonnes). Thus, the PLA-N has many de facto methods of achieving its influence as has been seen in the South China Sea ever since the end of the Vietnam War as China commenced its territorial advances across the Pacific.

We have already seen members of the China Armed Police training members of the Royal Solomon Islands Police Force (RSIPF) in Crowd Control and it's also been reported that personnel from the RSIPF have gone to China for additional training so it should come as no surprise to our politicians when a major fisheries base is established in our neighbourhood.

Let's also hope that the mainstream Australian media is also aware of this not to subtle situation and reports to the population accordingly.

Keep up the good work and kind regards,

Jon D

NSW

By Editor,

Dear Jon,

Thank you and also for being a longstanding member of the NLA and contributor.

The concerns expressed by you in your kind letter have been passed on to Mr Mark Schweikert and I know are shared by him and Senator Jim Molan. Jim and Mark both presented on similar themes at the recent NLA AGM, held in Canberra last October. Themes that are also taken up in three of the four papers in this issue, and in the editorial.

Jim, as you may be aware, has not been well these past few months. I am sure you share with us all our best wishes for a full recovery. We need voices such as Senator Molan's at this critical time.

Please continue to raise with your elected representatives and, if I may ask, in papers for *The NAVY*, the Journal of the Navy League of Australia.

Kind regards
Aeneas

ROYAL CYPHER

A number of readers from across the political spectrum shared with editor sadness at the death of Her Majesty the Queen and commentary on the future choice of crowns, to be worn on uniforms of His Majesty's Defence Forces.

His Majesty King Charles has chosen the Tudor Crown as his England, Wales and Northern Ireland (as opposed to Scottish, which has the crown of Scotland) Royal Cypher, with the Kings initial C. In the English and Scottish variant, the King's initial "C" is intertwined with the letter "R" for Rex, with "III" denoting Charles III. Since Charles is the third King Charles of England and Scotland. Whereas, Her Late Majesty was Queen Elizabeth the Second of England and Queen Elizabeth the First, of Scotland.

The Queen's Australian Royal Cypher (1962) represented St Edward's Crown, with the Queen's initial "E", not intertwined with the letter R (for Regina) or "II", since Her Majesty was Queen Elizabeth the First of Australia. It seems likely, therefore, that His Majesty's Australian Royal Cypher will be the Tudor Crown over the Letter "C".

Without wishing to be accused of *lèse-majesté*, King Charles's Australian Royal Cypher, may look similar to Her Late Majesty's Australian Cypher (as it appears in Her Australian Royal Standard – along with the flags of the six states, but not ACT or NT).

Republic or Constitutional Monarchy remains a burning issue for the inner city-political elites – not necessarily the rest of Australia. For the time being, the Governor General, as the King's Vice Regal representative, remains the ADF Commander in Chief. As long as that remains the case, the Crowns in the uniforms of the Royal Australian Navy, the Royal Australian Air Force, and the Royal Australian Regiment (and Army) will all change, over a period of time. Likely to be continued under a future King William.

A question arising and asked under previous correspondence is "the role of Australian Defence Vessels and their right to wear *His Majesty's* Australian White Ensign?" Despite probing, both Defence and Navy have been unforthcoming on this issue. Will HMAS be ADV in a future republic? It appears cumbersome and ugly to those who have served and are serving.

THE 'VOODOO ECONOMICS' OF THE RAN

By Dr Neil Baird

While navies can never be managed on purely commercial lines, they would benefit considerably from a far more commercial approach, particularly with respect to personnel and acquisition management. The economics of the Royal Australian Navy have traditionally been severely handicapped by political, cultural, and bureaucratic restraints. Combined, they cause massive waste of time and treasure. Australia cannot afford either, especially in the current time of considerable strategic tension. There must be a better way.

INTRODUCTION

The personnel or crewing problems and some suggested practical solutions to them are described elsewhere in this article. Suffice to say that, as with vessel, supplies and equipment acquisition, massive wastes of time and treasure are features of current personnel arrangements. The ratio of 'suits' to 'uniforms', for example, is dangerously disproportionate. Australian Defence, particularly Navy, urgently requires a much greater proportion of uniformed personnel to public servants and 'consultants' than is the current reality. The over use of consultants verges on the obscene. It also urgently needs a far greater number of reservists with practical marine experience. The yachtsman officer scheme of World War II is still an excellent model, despite the regular Navy's ridiculing of it.

With the threat of an ever more belligerent China looming over the Indo-Pacific region, there is considerable talk currently of boosting Australia's defences, mostly by the simple and obvious expedient of spending more money. A Defence budget of 50% more than the current two per cent of Gross Domestic Product is frequently suggested. That is an increase in annual Defence expenditure of about $25 billion from its roughly $50 billion currently.

However, unless present Defence management and procurement practices are drastically improved, such an increase to $75 billion per annum would very likely be mostly wasted, hence the use here of the term 'Voodoo Economics' [1] Described in www.investopedia.com as having been coined by former US President George H. W. Bush, in reference to 'Reaganomics', as "An economic policy perceived as being unrealistic and ill-advised". That, sadly, seems to be the norm with respect to Defence generally and Navy in particular.

WARFARE, NOT WELFARE

As frequently criticised by the author, and other commentators such as Robert Gottliebsen and Greg Sheridan, for being far more focused on welfare than warfare over recent decades, Australian Defence personnel and procurement policies and procedures have become unrealistically aimed at relieving perceived social problems rather than at building an effective Defence force [2]. The ill-advised and enormously wasteful support of ASC in Adelaide is the ultimate example. After more than thirty years of staggering cost overruns, blatant incompetence and very lengthy delays, any rational observer cannot imagine why, except because of misguided or malign political pressure, Defence persists with the place. We certainly don't need Albert Einstein to define such persistence as insanity.

NUSHIP ARAFURA (OPV 203) at Naming Ceremony Dec 21 (Image LAC Stewart Gould).

Such blatantly wasteful sheltered workshops are completely unaffordable in the current dire economic and strategic situations. It is high time Australia took a completely new broom to Defence, not just Navy. Every aspect of its conduct needs thorough analysis and, most likely complete and comprehensive reform. Its culture is dangerously and wastefully wrong. The current Angus Houston/ StephenSmith Defence Strategic Review, unfortunately, thanks to their backgrounds, is highly unlikely to achieve that [3]. Inevitably, given the outcomes of a plethora of past such reviews, that is not really the government's intention for it. Rather than Houston and Smith, the RAN urgently needs a modern Samuel Pepys.

It is not, however, difficult for any interested economically and politically literate observer to discern the reasons for the frightening problems that currently beset Defence generally and Navy in particular. Starting with the above-mentioned focus on welfare rather than warfare, it proceeds through all the usual political/ bureaucratic obstacles that handicap most western democratic governments.

Indeed, the sad Naval performance record can clearly be seen by studying the cost and delivery time overruns, not to mention the capability deficiencies of the large majority of HMA ships delivered since 1945. That catalogue of horrors will be published shortly in this author's *Australia and the Sea: An Encyclopaedic Maritime History* [4].


HMAS CANBERRA (L02) Berthing at Fleet Base West, Mar 2019 (Image LSIS Richard Cordell).

Australian Defence Vessel (not HMAS) *Reliant* at its Flag Raising Ceremony Brisbane Aug 22 (Image SGT Ben Dempster).

Suffice to say, the truly successful naval ship building projects can be counted on fewer than the fingers of one hand. The failures and disasters require all the fingers and toes of two hands and two feet, at least.

GOLD PLATING

'Gold plating' of everything purchased by government is the norm in Naval acquisition processes. That approach ensures that only the perceived biggest, best and most expensive option will do. Cost-effectiveness is rarely, if ever, a real factor in Naval acquisition decision-making. No one ever seems to look around to see if a Toyota would do when it has been determined that a Mercedes is essential for our precious sailors. Canberra, sadly, seems to be completely incapable of rational cost/benefit analysis. Nor, it seems, is it interested in learning how to make such analyses.

Indeed, one former leading Australian ship builder with Defence experience once confided to one author that: "No one should ever underestimate the importance of frequent flyer points in Naval acquisition decision making". That illustrates a small but important part of the problem.

Hopefully, another oft-quoted anecdote is not really true. That is that ship designs are chosen on the size and comforts of their wardrooms.

TOO FEW EGGS IN TOO FEW BASKETS

'Too few eggs in too few baskets' is another rarely relieved norm. Closely related to the insistence on 'gold plating', and despite the very clear lessons that should be drawn from the rapid loss of half the RAN's cruiser fleet in World War II, for example, Defence persists with its seriously discredited 'bigger and more expensive is better' approach. Surely, our naval leaders, even the bureaucratic ones, have read some military and naval history where the advantages of 'more eggs in more baskets' have so often been shown. 'Concentration or focus of force' is all very well when you possess massive force. When you don't, though, as Australia clearly doesn't, then…

One can only hope that the current largely successful response to the Russian invasion of Ukraine is causing some re-thinking in the Russell Offices. Smaller defence forces have to be clever and innovative. Clearly, at present, Australia is neither.

MORE BANG FOR THE BUCK

'More bang for the buck' seems to be an incomprehensible, or at least irrelevant, concept in current Naval leadership minds. Indeed, on some recent vessels such as the LHDs and OPVs, very little bang is evident at all. They are grossly under armed to the point of practical defencelessness. What is the point of them as warships?

Australia needs fewer large, easily targeted and very expensive ships and many more smaller, faster, better armed, 'small target vessels'. In other words, many more corvettes, drones and OPBs and fewer pseudo aircraft carriers and cruiser-sized destroyers should be purchased. You can buy many times the number of smaller targets for the price of one large one. Even better, they can be built faster and locally with a much higher proportion of local content. Submarine and large steel ship construction should not even be attempted in Australia. There are plenty of competent and competitive builders of such ships elsewhere, when we really need them.

VALUE FOR MONEY

'Value for money' is a concept that is apparently generally ignored in Canberra. The, 'it's not their money', syndrome. The recent purchase of the grossly overpriced offshore service vessel (OSV) *ADV Reliant* (Where on earth did they find that embarrassing name?) is an egregious recent example [5]. This complex offshore construction vessel (Wrongly described as a 'platform support vessel') was purchased for a reported A$ 93 million. Thanks to the recent serious downturn in the offshore market, very similar vessels were selling contemporarily for around a quarter of that price. As usual, the sharp shipbrokers in Europe saw the Australian government coming!

While it is, ostensibly, to be Brisbane based with the laudable objective of being readily available for disaster relief in the Pacific islands, *Reliant* seems little suited to that role. It is comparatively deep-draughted and slow. Worse, it is reported that it will require extensive and, inevitably, very expensive modification to suit the RAN's not necessarily rational or logical requirements. In other words, it will take a long time getting to the scene of any disaster and will be unable to go practically alongside in many places.

In the same article revealing the purchase in *Australian Defence Magazine*, Bret Clark, the CEO of the Australian Industry and Defence Network, is quoted describing the purchase as "incredibly disappointing". Similarly, former naval officer and public servant, Bob Moyse, condemned the purchase in an ASPI *Strategist* article in May 2022 [6].

The budget for this Pacific Support Ship is believed to have been A$193 million, although, as always, it is difficult to discover an accurate 'real world' price. For that kind of money, even allowing for a 'Canberra margin' of 80-100% above the standard commercial price, a fast, modern, multi-purpose catamaran of around 100 metres LOA could have been built locally by either Austal or Incat to Navy's specific requirements [7]. Its speed would be triple that of the *Reliant* and its draught about half. Meanwhile, its practical carrying capacity would be much greater.

Incat Hull 097 *Santa Monica* operated by Seaworld Express.

Austal Hull 394 *Bajamar Express* Launch.

THE 'CANBERRA MARGIN'

The 'Canberra margin', by the way, can be defined as the allowance for extra cost to a builder of supplier of dealing with the Australian government rather than with a commercial customer. It is largely caused by senseless procedures, thoughtless 'variations', and completely unnecessary interference and 'second guessing' in construction projects.

Meanwhile, much the same criticisms apply to the unrealistic and ill-advised decision to proceed with the purchase of the RAN's landing helicopter dock (LHD) ships of the *Canberra-class*. These complex, large and very expensive ships have proved to be very much in the same 'white elephant' class as the Navy's very deservedly notorious *Collins-class* submarines. While not as slow as the *Reliant*, they have an even deeper draft. Even worse, they have proved to be unreliable and prone to machinery breakdown. They are ridiculously underarmed and their construction process, which was promised to include considerable local content, was something of a 'con job'. Very little of that promise was honoured.

While Defence's costing processes are opaque, to put it mildly, its original 2007 announcements claimed a price of around A$1.5 billion per ship for the LHDs. That would equate to at least A$2 billion per ship when they were delivered ten years later. Even allowing 80 to 100% for a 'Canberra margin', that price of A$4 billion for two ships, would have paid for at least twenty of Austal or Incat's fast, well-proven, shallow draft and reliable vessels. (And, despite what some in Navy claim, the Austal and Incat vessels can handle Abrams tanks).The bulk of that expenditure would have been made in Australia and the inevitably substantial 'frequent flyer points' influence largely eliminated.

The ominously faltering *Hunter-class* frigate project is another similarly egregious example of RAN procurement gone completely wrong. For the ever-increasing cost of those ill-conceived 'big target' ships, a considerable fleet of well-armed corvettes along with supporting drones could be built. Further, they could very largely be designed and built locally. Rob Bourke in his ASPI *Strategic Insights* comments in August 2022 commented very rationally and logically on the already ridiculous wastefulness of that frigate purchase long before it has really got under way [8].

LOCAL CONTENT

'Local content' is another grossly misused term in defence acquisition. It is almost always promised to accompany shipbuilding projects but, in reality, those promises are rarely honoured more than partially. The *Attack-class* submarines and *Canberra-class* LHD projects are very obvious recent examples of such failures.

WHY ARE SUCH INCOMPREHENSIBLE DECISIONS MADE?

Where, how and, most importantly, WHY are such incomprehensible decisions made? Shipbuilding contracts have evolved over considerably more than two millennia. They are very largely successful and problem free in the commercial sphere. What is wrong with Naval processes? Why can't Navy do likewise? Why cannot

Hunter-class Frigate Design (Image Navy).

Defence simplify, clarify and improve its acquisition processes generally and overcome its tendency, when in doubt, to resort to obfuscation and the backside covering use of expensive consultants? Australian taxpayers, after all, are paying for the outcome of those decisions. The current very wasteful approach is not working. It must be completely reformed. The 'Voodoo Economics' practiced by Defence must be eliminated.

POSSIBLE IMPROVEMENTS

Defence should do the fighting and leave the procuring to a more competent organisation, perhaps akin to the Productivity Commission. The admirals, air-marshals and generals should only have to convince the cabinet and, thence, parliament of their requirements and then leave the purchase of them to specialists with no further interference from any serving officers and no political axes to grind. That interference is the greatest cause of cost and time excesses. It causes massive waste and dramatically lessens Australia's defensive capabilities. Expensive consultants are most definitely not required to hold the admirals' hands or to cover their tails.

Those requirements should be stated as simply, clearly and obfuscation-free as possible. Once the decision to purchase has been made by parliament, there should be no further involvement by Defence personnel. At the same time, Parliament should be required to make purchasing decisions on the basis of value for money, not political expediency. The whole defence procurement process needs root and branch overhaul and rational new regulations to ensure that economically appropriate processes are implemented and maintained.

Stripped of its fancy arcane terminology, economics is really very simple. The RAN could significantly improve its economics by taking a simpler, more practical and straightforward approach to its expenditure. It could learn a great deal from any high school home economics teacher. Eliminating the 'Canberra margin' alone would offer Australia vastly more bang for its bucks. ■

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ADDING TO THE "KIT" OF AUSTRALIA'S BLUE WATER NAVY

By Captain George Galdorisi, USN (Ret.)

For well over a century, Australia has played an important role in ensuring the security and prosperity of the Indo-Pacific region. That role has grown in importance as regional tensions continue to simmer and as Australia has embarked on its most substantial naval building program in generations. A large part of the impetus for this unprecedented naval building program is the fact that Australians live in a dangerous neighbourhood.

INTRODUCTION

The Indo-Asia-Pacific region, while relatively peaceful at the moment, is rife with tension. This region is home to seven of the ten largest standing militaries (China, the United States, Russia, India, North Korea, South Korea, and Vietnam), and includes several nuclear powers. Territorial disputes in the Indo-Asia-Pacific have already spilled over into confrontation and conflict.

Australia now has what is arguably the most modern naval fleet in the region with several classes of new ships already in the water and more on the way. The nation is also increasingly connected with other countries in the region, via such initiatives as the QUAD (Australia, India, Japan and the United States) and AUKUS (Australia, the United Kingdom and the United States) among the most prominent.

As a nation that faces three great oceans, and placed in a region that is decidedly maritime, the face of the Australian Defence Force throughout the Indo-Pacific (and beyond) is the Royal Australian Navy. As the navies in the region continue to grow and modernize, there is a well-developed network between and among these navies to trade best-practices, especially in how they leverage advances in emerging military technology.

One regional technology development of note that the ADF and RAN are watching with great interest is the U.S. Navy Chief of Naval Operations initiative to grow the size of the U.S. Navy Fleet (which currently fields around 285 ships) into a "500-Ship Navy" with 350 crewed ships and 150 large uncrewed vessels. While details are still emerging as to just how these uncrewed vessels might be used by any navy, watching how this evolves for the U.S. Navy may well offer the RAN the ability to enhance its capabilities at relatively low cost.

AMPHIBIOUS FORCES IN THE INDO-PACIFIC REGION

Due to the "Swiss Army Knife" nature of what they bring to naval operations, amphibious forces are key assets—and can be game-changers—in the region. As reported previously in the pages of *The NAVY*, Australia's commitment to build and field world-class, state-of-the-art large amphibious ships has provided a means for Australia to make major contributions to the security and prosperity of the region.

One need only review Australia's history of amphibious operations—dating back to World War II – and accelerating in the 21st Century, to understand why the ADF and RAN are giving increased emphasis to sustaining and growing its amphibious capability. This is manifested in the RAN's two *Canberra-class* amphibious ships—HMAS CANBERRA and HMAS ADELAIDE. These two vessels, along with their escort ships and embarked ADF troops, provide Australia with the capability and capacity to conduct long-range amphibious operations.

While the attributes of the *Canberra-class* amphibious ships have been covered in the pages of *The NAVY*, as well as in other professional journals, it is worth reviewing what these ships bring to the fight. The *Canberra-class* Landing Helicopter Dock (LHD) displaces 27,500 tons, has a length of 230 meters, a beam of 32 meters, and a draft of seven meters. The ship can travel up to 20 knots and has a range of 9,000 nautical miles at its cruise speed of 15 knots. Manned by approximately 340 RAN sailors, the *Canberra-class* can embark over 1,000 troops, carry 18 helicopters and over 100 vehicles.

While these statistics – especially the length and beam of the *Canberra-class* amphibious ships are impressive – they only tell part of the story. My professional experience as a naval officer includes three tours of duty in the U.S. Navy's amphibious forces: a tour as executive officer of a large-deck amphibious assault ship, commanding officer of a dock landing ship, and commodore responsible for fourteen amphibious ships of various classes.

In the course of these assignments, the one term I heard most frequently from my U.S. Marine Corps brethren was "cube."

HMAS ADELAIDE (L01) Deploying MH-60R Helicopter (image Defence).

That is, how many cubic feet (or meters) of gear those ships could hold as they carried Marines to the objective area. Each and every ship I served on was stuffed to the gills with necessary gear for the Marines. For our U.S. Marines, "more" is always better. It is likely that the ADF troops embarked in *Canberra-class* amphibious ships have the same metric—more is always better.

As opposed to armies that travel over land and which can have large supply trains provide continuous resupply, everything amphibious forces bring to the fight or to deal with a natural disaster must come by sea and need to be there at the ready, not days or even weeks away. It is unlikely that Australia will build additional *Canberra-class* amphibious ships in the near- or even mid-term.

The question then becomes: How do Australia's expeditionary forces bring more "kit" to the fight. The answer may be to watch how the U.S. Navy evolves missions for its intended fleet of uncrewed maritime vehicles and see how some of these lessons might lead to having these relatively low-cost assets add value to expeditionary forces led by the *Canberra-class* amphibious ships.

THE UNMANNED REVOLUTION

The conflicts in Iraq and Afghanistan spurred the development of unmanned air vehicles and unmanned ground vehicles to meet urgent operational needs. As a result, the lion's share of previous years funding for unmanned systems has gone to air and ground systems, while funding for unmanned maritime systems (unmanned surface vehicles and unmanned underwater vehicles) has lagged.

However, this balance is shifting, as increasingly, warfighters recognize the need for *unmanned maritime systems* in the fight against high-end adversaries, as well as against nations to whom these nations export their weapons systems. Like their air and ground counterparts, these unmanned maritime systems are valued because of their ability to reduce the risk to human life in high threat areas, to deliver persistent surveillance over areas of interest, and to provide options to warfighters that derive from the inherent advantages of unmanned technologies.

In order to support U.S Navy CNO Gilday's aspiration for a 500-Ship Navy comprised of 150 large uncrewed maritime vehicles, the U.S. Navy is moving proactively to test and evaluate a number of these systems in a wide-array of exercises, experiments and demonstrations. The U.S. Naval Sea Systems Command, as well as the Navy laboratories that provide the technical expertise for the development of many unmanned surface and subsurface unmanned systems, have been accelerating the development of these USVs and UUVs. The U.S. Navy has partnered with industry to develop, field and test a family of USVs and UUVs such as the Medium Displacement Unmanned Surface Vehicle (*Sea Hunter*), MANTAS and *Devil Ray* next generation unmanned vessels, the Large Displacement Unmanned Underwater Vehicle ("LDUUV") and others.

Here is one small indication of the breadth and depth of how the U.S. Navy is making a huge commitment to these uncrewed assets. The program manager of the Navy Program Office (PMS-406) with stewardship over unmanned maritime systems granted the U.S. Naval Institute an interview where he discussed the future of USVs and UUVs. The title of the *USNI News* article, "Navy Racing to Test, Field, Unmanned Maritime Vehicles for Future Ships," captures the essence of where unmanned maritime systems will fit in tomorrow's U.S. Navy, as well as the Navy-after-Next. Here is part of what the PMS-406 Program Manager shared:

> In addition to these programs of record, the Navy and Marine Corps have been testing as many unmanned vehicle prototypes as they can, hoping to see the art of the possible for unmanned systems taking on new mission sets. Many of these systems being tested are small surface and underwater vehicles that can be tested by the dozens at tech demonstrations or by operating units.

While Australia has its own industries that produce uncrewed maritime vehicles, given the degree of effort the U.S. Navy is putting into evaluating these systems, this is one area where the ADF and RAN might be well-served to be "fast followers" and, as the U.S. Navy down-selects to a discrete number of these systems, evaluate the best-of-breed for possible inclusion in the RAN's inventory as assets to complement Australia's expeditionary forces to enable them bring more "kit" to the fight.

USAV *Sea Hunter* deployed to Hawaii and back.

A DISCIPLINED APPROACH TO UNCREWED MARITIME VESSEL PROCUREMENT AND EMPLOYMENT

Australia and the United States – and likely most nations – cannot afford to acquire all of the military hardware they believe that they might need. Tradeoffs must inevitably be made, all of which are subject to review by each nation's parliaments or congresses. The U.S. Navy has been forthright and transparent regarding its desire to procure large numbers of uncrewed maritime vehicles. This, perhaps inevitably, has brought with it a great deal of scrutiny by the U.S. Congress. If Australia decides to invest substantially in uncrewed maritime vehicles, understanding and anticipating some of the potential criticism of such plans can go a long way to smoothing the path for their eventual procurement and use.

A sceptical Congress has challenged the Navy to come up with a concept of operations (CONOPS) for how it intends to use these platforms. Compounding this challenge is the extended time needed to develop and field new systems within the U.S. DoD acquisition process. This may require a shift to utilizing commercial-off-the-shelf (COTS) unmanned surface vehicles to get more of these platforms into the Navy fleet as soon as possible. Here is how a Jane's report put it:

> The USN has faced difficulty in finding funding for its unmanned and autonomous technology plans as it also strives to maintain the readiness, numbers, and capability of its existing manned fleet. US lawmakers have balked at the service's efforts to shift money from legacy ship programmes toward proposed unmanned ones – in part because the USN has yet to develop a track record in the development of unmanned systems.
>
> To address these challenges, defence analysts have suggested that the USN could leverage existing unmanned systems – especially in the commercial arena – to affordably develop the service's own unmanned experience, win over the trust of US lawmakers, and field the technology sooner than would be possible under new programmes started from scratch. Navy programme officials said they have been doing just that in tests and exercises.

Beyond concerns voiced by a skeptical Congress, outside observers have piled on, expressing concerns that the Navy's plans for unmanned systems—particularly unmanned surface vessels—are at best muddled, and at worst, unachievable. Here is how one national security professional put it in an article in War on the Rocks:

> The U.S. Navy is moving forward with its plans for a more distributed fleet in which intelligent unmanned or autonomous platforms will play a significant role. Unfortunately, many of the details about these novel systems are left to the imagination. Missing from the technology discussions is how the Navy plans to sustain large quantities of unmanned systems.
>
> Furthermore, unless these systems have exceedingly long range and endurance, launching and recovering them must be done with some proximity to their operational locations, presumably at risk of attack from the adversary. This begs the question: What part of the Navy force structure and budget will be used for large-scale sustainment of unmanned systems at sea.

These, and other, criticisms have led some innovators both inside and outside the U.S. Navy to evolve a CONOPS for the use of large, medium and small uncrewed maritime vehicles to *directly* support naval operations. Leveraging this sort of CONOPS can accelerate the development and fielding of these systems to add to the "kit" of Australia's expeditionary forces.

A CONCEPT OF OPERATIONS FOR UNCREWED SURFACE VESSEL EMPLOYMENT

A proposed concept of operations that may well lead to a more rapid integration of unmanned systems into the U.S. Navy – as well as other navies such as the Royal Australian Navy – is to marry various size uncrewed surface, subsurface and aerial unmanned vehicles to perform missions important in naval operations. Simply put, navies can use the evolving large unmanned surface vehicle (LUSV) as a "truck" to move smaller USVs, UUVs and UAVs into the battle space in the increasingly contested littoral and expeditionary environment.

The U.S. Navy has categorized the range of USV's into "Large" LUSV, "Medium" MUSV and "Small" USV categories. The technical challenge is to make these different sized craft work together as an integrated team of platforms that not only operate together but can be launched and recovered from each other in a larger UxV-UxV operational, mission-focused, environment. Effectively, this integration can be looked at as "Nested Dolls" where the LUSV is sized to operate as part of an expeditionary strike group. The LUSV will carry the MUSVs onboard and they, in turn, are configured to carry the small USV, along with UAVs and UUVs. This represents a true Nested Dolls approach.

While there are a plethora of important naval missions this Nested Dolls combination of unmanned platforms can accomplish, three that are important to *all* navies are: intelligence surveillance and reconnaissance, expeditionary logistics, and mine countermeasures. There are many large, medium, small and ultra-small unmanned systems that can be adopted for these missions. The technical challenge remains that they must be designed to ensure that the multiple sized UxVs associated with these missions can be adapted to work together in a common mission goal.

Uncrewed maritime systems have performed all three of these missions during a number of U.S. Navy and Marine Corps exercises, experiments and demonstrations. In each case, these systems not only demonstrated mission accomplishment, but also the hull, mechanical and electrical (HME) attributes and maturity that the U.S. Congress is demanding before proceeding ahead with robust acquisition of Navy unmanned systems.

Article length requirements preclude looking at all three of these missions in detail. Therefore, I will focus on a mission of importance to all navies since the beginning of naval warfare, that of intelligence surveillance and reconnaissance (ISR). There is little question that this is a mission of importance the ADF and RAN, and once where uncrewed maritime systems can make an enormous contribution, not only by keeping crewed platforms out of harm's way, but also by freeing these scarce and expensive assets for other missions.

For centuries, commanders have struggled to collect enough information to give them the edge in combat. As the Duke of Wellington famously said: "All the business of war is to endeavour to find out what you don't know by what you do; that's what I call guessing what's on the other side of the hill." From Salamis, to Lepanto, to Trafalgar, to Jutland to other naval battles, commanders

USAV *Mantas* T-12 operating with Royal Bahrainian Naval Ship ABDUL RAHMAN AL-FADEL (p22) Oct 22 (Image USN AB Dawson Roth).

have attempted to lift the "fog of war" by determining where the enemy was sailing.

The Ship-to-Shore Manoeuvre Exploration and Experimentation (S2ME2) Advanced Naval Technology Exercise (ANTX) (S2ME2 ANTX) provided an opportunity to demonstrate innovative technology that could be used to address gaps in capabilities for naval expeditionary strike groups. S2ME2 ANTX had a focus on unmanned surface systems that could provide real-time ISR and intelligence of the battlefield (IPB) of the battlespace.

During the assault phase of S2ME2 ANTX, the expeditionary commander used a USV to thwart enemy defenses. The amphibious forces operated an eight-foot MANTAS USV which swam into the enemy harbor (the Del Mar Boat Basin on the Southern California coast) undetected, and relayed information to the amphibious force command center using its TASKER C2 system. Once this ISR mission was complete, the MANTAS USV was driven into the surf zone to provide IPB on obstacle location, beach gradient, water conditions and other information crucial to planners.

LEVERAGING THE U.S. NAVY'S EXPERIENCE

While this is just *one* U.S. Navy exercise, it is an event that demonstrated how effective uncrewed maritime systems can be in performing this vital naval mission. As Australia's expeditionary strike groups range throughout the Indo-Pacific region and beyond, using this Nested Dolls approach can provide critical capabilities.

If Australia procures a number of LUSVs it can use them as "trucks" that are attached to *Canberra-class* amphibious ship-led expeditionary strike groups. These LUSVs can then carry medium and small USVs, UUVs and UAVs sized to perform the ISR mission as well as others of importance to the expeditionary strike group commander.

To be clear, this is not a platform-specific solution, but rather a *concept*. When naval operators see a capability with different size unmanned COTS platforms in the water working together and successfully performing these missions, they will likely press industry to produce even more-capable platforms to perform these missions.

While evolutionary in nature, this disruptive capability delivered using emerging technologies can provide the ADF and RAN with near-term solutions to vexing operational challenges, while demonstrating to the larger Australian Defence establishment, the Australian Parliament and the nation's public writ large that there is a way to add to the kit Australia's expeditionary strike groups to make these naval formations more lethal and survivable. This will enable Australia to continue to provide for the defense of the nation, as well as the security and prosperity of the greater Indo-Pacific region, while dealing with the growing pacing threats in the region. ■

USAV *Devil Ray* T38 (Imagae MARTAC).

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ARAFURA-CLASS LISTED

In the early days of scoping the *Arafura-class*, the Capability Acquisition and Sustainment Group took the incredible decision to de-fang and under-arm the class. Ostensibly to ensure that politically, it was not seen as a Corvette but an OPV and it would not therefore challenge the *Hunter-class* and *Hobart-class* procurements.

The Canberra Margin The Canberra experts took a perfectly reasonable design and decided to remove from it, its primary weapon system, targeting radar, and strengthened flight deck. Capable of operating large maritime helicopters, in addition to UAV.

The same experts did not leave the original design as "Fitted for; not With (FFNW)", but took the extraordinary decision to remove and detune, so that the final class could no longer sustain the weapons, sensors, and aircraft it was originally designed to carry. An act of *strategic vandalism* that ultimately puts crews and ships at risk.

Not satisfied with defanging the ship for Australian political-military purposes, the successful design by Lürssen was then shoehorned into the WA-based shipbuilder, Austal. To be included in the program as a sub-contractor. Leading to significant delays as designs were re-drafted and contracts let for what was, by now, a unique Australian class. No longer in the class of similar vessels operated worldwide. With all the additional sustainment and maintenance requirements / costs that go with any small-in-number variant, no longer in class.

Three issues have emerged:

1. Seaworthiness and stability issues due to problems meeting the changed design and marrying civil (Lloyds Register) standards with naval engineering standards and practices;
2. The defanged lightly armed Lürssen OPV is no longer considered sufficient to be up-armed (as per the original design) to meet emerging Indo-Pacific requirements in an increasingly contested environment. Including coming up against Chinese maritime militia forces incorporating its fishing fleet.

   A senior Government official apparently told the ABC, that:

   It's late, has next-to-no armament, a helicopter platform that is not strong enough for helicopters, it isn't seaworthy and there are safety standard issues.
3. It may not be possible to adequately up-armour the unique *Arafura-class* without adding to existing stability concerns. These same instability issues, are likely to further constrain weapon and sensor choices.

USS GERALD R FORD (CVN 78) at anchor off Portsmouth UK with Isle of Wight in the background.

Adding to delays, are issues impacting all workforces following COVID border shutdowns, and the upswing in mining (ironically iron and coal) industry competition.

If Australia had simply bought into the existing Lürssen design (on a FFNW basis), instead of applying the Canberra Margin (see Dr Baird, this issue paper 1), it is very likely that Australia would today have a perfectly adequate Corvette sized warship, capably of being up-armoured to meet current and future threats, within stability margins. In addition to being a ship in a common, sustainable, and maintainable worldwide class – including with regional navies. Irrespective of where it was built.

The question now facing the Defence Strategic Review (DSR) is whether to continue with the *Arafura-class*, knowing it may never be adequate to fulfil strategic Defence needs, today and tomorrow. Or to discontinue the class and replace with a design that will allow for commonality with other navies, and growth within stability margins. Or to discontinue the *Arafura-class* and allow Austal and, or, INCAT to design and build an alternative commercial hull variant. Suitable to Australian waters, and that leverages directly off very successful existing Austal and INCAT designs. As advocated by Dr Baird in Paper 1.

LESSONS NOT LEARNED?

The critical issue regarding the *Arafura-class* and LHD designs is that Canberra needs to "stop thinking with a peacetime mentality". It is this mentality that allows for the apparent acts of strategic vandalism that are currently crippling Australia's ability to grow and respond to the "pacing threat", referred to by Captain Galdorisi in paper 2 (this issue).

The same lessons were not learned from the design of the LHD (HMA Ships CANBERRA (L02) and ADELAIDE (L01)). In sum, the Canberra experts in this case – probably in acquiesce to political imperatives that the ship was not to be an aircraft carrier, and associated RAAF demands for the F-35A, not the F-35B carrier variant – acquired a class that was not capable of operating fixed wing aircraft. Unlike the original design, the *Juan Carlos-class*, already successfully operating F35B with the USMC and USN. In addition to its Harriers.

The act of *strategic vandalism* in this instance, again took a perfectly adequate design and, rather than allowing the class to be "fitted for but not with", deliberately removed this capability. By changing deck strengthening designs, fuel arrangements, and flight deck lifts. So that the *Canberra-class* cannot operate F-35B without modification. At exactly the time, when the maritime aircraft of choice, operated by the USMC, the USN, Japan, the UK, and many other Allies – including, potentially Singapore, when it acquires ships (possibly of civil design) capable of being operated as aircraft carriers – is the F-35B. Not the F-35A.

Worryingly, as pointed out previously in *The NAVY*, the two DSR Professors (Smith and Houston) were in power during the time at which the decisions for the F-35A and the de-fanged LHD were taken. It will be a measure of them both, if they are able to admit their own mistakes, start thinking "what we would do if we were at war" and restore the capabilities now urgently required.

SELF DEFENCE

Although not an act of *strategic vandalism*, per se, critical underinvestment in close in weapons systems (CIWS), close range systems (CRS) and SAM has left all classes of RAN warship, less potentially the *Hobart-class*, critically under armed in terms of Self Defence.

A recent CRS Report into *US Navy Shipboard Lasers* [1], stated "two key limitations that Navy surface ships currently have in defending themselves against UAVs and anti-ship missiles are:

1. limited depth of magazine and;
2. unfavourable cost exchange ratios.

Limited depth of magazine refers to the fact that [US] Navy surface ships can use surface-to-air missiles (SAMs) and their Close-in Weapon System (CIWS) Gatling guns to shoot down only a certain number of enemy UAVs and anti-ship missiles before running out of SAMs and CIWS ammunition (*) a situation (sometimes called "going Winchester") that can require a ship to withdraw from battle, spend time travelling to a safe reloading location (which can be hundreds of miles away), (**) and then spend more time traveling back to the battle area.

Given these additional constraints, the deployment of RAN vessels significantly up-threat becomes problematic. As suggested in previous papers provide to *The NAVY*, including by Senator Jim Molan, Mark Schweikert, and Dr Neil Baird. Amongst others.

A critical aspect of Self Defence is being able to survive, which includes being "able to militarily, politically, economically, and industrially afford to lose assets, in order to use them". This is not attritional but plays into the designs of ships at scale (size and numbers) that will be necessary to cross the line of battle. As the Russian Navy is finding to its cost in the Black Sea. Current designs do "not fit".[2]

AUSTRALIA NAVAL SHIPBUILDING AND SUSTAINMENT GROUP

Naval shipbuilding and sustainment activities are to be overseen by a new group created within the Department of Defence (DoD). The new agency – the N*aval Shipbuilding and Sustainment Group* (NSSG) – is led by Tony Dalton, Rear Admiral RAN (Ret) formerly the deputy secretary of naval shipbuilding in the DoD's Capability Acquisition and Sustainment Group (CASG). It will comprise also CASG maritime divisions.

The formation of the NSSG came shortly after the announcement of a $322M five-year contract with *Raytheon Australia,* to provide in-service support for the combat systems of the six *Collins-class* submarines.

Minister for Defence Industry Pat Conroy recently announced a six-year $155M contract with *BAE Systems Australia* to become the Capability Life Cycle Manager for the three *Hobart-class* air warfare destroyers. Minister Conroy stated:

> Under the new approach, *BAE Systems* will steer the destroyers through life, including a significant upgrade to their combat management system in 2024.

HMAS WOLLONGONG DECOMMISSIONS

The *Armidale-class* Patrol Boat HMAS WOLLONGONG (P92) decommissioned at a ceremony in HMAS CAIRNS in December, after 15 years of service.

The outgoing Fleet Commander, Rear Admiral Jonathan Earley, CSC, RAN, attended the ceremony and recognised the service of the Ship's Company.

HMAS WOLLONGONG and the crews who have served in the vessel have made a significant contribution to our national interest.

These professional and dedicated men and women have protected our nation's borders and offshore maritime interests from illegal activity.

While today's decommissioning is a necessary part of renewing our fleet, it is also an opportunity to honour the contribution made by the crews who have served Australia in HMAS Wollongong.

Navy is transitioning to 12 new *Arafura-class* Offshore Patrol Vessels. These boats have greater range and endurance than our existing boats. This will allow Navy to protect Australian interests over great distances and in more complex maritime environments.

USS FORD ON FIRST OFFICIAL DEPLOYMENT

USS GERALD R FORD (CVN 78) departed Norfolk, Virginia, on 4 October 2022 for its first official deployment.

USS FORD will not currently be deployed as part of the USN Global Force Management deployment. Rather it will be sent on a Retained Service deployment, according to Vice Admiral Daniel Dwyer, commander of United States 2nd Fleet and Joint Force Command.

The ship's first Global Force Management deployment is currently planned for 2023.

The type of deployment is determined in a large part by Operational Command and technical Control. The deployed force reports to the geographic combatant commander for Global Force Management deployments. For example, INDOPACOM in the Pacific. For service-retained deployments, Admiral Michael Gilday, the chief of naval operations (CNO), maintains operational command.

Vice Admiral Dwyer said, "The deployment of USS GERALD R FORD's carrier strike group (CSG) is the natural progression of our renewed commitment to the Atlantic." Specifically, also to support and bolster NATO Allies during the Russo-Ukraine war.

US commands and units participating in the GERALD R FORD Carrier Strike Group (GRFCSG) deployment include:

- Carrier Strike Group (CSG) 12,
- Carrier Air Wing (CVW) 8,
- Destroyer Squadron (DESRON) 2,
- guided-missile cruiser USS NORMANDY (CG 60),
- guided-missile destroyers USS RAMAGE (DDG 61), USS MCFAUL (DDG 74), and USS THOMAS HUDNER (DDG 116),

SM6 Missile (Image Raytheon).

HMAS WOLLONGONG alongside Fleet Base East NSW prior to Decommissioning (Image LSIS Matthew Lyall).

- USNS replenishment oiler Joshua Humpreys (T-AO-188),
- dry cargo ship USNS Robert E Peary (T-AKE-5), and;
- US Coast Guard high endurance cutter USCGC HAMILTON (WHEC-715).

FINCANTIERI MARINETTE MARINE COMMENCES FRIGATE CONSTELLATION BUILD

Fincantieri Marinette Marine (FMM) officially began construction on the first US Navy (USN) *Constellation-class* guided missile frigate, CONSTELLATION (FFG 62), in late 31 August at the FMM shipyard, Marinette, Wisconsin, with the first steel cut.

The USN awarded FMM the *Constellation* detail design and construction contract in April 2020. Start of construction began after FMM successfully completed the critical design review in May and the production readiness review in July.

Rear Admiral Casey Moton, the programme executive officer, stated FMM had surpassed the 80% detail-design objective the USN wanted before the start of construction.

Delivery of CONSTELLATION is due 2026. FMM is also on contract to build CHESAPEAKE (FFG 64) and CONGRESS (FFG 63). The USN plans to build 20 *Constellation-class* ships.

Marco Galbiati, CEO of Fincantieri Marine Group said:

> We invested more than $450 million ($300M USD) into our Marinette shipyard to build many frigates for the US Navy;
>
> We stand ready to deliver the two frigates a year the navy requires.

The USN initially planned to build two frigates annually starting in fiscal year (FY) 2023. The FY 2023 proposed budget called for the service to alternate between an annual buy of one per year and two per year. Changes in acquisition planning will depend on funding and industrial base capacity. Noting that agreement as to the size of the US Navy, its growth path, and the ratio of crewed to uncrewed vessels has yet to be approved by Congress. See paper 4, this issue.

US APPROVES SM-6 SALE TO JAPAN

Seen as an essential element of Tokyo's future efforts to enhance air- and missile-defence capabilities alongside future technologies to detect and track supersonic glide weapons and research on modern railguns, the SM-6 is a cornerstone of Japan's Defence White Paper, *Defense of Japan* 2022

The US Department of State approved a request by Japan to procure Standard Missile 6 (SM-6) air-defence missiles for an estimated $670 million, the US Defense Security Cooperation Agency (DSCA) has announced.

The Foreign Military Sales (FMS), which requires approval from Congress, includes 32 SM-6 Block I missiles, in two tranches of 16, MK41 vertical launch system (VLS) canisters, and a range of related equipment and services.

The DSCA said SM-6:

> will also provide the US-Japan security alliance with the latest and most advanced capabilities, reducing Japan's reliance on US forces for the defence of Japan and further improving US-Japan military interoperability.

Japan was considered by Raytheon as a potential customer of SM-6, alongside Australia and South Korea. Navies. All looking to upgrade their surface fleets Baseline 9 Aegis combat system, integrated with SM-6.

In September 2018 Tokyo confirmed its plan to equip the Japan Maritime Self-Defense Force's (JMSDF's) two improved Atago-class destroyers with the SM-6.

The Republic of Korea (RoK) Navy plans to integrate the SM-6 missiles onto its KDX-III destroyers,.

Navy plans to equip its three *Hobart-class* guided-missile destroyers and its future *Hunter-class* frigates with the SM-6. And to upgrade the Aegis system on the *Hobart-class* destroyers to Baseline 9 from 2024. Baseline 9 is also identified for the *Hunter-class*.

SM-6 is a multi-purpose, sea-based terminal defence and anti-surface missile over sea and land, with a range estimated at 370 km. Block I is anti-air warfare-capable, with a dual-mode seeker (active and semi-active), a solid-rocket booster, and dual-thrust sold rocket motors.

NAVAL GROUP FLOATS FDI FRIGATE FOR FRENCH NAVY

French shipbuilder Naval Group today floated the first defense and intervention frigate (FDI), AMIRAL RONARC'H (D660), for the French Navy (Marine Nationale). See back page, this issue.

The November event was a partial launch. The covered construction dock where the first FDI frigate took shape was floaded. However, the hull of AMIRAL RONARC'H was not taken out to the outfitting pier on the Scorff river due to weather condition. This step, performed with tugboats, is expected to be performed later.

The ceremony took place in presence of Sébastien Lecornu, French minister of the Armed Forces, and his Greek counterpart, Nikolaos Panagiotopoulos. The ship is expected to be delivered to the French Navy in 2024.

The Frégate de Défense et d'Intervention (Defence and Intervention Frigate) or FDI, is also known as *Frégate de Taille Intermédiaire* (Medium-Size Frigate) or FTI. It is a planned class of up to 15 French frigates. As of early 2022, five ships have been ordered for the French Navy, with the lead ship being named AMIRAL RONARC'H, and an additional three, more heavily armed vessels, for the Hellenic Navy, with the lead ship named KIMON.

RFA *Fort Victoria* (A387) Leaves the Firth of Forth to take up Operational Duties with CSG23.

SEIZURE IN GULF OF GUINEA

On 30 November, under the direction of the Maritime Prefect of the Atlantic and the Prosecutor of the Republic of Brest, the French amphibious helicopter carrier (PHA) TONNERRE (L9014) seized more than 4.6 tonnes of cocaine from a tugboat in the Gulf of Guinea.

Supported by a Falcon 50 aircraft detached to Dakar and two embarked helicopters, FS TONNERRE visiting team intervened aboard the Brazilian tug to ascertain the nature of its cargo. With the approval of the Brazilian authorities, the French sailors searched the building and discovered numerous bales of cocaine. These were then destroyed on board. This seizure of more than 4.6 tons of cocaine represents a total value estimated at €150 million.

GREENWICH STATION

The ship responsible for supporting the UK aircraft carrier task groups with fuel and ammunition is returning to full operations after an extensive refit.

RFA *Fort Victoria* deployed for seven months of 2021 deployed with Carrier Strike Group, 21 during its mission to the Indo-Pacifi. Keeping warships, aircraft and sailors fuelled and fed across a combined 500,000 nautical miles.

RFA *Fort Victoria* and RFA *Tidespring* – were critical components of the global deployment providing most of the group's needs – fuel, food, ammunition, spare parts, replacement engines and the like.

Much of 2022 has seen *Fort Victoria* at Liverpool's Cammell Laird shipyard for extensive repairs and upgrades, especially on her engines, to ready her for the front line once again ahead of a jam-packed 2023.

Captain Martin Jones, Commanding Officer of Fort Victoria, said:

> It's pleasing to get Fort Victoria back to sea after a lengthy period in the shipyard and allow her to stretch her legs.
>
> We are very much looking forward to returning to the fold of Carrier Strike and supporting Carrier Strike Group 23.

The UK Royal Navy's (RN) second *Daring (Type 45)-class* destroyer, HMS DAUNTLESS (D33), has returned to base-port Portsmouth after completing engine trials as part of a major power generation upgrade and get-well programme.

DAUNTLESS is the first in class to complete the upgrade, known as the Power Improvement Project (PIP), which seeks to improve resilience of the destroyers' power and propulsion system. It is one part of *Project Napier*, intended to overcome problems that have affected the performance *Type 45s* since coming into service, 17 years ago. The ship may already be considered at half-life.

The programme is being delivered by prime contractor BAE Systems in collaboration with BMT Defence Services and Cammell Laird under a £160 million ($270M) firm-price contract awarded by the UK Ministry of Defence (MoD) in March 2018.

Work began at Cammell Laird's shipyard in Birkenhead in spring 2020 and included removing and replacing the two original 2 MW Wärtsilä diesel generators with three more reliable, more powerful, and cleaner MTU Series 4000 generators (3 MW each). In addition, a storeroom has been converted into a high-voltage switchboard to process the extra power generated – which amounts to between 4 and 5 MW.

As the first in class to complete the upgrade, programme of work will act as the foundation for upgrade work on the remaining five ships in the class.

Lieutenant Commander Amy Glover, DAUNTLESS's Marine Engineering Officer, said "that indications from the sea trials stipulated that so far, the PIP was delivering exactly what it set out to do".

The CO, Commander Ben Power RN, considered "the PIP will provide the additional flexibility and power that future-proofs the class for the next 20–30 years, as well as enable the RN to embark and integrate future weapon systems".

The ship is intended to return to the Fleet in mid-2023.

Note 3. HMS DARING, the first of class, was launched in 2006. The last of class, HMS DUNCAN, in 2010. Assuming a Design-life of 25 years, DARING should be decommissioning in or about 2032, and DUNCAN in 2036. The indication of the CO is that the class will be extended by a decade or so, decommissioning between 2043 and 2047. In actuality, the RN needs to be bootstrapping some of its highly innovative designs into early build and service. Replacing the class by the late 2020s; not the mid-2040s. ■

NOTES

* US Navy cruisers have 122 missile cells; Navy destroyers have 90 or 96 missile cells. Some of these cells are used for storing and launching Tomahawk land attack cruise missiles or anti-submarine rockets. The remainder are available for storing and launching SAMs. A US Navy cruiser or destroyer might thus be armed with a few dozen or several dozen SAMs for countering missiles and UAVs. Countering missiles and UAVs with SAMs might sometimes require shooting two SAMs at each enemy missile.

Note 1: these are significantly larger magazines than any held in existing RAN (and RN) Frigates and Destroyers.

** The missile cells on a Navy cruiser or destroyers are clustered together in an installation called a Vertical Launch System (VLS). VLS cells cannot be reloaded while the ship is underway; a ship needs to return to a port or a calm anchorage to reload its VLS.

Note 2: calm Pacific anchorages and ports for ammunitioning ships is a known constraint on the RAN.

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India Navy Conducting Amphibious Operations in the Andaman and Nicobar Islands.

INDAUS ECONOMIC SECURITY COOPERATION

Writing in *The Interpreter* (6 Dec) Radhey Tambi, noting the Fleet Commander (Rear Admiral Jonathan Earley RAN) comments of "big power muscle movements" during a visit to India, suggested "a coordinated maritime domain awareness program would act as a force multiplier".

In accordance with Indian Maritime Doctrine (established during both WWI and WW2), the region from the east coast of Africa to the western shores of Australia is the primary area of responsibility of the Indian Navy, whereas the north-eastern part of the Indian Ocean is a priority area for Australia as described in the *2020 Defence Strategic Update.*

India's Andaman and Nicobar Islands lie close to the Strait of Malacca, while Australia's Cocos (Keeling) Islands are also located near strategic waters of Indonesia, with access to Sunda, Lombok, and Wetar Straits. Together, Tambi recognises that these territories cover the entry and exit points of the Indian and Pacific Oceans; the three peninsulas and three bays.

There is increased economic interest in the region, including more recently a significant increase in illegal, unreported and unregulated fishing. There is also a growing number of Chinese research vessels, submarines, and underwater drones operating in the Indian Ocean has raised concerns. The island territories of India and Australia offer the chance to strengthen maritime surveillance in the region, as well as develop ties with other partners.

Chinese research vessels in addition to collecting information about resources, also collect data related to salinity, depth, and turbidity, along with oxygen and chlorophyll levels. The use of this data is not necessarily limited to civil use is also used for tracking foreign submarines and maintaining egress routes for the operation of Chinese submarines.

Hotspot

The hotspot is the shallow water of Ninety East Ridge, which divides the Indian Ocean into the East and West Indian Ocean.

India and Australia currently use the Andaman and Nicobar Islands and Cocos (Keeling) for surveillance and reconnaissance. The proposal to tfly P-8 aircraft through and from the islands, which lie north and south of each other, would act as a force multiplier. Such a program would improve interoperability of the forces and strengthen the deterrence and defence objectives of both countries, complementing a logistics agreement that allows the islands to be used for refuelling purposes when India's ships are entering the Pacific Ocean and when Australia's ships are entering the Indian Ocean.

Extended Deterrence

Such patrols would additionally assist in the tackling of piracy, which is on the increase. Burden-sharing would also help in addressing regional challenges, including disaster events resulting from climate change, as well as search and rescue operations. India, Australia and Indonesia already serve as the primary information providers for tsunami warnings in the Indian Ocean region. Extended cooperation will assist in covering the breadth of potential challenges to come and provide a form of regional *Extended Deterrence.* [1]

> the systematic, multidimensional, attempt to persuade an adversary, through the prospect of military engagement, defensive support, intervention, or retaliation, not to attack an ally, and to provide reassurance to that ally about the continuing security of the relationship. [2]

Economic Opportunities

The coordinated relationship between New Delhi and Canberra opens the potential to engage with other nations in the western part of the Indian Ocean, too. Maritime cooperation with India also opens up the opportunity for investment in ship design and building opportunities as Australia (and the U.S.) seeks to divest its reliance on China.

The QUAD, while being a Defence agreement nonetheless opens up the opportunity for economic cooperation and direct investment in both civil and military enterprises. The challenge posed by China through currency manipulation and tariffs means that the cost of labour per hour is $2.0 in China compared to $20 in the West. A ten-fold markup.

The freezing for 10-years of US Technology investment and offshoring to China, in addition to other investment disincentives, has increased the cost of China labour to between $4.0 and $5.0, a four-fold mark up. At this cost, investment in India becomes significantly more attractive.

MARITIME STRATEGIC FLEET TASK FORCE

The Commonwealth established a *Maritime Strategic Fleet Task Force* to strengthen economic sovereignty and support improved National security outcomes. The Strategic Fleet will be made up of vessels which are Australian Flagged and crewed.

The Task Force is led by the usual Canberra luminaries, including the Chair, Mr John Mullen (also Chair of Telstra); Dr Sarah Ryan (NEO Woodside); Ms Angela Gillham (BSc, CEO Maritime Industry Australia Ltd.); Major General Jason Walk (Defence Estates) and Mr Paddy Crumlin (Joint Deputy National Secretary of the MUA). The board is more notable by who is absent – including industry (e.g., as represented by Svitzer, Baird Maritime, etc.), the energy sector, the Navy, Merchant Navy Associations, Port Authorities, the NLA, shipbuilding, Higher Education, TAFE, Research (CSIRO), and the TF instigator, the Hon. Bill Shorton MP.

The first phase will report on high-level strategic objectives for the fleet at the end of 2022.

Given the *de facto* backdrop of nationalisation (according to *Santos* CEO, Kevin Gallagher) of the Reliables energy market (Coal, Oil, Gas), including production and extraction, through caps and windfall taxes, in addition to 1970s style IR changes, the continuing ban on nuclear power, and Renewables Green Tape (laundering and washing) all contributing significantly to inflation (more so than Russia's war on Ukraine), the likelihood of investment in Australia's maritime industry appears increasingly remote.

Don't hold your breath. ■

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1ST PLACE

MUTUALLY ASSURED DRONE SWARM WARFARE

By Jonathan Wilson

Unmanned underwater vehicles (UUVs) are entering service in modern navies without much fanfare. In 2022, satellite imagery of China's Sanya naval base in Hainan Island revealed what appeared to be two Extra Large Unmanned Underwater Vehicles (XLUUVs). [1] One observer identified them as competing prototypes, demonstrating the commitment of the People's Liberation Army Navy (PLAN) to this technology. [2] A US underwater glider captured by the PLAN [3] in 2016 also suggested a broader pattern of US Navy (USN) drone operations. The recent sabotage of Nord Stream pipelines demonstrated that grey zone warfare is a clear and present danger, [4] that will only be amplified by the proliferation of UUVs. The AUKUS pact promises nuclear attack submarines (SSNs) for the Royal Australian Navy (RAN). [5] If Australia wants to maintain a networked and sophisticated force, the acquisition of UUVs into the RAN and their pairing with multiple platforms is of equal importance.

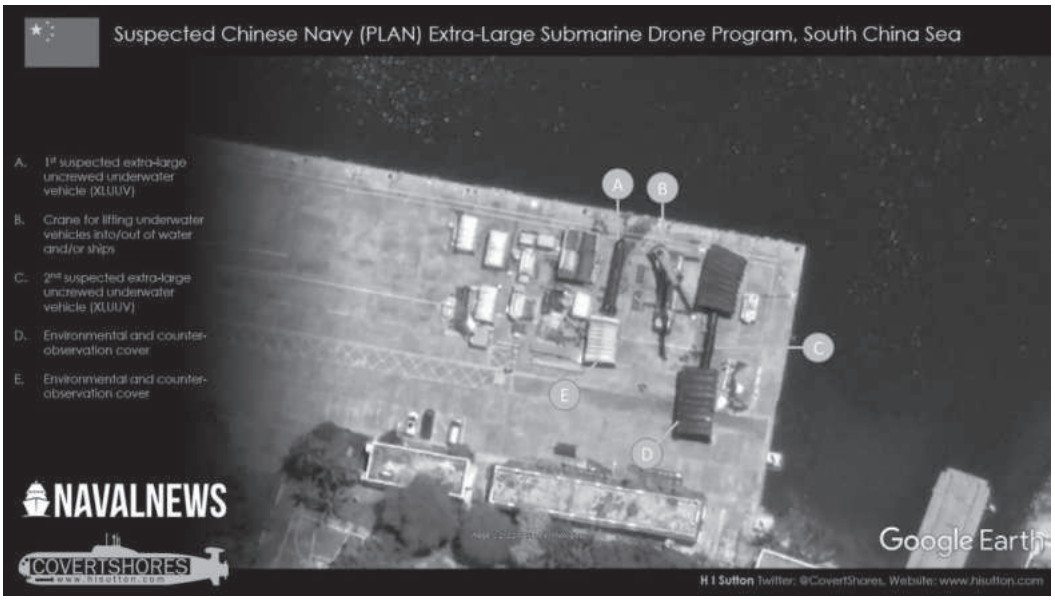


Figure 1 Maxar Technologies Satellite Imagery with labels from HI Sutton.

INTRODUCTION

The integration of UUVs into the navies of major powers is progressing in a prototypical manner. In 2019, the People's Republic of China (PRC) revealed its HSU-001 'large unmanned' drone which – though the specifications remain classified – will likely enhance China's underwater surveillance capabilities. [6] The United States will integrate the XLUUV Boeing Orca into an increasingly 'distributed' fleet. [7] At this stage, the Orca's mission profile – mine delivery, payload delivery and what is dubbed Concept of Operations (CONOPs) work – is relatively humble. [8] The Orca is designed to incorporate future technological developments through a "modular" design, meaning it can be easily reconfigured with new sensors, weapons and other technology as required. [9]

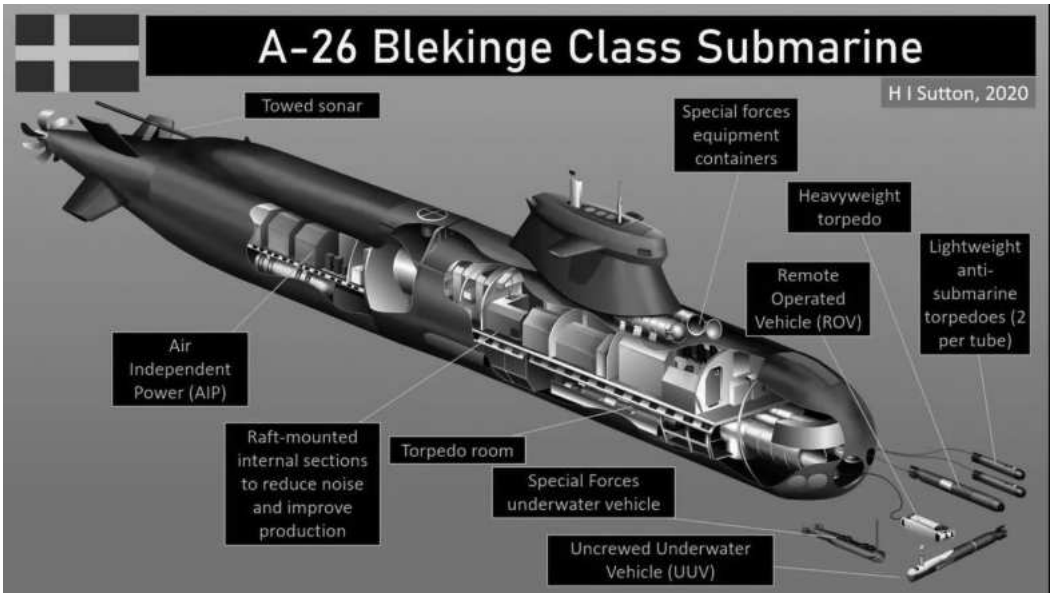
For a middle power with a small population and vast landmass, the Australian Defence Force (ADF) has long punched above its weight in global operations. Australia can more than hold its own as an AUKUS member and as a regional player in the Indo-Pacific. In the long term, proliferation of Robotics, Autonomous Systems and Artificial Intelligence (RAS-AI) will ensure the transformation of naval operations. Through experimentation the RAN can build up a body of tactical and operational knowhow that will be invaluable to allies and in future contingencies. Of course, regional proliferation of these systems could well be a doubled-edged sword.

The list of warships sunk by anti-ship missiles demonstrates the power of asymmetric platforms against larger, capital-intensive platforms. Marcus Hellyer of the Australian Strategic Policy Institute (ASPI) argues that a war with China would be won below the surface and that RAN ships would be "pathetically undergunned". [10] Autonomous platforms capable of acting in numbers and at depths well below those of manned submarines are a threat to warships unprecedented in the annals of naval history. The RAN needs to prepare accordingly to safeguard surface vessels and engage the enemy beneath the waves.

The ADF is acquiring a wide array of autonomous platforms, though this essay will focus on UUVs due to their wide utility underwater. Current plans to integrate unmanned platforms into the force do not go far enough, given the evolving strategic environment. The performance of the RAN in future Indo-Pacific conflicts may hinge on UUV capabilities. This essay will argue that the RAN must regard UUVs as warfighting platforms that will one day shape the underwater battle space.

AUKUS AND THE CAPABILITY GAP

The PRC's disingenuous condemnation [11] of the nuclear submarine project stems from China's fear of a more capable Australian navy with greater force projection abilities. The criticism that AUKUS is a 'military alliance' [12] is foolhardy given the close military ties that existed between members prior to the agreement. PRC concerns that the nuclear submarines will cause a regional arms race are hollow – rapid expansion of the PLAN and the militarisation of islands in the South China Sea has already caused a regional arms



A-26 *Blekinge-class* Submarine. (Image HI Sutton)

race. Ultimately, the PRC's objections to an Australian SSN fleet have unwittingly served as an endorsement of the project.

The AUKUS agreement is a milestone in relations. An observer writing for the ASPI argues that AUKUS is a "technology accelerator agreement" that facilitates the transfer of research and technology into military capabilities. [13] The US and the UK have decades of experience with nuclear submarines. Insofar as the submarine project is concerned, Australia will remain the junior partner throughout, acquiring submarine technology, designs, crew training and nuclear fuel. [14] *A Janes: Defence and Intelligence Review* analysis argues that given Australia's lack of nuclear infrastructure, expertise and issues with the *Collins-class* project, the first SSN is unlikely to enter service until the early 2040s. [15]

The ex-Chief of Navy, Michael Noonan reinforced the need for nuclear submarines, noting the *Collins-class* requirement for snorkelling would make them 'easily detectable' in an increasingly cluttered maritime environment. [16] An American Admiral cast doubts over the ability for US shipyards to integrate Australian SSNs into their overburdened schedules. [17] This highlighted the pending capability gap given the age of the *Collins-class*. Though there was talk that the US will supply the RAN with nuclear submarines in the mid-2030s [18] much remains uncertain.

If the first SSNs are more likely to enter service in the 2040s, speculation over the role of UUVs as a capability gap is warranted. Some analysts argue that UUVs could be the solution. [19] It is common to regard exciting new technology as the silver bullet. Alas, there is no evidence to suggest unmanned platforms can replace submarines in the short to medium term. A capability gap is a capability gap. The Indo-Pacific is home to formidable submarine fleets that cannot feasibly be deterred by Australian UUVs. In the long term, however, prospects for UUVs to serve as anti-submarine and anti-surface platforms could be drastically different. The technology will only improve and so will trust in these platforms.

TOWARDS 2040

Future naval conflict in the Indo-Pacific could well be more complex than we can imagine. China's hypersonic missile test in 2021 [20] demonstrated even greater technological prowess than the US Department of Defence had forecast. The People's Liberation Army's DF-21 and DF-26 "carrier killers" threaten USN task forces in the region. [21] Australia is responding in kind by investing in long range missile capabilities. [22] In any case, nuclear submarines will be a staple of any navy wishing to traverse the vast distances of the Indo-Pacific and enter contested battlespaces. An accompanying force of UUVs will bolster that capability.

Ultimately, it is unclear how UUVs will be utilised in future warfare. At the same time, banking on a future in which autonomous platforms play a mere, supporting role is folly. The decades old USN 2004 *UUV Master Plan Update* is a widely cited and visionary document that still inspires. The *RAS-AI Roadmap 2040* [23] demonstrates the RAN's own commitment to cutting edge, network centric warfare capabilities. Australia's plan looks towards the 2040s. Given the potential for UUVs, the *Roadmap* seems rather lacking. Alternatively, the 2004 *Update* looked towards 2050 and regarded UUVs as platforms ideal for anti-surface and anti-submarine operations.

The document outlined a broad range of missions for UUVs that are more relevant now in an Indo-Pacific home to potential flashpoints of conflict. [24] The *Update* suggested that UUVs could perform barrier patrol operations for US task forces. [25] A picket of UUVs could act far in advance of RAN assets and task forces, serving as intelligence gatherers and the first line of offense. Other relevant missions include the 'hold-at-risk scenario' in which UUVs loiter in enemy harbours, passively monitoring submarine movements. [26] This will be vital during a conflict in which China sorties its submarines from Hainan. Australian UUVs could also loiter in chokepoints, providing the RAN and allies with real time or periodic intelligence updates. Ultimately, UUVs could deploy to waters inaccessible to manned platforms or where the risk to Australian SSNs or allies is high.

The *Strategy 2040* lists 'likely near term' missions such as tracking submarines in ASW efforts, reconnaissance, networking and counter surface vessel operations. [27] Malcolm Davis of the ASPI

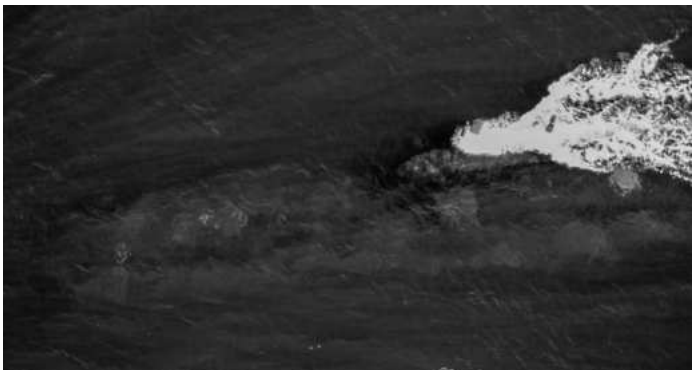


Figure 3 HMAS RANKIN (SSG 78) at periscope depth.

argues that the RAN's strategy towards 2040 missed an opportunity by planning for UUVs in a submarine tracking role, as opposed to offensive platforms for manned submarines. [28] The 2004 *Update* detailed missions involving Time Critical Strikes (TCS), in which the time from UUV to target can be measured in seconds. [29] The *RAS-AI Strategy* far term mission goal for UUVs is to launch TCS against a land-based target. [30] In time, the UUV force must be a credible deterrent to adversaries.

A more aggressive UUV capability is critically important to Australia, given huge investment in capital-intensive platforms such as the *Hunter-class* Frigate program, the nuclear submarine program, and the *Hobart-class* destroyers. [31] In 2015, China's State Shipbuilding Corporation revealed the concept of a "Great Underwater Wall" of fixed sensors and multi-class autonomous drones, that could bolster the domain awareness of the PLAN. [32] Such a network could risk detection of future Australian SSNs, operating in the South China Sea. The RAN will need to invest in UUVs that can seek enemy sensor networks and destroy them as required.

Figure 4 Anduril and RAN to Partner on XLUUV Program Port Jackson (Image Anduril).

MARITIME DOMAIN AWARENESS

Maritime domain awareness (MDA) above and below the ocean is vital. Drones will be beneficial for operations in the South China Sea, which has a 'relatively complex underwater sound environment,' [33] making submarine detection harder. Enhanced MDA would provide information on submarine movements, PLAN surface vessels and maritime militia. In the medium term, rather than hold a kinetic knife to the throat of the PLAN and risk unnecessary escalation, a constellation of UUVs operated by the RAN and regional allies would provide early warning of PLAN movements.

A future Australian SSN may only be able to operate in contested waters with a flotilla of pier- and ship-launched UUVs, forming the vanguard of the submarine. A 2014 study theorised how multiclass UUV swarms could provide underwater surveillance. [34] A complementary network of stationary and mobile sensors could form the long range underwater early warning system needed to give Australian SSNs enough time to plan for attack or room to evade.

Observers often argue that underwater drones will augment naval operations. The Swedish Navy is a case in point for a modernising navy due to its maritime domain awareness of the highly congested Baltic Sea. Sweden's next generation fleet of A26 diesel submarines

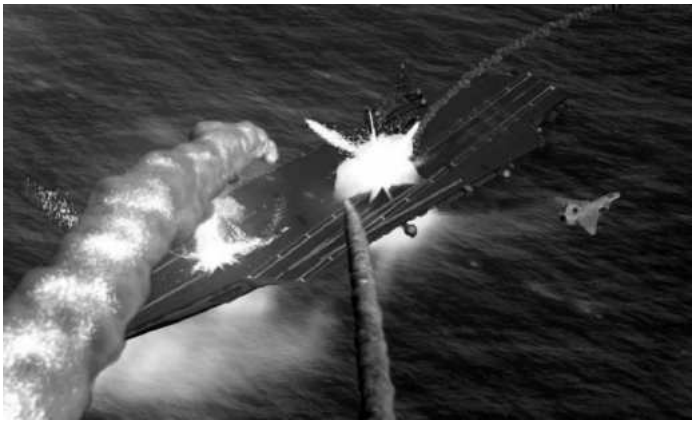


Figure 5 You Tube Screen Shot of Chinese Simulation of a DF-21 (Carrier Killer).

Figure 6 *Hunter-class* Frigate (Image BAE Systems).

have a 120cm bow tube that can deploy and recover large UUVS. [35] Commander of the First Submarine Flotilla, Captain Linden, calls for greater numbers of A26s that could in turn field 'thousands of UUVs and ROVs'. [36] While 'thousands' might seem hard to fathom, Sweden's UUV program could serve as a blueprint for the RAN. Operations involving paired autonomous and manned platforms may be more a case of symbiosis rather than augmentation.

A SOVEREIGN INDUSTRY FOR AUSTRALIA

There is opportunity for Australia to build a sovereign industrial base for these autonomous platforms and for software innovation. The ADF will conduct yearly Autonomous Warrior Exercises [37] which will allow the RAN to conduct various CONOPs. In May 2022, Autonomous Warrior on Jervis Bay allowed local and foreign industries to showcase autonomous platforms. [38] The RAN has partnered with Anduril to build three prototype XLUUVs at Sydney harbour. [39] These XLUUVs will assist in the RAN's learning curve. The ADF is embracing RAS-AI with gusto, though the RAN's paradigm for future conflict still seems to underestimate their role.

The move away from human interface towards autonomy could oscillate between a boon to the navy, at one end of the spectrum, and a downright liability on the other. A comprehensive RAND Australia report provides much needed sober analysis on the advent of RAS-AI, citing the increased risk of miscalculation through the incorporation of artificial intelligence. [40] The responsibilities of future 'men-in-the-loop' when piloting these UUVs are significant. The RAN has a critical window of time to acquire this technology and iron out the inevitable software, human interface and joint interoperability issues that will arise.

CONCLUSION

The uncertainties of the submarine project should have no bearing on that of UUV research and development. The SSN and UUV projects are of equal importance because both platforms will rely on each other. If the *RAS-AI Strategy 2040* is indicative of the RAN's classified plans for UUVs then the document needs revision. Even sophisticated primary war-fighting assets such as Hobart destroyers, Hunter frigates and SSNs may be unable to operate without autonomous drones that can deliver the initial firepower to enemy platforms. Conversely, if a future RAN task force faces superior enemy UUV swarms the results may be more underwhelming than expected. The fleet may simply retreat to the safety of territorial waters, as the Argentine Navy did in 1982, while the Australian government sues for peace. ■

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Figure 1: Maxar Technologies' Satellite Imagery https://www.navalnews.com/naval-news/2022/09/chinas-secret-extra-large-submarine-drone-program-revealed/

Figure 2: HI Sutton's drawing of an A26: https://www.forbes.com/sites/hisutton/2020/09/04/the-advanced-thinking-behind-swedens-new-a-26-submarine/?sh=fda2b1737609

Figure 3: HMAS Rankin snorkelling https://the-riotact.com/bridging-the-submarine-gap/581853

SEMPER FORTIS PRO PATRIA, NON SOLUM SIBI

ALWAYS COURAGE FOR COUNTRY, NOT ONLY SELF

By Dr Simon Reay Atkinson

The US Navy has two unofficial mottos. One, *Semper Fortis* (always courageous) recalls the US Marine Corps motto: *Semper Fidelis*, shortened to *Semper Fi* (always faithful). Its other unofficial motto has parallels with President John F. Kennedy's – himself a wartime Lieutenant USN with distinguished service in the Pacific – stirring January 1961 inaugural address *(ask not what your country can do for you – ask what you can do for your country)*, stating simply: *non sibi sed patriae* (not for self but for country). Combining the two unofficial mottos, this paper considers the loss of USS BONHOMME RICHARD (LHD 6) to fire on or about 12 July 2020 and consequent reporting and actions. It sets out the background to the fire, the main issues identified by the report, and what lessons may be learned. There but for the Grace…

BACKGROUND

I was asked at short notice by Ed to consider a paper into the loss of the USS BONHOME RICHARD to fire in July 2020. This follows on from other work I have been involved with both in academe and in Defence, as Director and Principle Investigator regarding research into failures, innovation, adaptation [1-7] and natural events, such as the 2013 Blue Mountain Bush Fires. [8, 9] A precursor event, in many regards, to the 2019-2020 Bush Fires – which, tragically, identified many of the same failings. Accidents such as that which happened in USS BONHOMME RICHARD in 2020, do not occur in isolation but in context. They are not a *tabula rasa*.

The title nods to the USN's two informal mottos formed in the days of sail, when one required courage to go aloft and to do not for self but for county. The same applies, as always, regarding fire at sea – traditionally the greatest threat to all sailors. As it relates to USS BONHOMME RICHARD, arson in royal dockyards was a crime in the British Empire punishable by death, in accordance with the *Dockyards etc. Protection Act 1772*. Before the U.S. became a republic and the First Fleet arrived in Sydney Cove. Anomalously, it remained a death penalty in the UK even after it was stopped for murder, until removed by statute in 1971.

MAIN FINDINGS

The final report of the fire [10] was not released until 16 November 2022, following the full acquittal of a young sailor by the military judge, Captain Derek Butler USN on 30 Sep 2022. The judge found Seaman Ryan Mays "not guilty of arson and of hazarding USS BONHOMME RICHARD". [A] Lieutenant Commander Jordi Torres, USN, the lead defense attorney, successfully argued that:

> this is not a close call…the evidence [does] not support a conviction. Not by a long shot. Seaman Mays is innocent…This court must find him not guilty now, and finally let him go.

The **Executive Summary** [10] reads:

> On 12 July 2020, a fire set USS BONHOMME RICHARD (LHD-6) ablaze for more than four days, and left the ship damaged beyond economical repair. Although the fire was started by an act of arson (since invalidated), the ship was lost due to an inability to extinguish the fire. In the 19 months executing the ship's maintenance availability, repeated failures allowed for the accumulation of significant risk and an inadequately prepared crew, which led to an ineffective fire response. There were four key focus areas to this final outcome:

Figure 1 USS WASP (LHD1).

Material Condition. Throughout the maintenance period, the material condition of the ship was significantly degraded, to include heat detection capability, communications equipment, shipboard firefighting systems, miscellaneous gear clutter, and combustible material accumulation. To illustrate the extent of degradation, on the morning of the fire, 87% of the ship's fire stations remained in inactive equipment maintenance status.

Training and Readiness. The training and readiness of Ship's Force was marked by a pattern of failed drills, minimal crew participation, an absence of basic knowledge on firefighting in an industrial environment, and unfamiliarity on how to integrate supporting civilian firefighters. To illustrate this point, the crew had failed to meet the time standard for applying firefighting agent on the seat of the fire on 14 consecutive occasions leading up to 12 July 2020.

Shore Establishment Support. The integration and support expected by the shore establishment did not adhere to required standards. Southwest Regional Maintenance Center (SWRMC) did not meet their requirements associated with fire safety and, in doing so, failed to communicate risk to leadership while facilitating unmitigated deviations from technical directives. Naval Base San Diego (NBSD) failed to ensure its civilian firefighters were familiar with Navy vessels on the installation, verify they were trained to respond to a shipboard fire, or effectively practice how to support Ship's Force and simultaneously integrate responding mutual aid assets.

Oversight. Ineffective oversight by the cognizant Commanders across various organizations permitted their subordinates to take unmitigated risk in fire preparedness. A significant source of this problem was an absence of codification of the roles and responsibilities expected by each organization in their oversight execution.

Accountability and Punishment – In his investigation, Vice Admiral Scott Conn USN identified 36 individuals [B] who contributed to the loss of USS Bonhomme Richard (LHD-6) on July 12, 2020. [10] U.S. Pacific Command commander, Admiral Sam Paparo USN will subsequently determine further punishments and accountability actions for the loss of the ship. [11]

Noting the failure of Admiral Byng RN at the Battle of Minorca in 1756, in his novel Candide (1759) Voltaire commented:

Dans ce pays-ci, il est bon de tuer de temps en temps un amiral pour encourager les autres – In this country, it is thought wise to kill an admiral from time to time to encourage the others.

It is uncertain at this stage the exact detail of the punishments that will be administered to all those implicated in the report and potentially subject to non-judicial punishments and whether these might apply to non-military personnel – let alone p*our encourager les autres*. The breakdown in tables 1 and 2 is nonetheless illuminating.

Table 1: Implicated Accountability and Punishment – not one ship's company

Type	Ranks	Numbers Implicated	%	Navy	Civil
USS BONHOMME RICHARD	2 x Captains 1 x Commander 1 x Warrant Officer 3 x LTCMDR 2 x Lieutenants 5 x SNCO 4 x Sailors	18	50	18	
South West Regional Maintenance Center	1 x Captain 1 x Executive Director 5 x Director Senior Public Servants	7	19.4	1	6
Naval Base San Diego	1 x Captain 1 x Federal Metro Fire Chief	2	5.5	1	1
Navy Region South West	1 x Rear Admiral 1 x Federal Region Fire Chief	2	5.5	1	1
Navy Regional Maintenance Center	1 x Rear Admiral 1 x Senior Public Service Manager	2	5.5	1	1
Navy Installation Command	1 x Senior Public Service Representative	1	2.8		1
Amphibious Squadron Five	1 x Captain	1	28	1	
Naval Surface Forces Pacific Fleet	1 x Vice Admiral	1	2.8	1	
US Pacific Fleet	1 x Rear Admiral	1	2.8	1	
US Fleet Forces	1 x Rear Admiral	1	2.8	1	
		36	100	26	10
				72.2	27.8

Overall, 56% of the personnel identified may be considered at the executive level (Captain / Senior Public Servants and above) and 44% at the workforce level – tackling the fire. For Navy personnel, almost 40% are at the executive level, and 60% at the worker level, from sailors to the rank of Commander. Although those implicated from the civil / public workforce represent almost 30% of those identified, they are all drawn from the executive and senior public service levels. Representing a potential imbalance by responsibility and authority overall, when compared with implicated US Navy personnel. Fines administered to date for the CO, Commander and Command Master Chief amount to one month's pay, spread over two months. Or about $7,500 (AUD). [11]

Table 2: Implicated Accountability and Punishment Ranks / Levels

Rank / Level	Navy	Civil	% Navy	% Civil
Vice Admiral Senior Executive	1	3	3.8	30
Rear Admiral Senior Executive	4		15.4	
Captains Senior Public Servants	5	7	19.2	70
Commander LTCMDR	4		15.4	
Warrant Officer Lieutenant	3		11.5	
Senior NCOs	5		19.2	
Sailors	4		15.4	
	26	10	100	100

THE FIRST 10 MINUTES OF THE GOLDEN HOUR

As identified during research into the Blue Mountain Bush Fires of 2013, in the event of a major fire you may have only 10 minutes to take immediate action. [8] Lessons from Afghanistan and Iraq, indicated that survivability of seriously injured personnel was significantly improved if they were recovered within the first hour: "the recommended amount of time for emergency medical services is less than 10 minutes at the location of the trauma before transporting". [12] Regarding the fire on BONHOMME RICHARD:

> At least 10 minutes elapsed after the initial detection of smoke before the casualty was called away. These precious early minutes were lost for various reasons:
>
> - the duty section primarily used personal cell phones to communicate because they lacked radios;
> - the Officer of the Deck (OOD) directed further investigation of the smoke before taking action;
> - when the OOD was convinced of a casualty, he directed Damage Control (DC) Central to call it away;
> - the 1 Main Circuit (MC) did not work in many areas of the ship to include DC Central, and;
> - there was a lack of urgency.
>
> When initial responders from Ship's Force descended into [the fire location], no one shared the same understanding of what firefighting capability was online, contributing to their failure to apply agent to the fire or set fire boundaries, which enabled smoke and heat to intensify. [12]

POLITICAL ECONOMIC CONTEXT

As nationalisation and central planning failed in the 1970s – as warned by Hayek (Mrs Thatcher's leading, 'Austrian economist') in *The Road to Serfdom* [13] – alternative political economic policies were examined. Mooted in the 1960s, privatisation took shape in the 1970s and was introduced by the Thatcher, Reagan and Hawke governments in the 1980s.

The political move from nationalisation to privatisation epitomised increasingly positive and constructivist methodologies, with their emphasis upon metricating the measurable. 1980s Privatisation

Figure 2 USS BONHOMME RICHARD (LHD6).

needed a methodology for displacing responsibility for delivery; asserting control over the levers of power (previously provided in combination with system regulation) – all under some form of professional licence. Resulting in Performance Management – ergodic [C], unit level accountancy measures designed to *optimise* existing structures, through 'continuous measured development' and evidence-based, probabilistic, unit-level managerialist-processes.

As noted by Ken Booth [14], Privatisation created a speculative hub at the centre of power. Without a philosophy or theory to bound its delivery, it could concentrate on methodology and process – outsourced to the accountancy consultancy companies. In order to accommodate political wings, methodological delivery mechanisms were required. This led to the development of three parallel processes:

1. Core privatisation of business enterprises, agencies, public services or public property from the public sector to the private sector, preferably to businesses that operate for a profit (such as telecommunications).
2. Privatisation through *Regulation* that shares or distributes ownership of a regulated market (such as energy or water) to all citizens or to employers and managers.
3. Privatisation through *Licensing* that sells all or part (retaining a Golden Share) of an organisation to a single profit or not-for profit investor who then manages the organisation on behalf of the Government.

As the process developed, regulation gave rise to *Contractorisation* and the contracting out of Government delivery functions (such as military logistics and hotel services) – supported more by the right. Concomitantly, *Licensing* gave rise to *Securitisation* of social delivery functions (such as prisons, hospitals, probation, universities, age care and policing) – supported more by the left. Finally, two tightly coupled delivery policies emerged from both wings: Public-Private Partnerships (PPPs – coupled to securitisation) and Private Finance Initiatives (PFIs – coupled to contractorisation). In the US, other factors were also at play. According to Jeremy Scahill [15], in 1988 when Dick Cheney was President Bush senior's Secretary of Defense, he initiated the process of contracting out military training, security and intelligence to private companies. Privatisation and outsourcing reached its peak during the Iraq War, when by 2007 the second largest Army in Iraq after the U.S. were Private Security Companies. And by 2011, it was larger.

DEFENCE ECONOMICS

The current Australian Defence budget is approximately $50B, about 2.17% of GDP. Applying basic defence cost modelling, the annual wages bill alone (for approximately 123,000 Defence and support personnel), is about 22% of the Defence Budget. As wages have risen, optimisation and privatisation (securitisation and contractorization) policies have placed emphasis on outsourcing and reducing numbers to sustain capability and infrastructure budgets. This has included reducing research, development and experimentation (RDE) funding to about 2.5% of the Defence budget.

Under outsourcing, the cost of overheads, pensions, and investment in personnel could be saved when contracting personnel on a just-in-time basis. Outsourcing nevertheless contains risk, since the knowledge of the workforce is no longer sovereign. The "knowledge", represents foreground IP (the 25%) and not the 75% represented by background IP. Contracted personnel were not invested in, resulting also in *knowledge stripping* – whereby knowledge otherwise retained by an organisation, returns to the parent organisation and individual, on end of contract. [16]

In major programs, lack of telos and in-house knowledge is often seen in featurism and the need for expensive post-build rework, representing up to 40% of the final budget. [17-20] In shipbuilding and software projects, rework programmes post build can cost up to 10 times the cost of installing, in / during build. In practice, risk has often unknowingly been taken at the cost of Sovereign Capability.

Applying Defence Budget Workforce costs [17, 18, 21-28], Defence is *Capability* and *Wages (crewing)* over-capitalised; while under-resourced for *Sustainment, Basing, RDE,* and *Cyber-ASD:*

- There are 1.5 ADF personnel, for every APS-Contracted member; one APS, for 2 Contractors. [26] For a Dollar spent on APS-Contracted Support, 75 cents may be spent on ADF personnel. There are 16,000 more APS and Consultants than there are RAN sailors and RAAF aviators, combined. [25-27].
- The current Defence Budget (DB) is imbalanced by its *Workforce* profile. [25, 26] *Teeth-to-Tail* ratios of 3 to one traditionally apply; suggesting the current APS-Contracted workforce could support an ADF twice its current size.
- Imbalance in the Defence Budget creates up to 55% Sovereign Risk (SR) and 45% Sovereign Capability (SC) cf. an SR of about 32 % and SC of 68% for an *Adaptively Balanced DB*. [24, 27, 29] A more balanced *Calculated DB* (2.8% GDP), has a SR of about 37% and a Sovereign Capability of 63%.

The Defence Budget may be imbalanced by workforce *(Crewing)* wage costs. [25, 26]. This raises the question of value for money; supported versus supporting; and insourcing versus outsourcing – creatures use tails foremost for balancing, not wagging. [27]

Figure 3 USS BONHOMME RICHARD (LHD6) Afire 12 July 2020.

SECURITY INDUSTRY ECONOMICS

Knowledge is human (social) and the infotechnological also [24, 30, 31]

The USN Shipbuilding profile is illustrative of the impact of Security on Industry Economics (or President Eisenhower's "Military Industry Complex"). Years of economic crisis impacted by Defence spending cuts and conflict have seen significant reductions in ship building and concomitant rises in fleet replacement rates, see also table 3.

During times of economic austerity and crisis (1972-1981) and post conflict (end of the Cold War), 1992-2001, shipbuilding rates have fallen, with concomitant increases in fleet replacement rates (greater than 50 years). The exception was the period 2002-2011, coincident with 911, the Financial Crisis (2007/8) and the Long Wars of Iraq, Afghanistan and Syria.

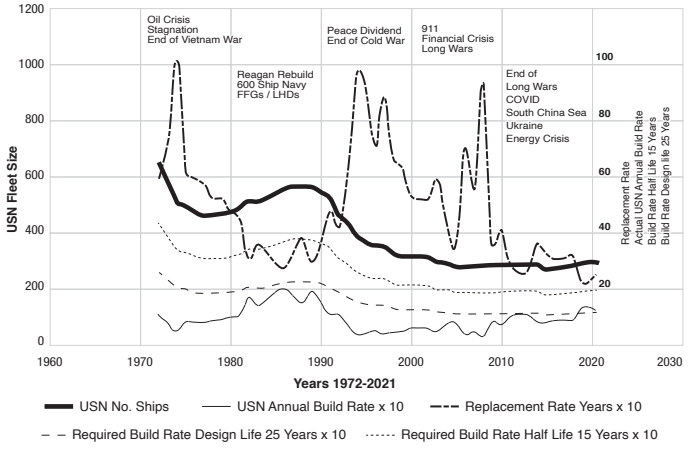

Figure 4: USN Fleet and Shipbuilding Numbers, 1972-2022 [32]

Cold War peacetime Fleets and Crewing models were configured about 25-year design life's. The impact of the Long Wars (2001-2021) was to reduce funding in fleets (maritime, armour and air) in order to support ongoing operations. Given the fact that operational demands remained the same and the world had not grown smaller, reduced funding and size and increased tempo (including in the UK) meant ship, airframe and crewing hours were being consumed at about three-times the rate they were designed for. [2] The UK was essentially running on empty from 2010.

Between 1980 and 2000, there were two serious incidents involving HM Ships (SOUTHAMPTON and BRAZEN) and between 2001 and 2010 there were seven (NOTTINGHAM, TRAFALGAR, SUPERB, VANGUARD (with FS Le TRIOMPHANT), TIRELESS, ENDURANCE and, potentially a seventh, CORNWALL). Between 1980 and 2000, there was one serious incident a decade. From 2000 to 2010, there were between five and seven such ship-life threatening incidents, on average one every two years. At the same time, the number of RN ships continued to fall. [1] Following the disastrous UK 2010 Strategic Defence and Security Review, the reduction in Royal Navy incidents may have been more due to its withdrawal from the seas, than crewing and design improvements. Noting the deficiencies of the *Type 45* (potentially replicated in the *Type 26*), the UK returned to Global Operations with its HMS QUEEN ELIZABETH Carrier Strike Group, in 2021.

Table 3: USN Fleet Size and Shipbuilding Rates, 1972-2021

	1982-2022	1972-1981	1982-1991	1992-2001	2002-2011	2012-2021
USN Average No. of Ships	398	509.2	541.9	365.8	288.2	285.2
Average Annual Build Rate	9.6	8.7	16.3	5.7	6.3	10.2
Fleet Replacement Rate (FRR) Years	45.6	61.1	34.1	69.1	51.4	28.7
Required Build Rate, Design Life 25 Years	14.8	20.4	21.7	14.6	11.5	11.4
Required Build Rate Half Life 15 Years	24.6	33.9	36.1	24.4	19.2	19.0

Following a period of reducing investment, fleet sizes and increased usage and replacement rates (1992-2011), the USN has experienced potentially the same. Probably running on empty for a similar timeframe. Since 2017, the USN has experienced four ship-life threatening incidents: US Ships FITZGERALD (2017), McCAIN (2017); CONNECTICUT (2021) and BONHOMME RICHARD (2021). Potentially five, if one includes the USS COWENS incident (of 2013). All impacting the Pacific Fleet.

BONHOMME RICHARD was the sixth of the *Wasp-class* LHD, designed in the 1970s (with the FFG) and built from the mid-1980s, during the Reagan rebuild. [33, 34] It was laid down in 1995 and commissioned in 1998. At the time of its collision, the ship was at or near its design life of 25-years.

CULTURAL CHANGE

Considering Knowledge is also about Culture and the Philosophy of an organisation, the changes occurring over the past fifty years have been existentially significant.

Placed in context, see table 4, the *Wasp-class* was a product of the *Industrial Age*, designed by grandparents *(Great Generation and Depressionals)*; built in the *Information Age* by parents (B*aby Boomers* and *Generation X*) of 2020 LHD crews (average age 23, *Millennials* and younger *Generation Z*).

There had been significant change during this period. Arguably, designs were no longer matched to the crews and the way ships were being operated and used, or the crews educated trained and applied. The basic engineering and designs of the ships had not changed – yet accident rates had increased significantly. An existential human-infotechnological mismatch (crisis?) had emerged.

Figure 5 Command Investigation.

Table 4: Generations and Scientific Ages [35]

Period	Generation (14 Years)	Current Age 2022	Scientific Age (approx 45-50 years)
1900-1914	Centennials	108-122	End of Turbine Age
1915-1929	Great Generation	93-107	
1930-1944	Depressionals	78-92	Industrial Age
1945-1959	Baby Boomers	63-77	
1960-1974	Generation X	48-62	
1975-1989	Generation Y	33-47	Information Age
1990-2004	Millennials	18-32	
2005-2019	Generation Z	3 to 17	
2020-2034	Generation Alpha	0-2	Synthetical (Cyber) Age

One of the most significant cultural changes that occurred during this period was the introduction of women to sea, for which most ships designed and built in the 1970s and 1980s were not originally configured. It is not the intention of this paper to overly dwell on this significant cultural change. Notwithstanding, there are identifiable physiological differences in performance, strength and application:

- Women have an absolute total body strength of roughly 67% that of men. [36]
- For some sports injuries, women have an injury rate (for example ACL injuries) up to ten times that of men. "In the AFL, there's one ACL injury per every 1000 playing hours. In the 2021 AFLW season, it was 3.22 injuries per 1000 playing hours (3.2 the rate of men) - which thankfully was down from the 7.5 injuries per 1000 hours (7.5 the rate of men) seen the year prior". [D]
- For perfectly understandable reasons, women have a higher attendance and referral rate to GPs than men, by as much as three-fold. [37] Meaning that if 25% of the crew is female, up to half of a sick parade may be female.
- As reported by the Guardian and the BBC, 98.5% of British fatalities and serious injuries in Afghanistan and Iraq were male, at a time when up to 20% of the deployed force was female. Meaning that men were more than 200 times as likely as women to be killed or seriously injured in combat-like operations.

Since the 1980s, there has been additional time allocated to defensive rather than professional training. Where mandatory "defensive training" in equal opportunities and diversity, is required to protect employers from potential litigation: "they should have known, and were demonstrably told so". Every year, each member of the ADF (and APS) is mandated to undertake awareness training – which takes about a day to complete. During initial training, similar courses can consume up to 20% of the program. For the RAN, this amounts to about 70 crew-years, per annum. All coming from a finite supply.

Averages not exceptions count when working time critically, en masse. Noting ship designs did not reflect current crewing and there is a limit to the amount of automation that can be applied in an emergency, changed performance expectations add complication to command and control; costing response time. Similar factors were potentially identified in the HoNMS HELGE INGSTAD sinking in November 2018 [38, 39], when any critique of female crewing was immediately shut down by the Norwegian Government.

The point is that cultural change to navies and their designs occurring since the 1980s, potentially add complication in an emergency. Assumptions could no longer be made as to averages and availability – consuming valuable minutes. At a time when time-critical standards needed to be met. Anecdotal evidence following a fatal major fire in a UK *Type 22* Frigate in the 1990s, indicated that female sailors were demoralised because they could not carry and maintain the same rate as their male counterparts, and were brushed aside. While male sailors felt let down, because they were bearing the brunt.

COMMAND AND CONTROL: RISK OR TRUST AVERSION?

Drawing on work by Alberts & Hayes [40] and Reay Atkinson & Moffat [41], it is possible to differentiate between *fidelity* (in terms of 'removing noise from an infotechnological system' (see Atlan & Cohen [42])) and *agility* (in terms of a human-infotechnological system's 'reflective capacity', also indicative of *fitness*, see DeRosa et al [43]), and the ability to 'identify mutations (noise) as a vehicle for adaptation', see Atlan. [44] This suggests that:

> *Management & Control may be a function of rules, time, bandwidth and fidelity, whereas Command & Leadership may be a function of influence, trust, collaboration and agility. [24, 41]*
>
> **Note:** that while the word 'command' is often associated with strict rules and control mechanisms, it is being used here in the military sense, where it is more synonymous with leadership.

Recognising the linkage between risk and trust and risk and resistance (as metricated) and building on work by Mumford, Blacker et al, Reay Atkinson (2012) considered that "Trust can be treated as the obverse of Risk, and vice versa". [24, 45, 46]

Following the logic of Trust being the obverse of Risk, in an ecology comprising human networks, zero trust implies infinite risk. The management of risk therefore becomes the management of trust along the obverse curve. Command and Control also becomes about the balancing of controls against trusts (and command). In an emergency, unless one has established trusts in crews, there can be no command. Without command, there is not the *fidelity* necessary for achieving control, in time.

The failure in command (leadership) and control in the BONHOMME RICHARD fire cost vital time. Leadership was finally exercised, well after the first hour and the vital 10 minutes by Commander, Expeditionary Strike Group THREE (ESG-3), the ship's operational Commander, Rear Admiral James A. Kirk, "who had no assigned role or responsibility in response to a shipboard fire during a maintenance availability. Admiral Kirk stepped into a command and control vacuum to align the various ship, installation, and external organizations by employing a make-shift emergency response organizational structure". [10] Rear Admiral Kirk and his small team were amongst the few officers to be praised and exonerated for their efforts in bringing the fire under control. They understood leadership and took command to establish the trusts necessary to fight the fire (and manage the risk) – which were largely absent beforehand.

The outsourcing and atomisation of Command and Control identified in table 2, meant that the breadth and depth necessary for leadership and the management of risk had also been dispersed. One outcome of contractorisation and outsourcing, for example, is that the Public Service no longer has a blue-collar workforce – "we are all managers now". Often with no people to manage.

A responsibility and authority gap had opened up between the ship and the nine additional organisations also responsible for the ship, in refit. The ship bore all the responsibility – but did not have the authority to command the essential resources beyond its own ship's company. Moreover, in the case of the ship the priority should have been on saving the ship. Whereas the fire authority's priority was on saving lives, at the expense of property. The organisations that had authority, did not appear to exercise responsibility over their resources and so to effectively contribute to an integrated (ship and lives) firefighting response. Critically and unknowingly, there was infinite risk exactly because there was no trust between the different organisations and the ship's command and they had competing priorities. This had to be rapidly re-instigated in the field by Commander, Expeditionary Strike Group THREE (ESG-3) and his team. By which time the ship was lost.

THERE BUT...

In the case of the BONHOMME RICHARD, it was not a matter of "spoiling the ship for a ha'porth of tar" [E], since billions of ha'porth had been spent on contractorisation, securitisation, and outsourcing. Seemingly, to the detriment and survivability of the ship and the ship's company. Observed in another investigation, led by the author and building on Bertrand Russell [47]:

If leaders don't lead; followers can't follow.

The conditions impacting the USN by 2020 can be replicated across all Western navies. Admiral Christophe Prazuck, Marine Nationale (*chef d'état-major de la marine* - chief of the French Navy) at Pacific 2017 said something like:

I need to re-shape my crews, from being rectangular just in time, to growing my sailors, technicians and engineers from a pyramid shape, over time.

Outsourcing and *Lean* crewing [F] had removed the core from many navies – for example, positions for cooks ashore were outsourced by contractorisation meaning that cooks were always at sea. With no hope for professional advancement or shore time – so they left. At great expense, this has been reversed.

Despite all setbacks, this is also a time for potential fleet renewal. Current designs are ageing and need replacing – as does the updating of US shipbuilding yards, to modern standards. The same applies to matching and fitting crews to ships, rather than shipping the fits (and crews). [33] This is an opportunity for step change – particularly if navies can leverage the scale in size and numbers (capacity) of commercial hull designs.

There are currently six different future force level projections for the US Navy, encompassing everything from a 355 to a (500) plus USN by 2045. [32] An average projected fleet size is calculated at table 5. It is by no means certain that the productivity and designs of the current ships and shipyards will enable the USN to deliver on this. Critically, beyond half-life (15 years) and towards design-life (25-years) one enters the wrong side of the bathtub risk curve, where costs mount exponentially to keep the ship in service. And the trust and reliance on courageous crews to keep ageing ships running, concomitantly increases.

Table 5: Projected USN Fleet Growth, 2022-2045

	(to) 2028	(2029-)2045
Average Projected USN Fleet Size	355	445
Average Required Build Rate Design Life 25 Years	18	22
Average Required Build Rate Half Life 15 Years	26	30
Projected Fleet Size 294	293	293
Projected Build Rate (294)	11	11
Projected USN Fleet Size 294 25yrs FRR	343	435

Currently the USN Fleet Replacement rate is about 27 years, or close to Design Life. If the current build rate is maintained at about 10-11 ships a year (through to 2045), the USN will stabilise at about 294 ships. Given the track record of the previous fifty years, table 3, this may be unlikely. Hence also the need for new, affordable (militarily, politically, and economically) designs.

There is great advantage in selling off ships at half-life – where they still have value and can be sold on to Allied navies. A form of pacification model, that maintains alliances and shipbuilding rates. It also means that the US and its allies are all fighting from and off relatively modern, common ship bases. If ships are to be sold off at Design Life (25 years), then allowing for growth 18 ships a year need to be built until 2028, and 21 a year through to 2045. Shipbuilding rates previously established between 1985 and 1987. A projected USN Fleet of 343 by 2028 and 435 in 2045 could potentially be achieved against a similar build rate for a Design Life of 25 years, achieving 355 and 445 ships a few years later than the average projected size.

Above all, the lesson from BONHOMME RICHARD and other recent accidents is that designs need to be fit for purpose and fit crews to ships, rather than shipping crews. This will require re-establishing trusts as a means also for managing existential risks. It will also need to look closely at insourcing certain capabilities and capacities where trusts cannot be outsourced, or sold on. This is likely to prove challenging and unpopular to many of the organisations and companies made wealthy through outsourcing – through the application of contractorisation and securitisation. Such designs are probably long overdue for review if we are to design our ships, crews and navies to think, fight and win in peace and war. [2]

Managers "do things right", by the book or risk register. Contrastingly, leaders like Admiral Kidd "do the right thing". Meaning managers can't manage, unless leaders lead.

The surfeit of responsible authorities for the fire, tables 1 and 2, added to the managerial burden, competing prioritisations, and cost vital time. It also reduced the trusts necessary for leadership. Without leadership, sailors could not be expected to have the trusts in their leaders to exhibit courage, do the right thing, and save their ship. This may be a metaphor for the modern world. Put simply:

1. an excess of commodified performance managerialism, tables 1 and 2, confronting USS BONHOMME RICHARD personnel on 12 July 2020, broke the trusts necessary for effective leadership;

   sine fiducia, nulla ducides

   (without trust, no leadership)

2. without leadership, managers failed to manage;

   sine ducides; nulla procuratio

   (without leaders, no management)

3. without trust and courage, the risks had (unknowingly) become infinite and unmanageable.

   sine fiducia, nulla fortis

   (without trust, no courage) ■

NOTES

A. See: USNI https://news.usni.org/2022/09/30/breaking-former-bonhomme-richard-sailor-ryan-sawyer-mays-acquitted-of-arson, 30 Sep 22.

B. See USNI: https://news.usni.org/2022/11/16/navy-releases-admirals-mast-results-from-bonhomme-richard-fire, 16 November 2022.

C. A linear and predictable (more static and less dynamic) system or processes that can be represented statistically by a reasonably large selection of measurable data points.

D. Edith Cowan University (2022) Why do female athletes seem to get more injuries than men? https://www.ecu.edu.au/newsroom/articles/opinion/why-do-female-athletes-seem-to-get-more-injuries-than-men, 18 Jan.

E. A ha'porth (half-penny) of tar in 1775 would be worth about 50 cents today. Seven billion ha'porth is worth about $3,500,000,000 or the cost of replacing BONHOMME RICHARD, today.

F. A form of commodified Performance Management, or managerialism.

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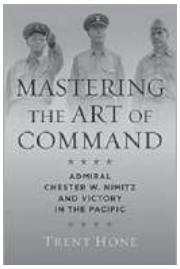

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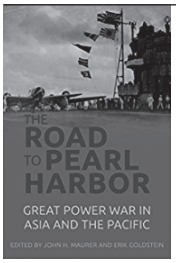
Trent Hone studied religion and archaeology at Carleton College in Northfield, MN and works as a consultant helping a variety of organisations improve their processes and techniques. He is an authority on the U.S. Navy of the early twentieth century and a leader in the application of complexity science to organisational design. Hone regularly writes and speaks about leadership, sensemaking, organizational learning, and complexity.

Hone argues in *Mastering the Art of Command* that Nimitz used his leadership skills, command talents, and strategic acumen to create the conditions for victory against Japan. He examines how Nimitz, as both Commander-in-Chief of the Pacific Fleet (CINCPAC) and Commander-in-Chief of the Pacific Ocean Areas (CINCPOA), revised and adapted his organisational structure to capitalise on lessons and newly emerging information and technologies. The main crux is that, because Nimitz served simultaneously as CINCPAC and CINCPOA, he was able to couple tactical successes to strategic outcomes and more effectively plan and execute victory at Midway, Guadalcanal, the Marshall Islands, the Philippines, Iwo Jima, and Okinawa. Whereas the Fulcrum year in the Battle of the Atlantic was 1942, in the Pacific Theatre the fulcrum year was 1943, after which the tide was turned.

Hone maintains that Nimitz was able to move beyond the Operational and from Operational Art (the employment of military forces to attain operational objectives) to strategic art (the employment of all levers of power to attain national (grand) strategic and operational objectives through the design, organisation, integration, and conduct of war). Hone also maintains that, like Nelson, he had the "Nimitz Touch", displaying deftness and subtlety in his dealings with "Admiral King and occasional conferences with MacArthur".

Hone argues that "Nimitz's campaign had *flow:* timing, movement, and opportunity all coming together in a series of integrated flows": planned operations, logistical sustenance, and the offensive execution of operations that swept the Japanese Fleet from the seas.

A book worth reading and building on. Unfortunately, Western navies learned the lessons of the Atlantic and not the Pacific, which bedevils designs, thinking, and *Strategic Art* to this day.



THE ROAD TO PEARL HARBOR

Great Power War in Asia and the Pacific

Edited by John H. Maurer and Erik Goldstein

USNI (October 15, 2022)
ISBN-10: 1682477703
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Hardcover: $60.00

John H. Maurer serves as the *Alfred Thayer Mahan* Professor of Sea Power and Grand Strategy in the Strategy and Policy Department at the US Naval War College, RI. Erik Goldstein is professor of International Relations and History, Boston University. He is a Fellow of the Royal Historical Society.

The Road to Pearl Harbor examines the conflict in the Pacific prior to the attacks on Pearl Harbour and offers lessons applicable to contemporary Great Power flash points in the Indo-Pacific. It brings together renowned historians and analysts of national (grand) strategy to map out the fateful decisions that culminated in war.

The positioning of Winston Churchill is examined by a number of the authors, and in Chapter 4, by John H. Maurer. There is an increasingly contested view of Churchill in both India and Australia. Notwithstanding, in the years leading up to Pearl Harbour that this book covers, Churchill at a very early stage raised his alarm at the threat posed from Japan. His "worst nightmare" was Japan attacking the British Empire, while the United States did not join in the fighting on the side of Britain. From an Australian perspective, the fall of Singapore and the withdrawal of the AIF fundamentally changed the relationship with both Britain and Churchill. Maurer writes, "while Churchill could not prevent war in the Pacific, he did know how it would be won".

The final Chapter *(Future Warfare in the Indo Pacific First Strike and U.S. Forward Bases in Japan)* by Toshi Yoshihara, is a sobering reality check. Yoshihara concludes: "the PLA's core institutional beliefs and values, as exemplified by the doctrine hit first and hard to seize the initiative, will only grow. It thus behoves Western observers to discern the circumstances under which Chinese leaders would yield to pressures of a first strike".

A challenging but convincing and well edited summer read.

SINGAPORE, 1941-1942

The Japanese version of the Malayan Campaign of World War II

By Masanobu Tsuji

Singapore: Oxford University Press (1988)
ISBN 0-1958891 X
Softcover: Used $25.00; New $258.00

While India and Australia might have conflicting views on Churchill both before and during WW2, the author Masanobu Tsuji maintains the fact that Japan did not have a Churchill, cost Japan the war. Tsuji in his various lives also shared some of Churchill's attributes for adventure and operating beyond the establishment.

Colonel Tsuji Masanobu (in the Asian convention) was variously a Colonel in the Japanese Imperial Army, a spy, a member of the Diet, a supporter of Chiang Kai-shek and a War Criminal. He served in Taiwan, China, Thailand and Vietnam during and after WW2. His work with the CIA assisting him escape the death penalty. He disappeared mysteriously in 1961 on an official trip to Laos. Although he was declared dead in July 1968, it was thought he might have died in the Laotian Civil War. Other rumours suggest that, given his post war liaison with Vietnam (possibly meeting with Ho Chi Minh), that he became an advisor to the North Vietnamese government.

Described as a tactical genius, a master of improvisation, the CIA thought he was "the type of man who, given the chance, would start World War III without any misgivings". And that he "had a lack of expertise in politics and information manipulation". Like Churchill, he also has a bronze statue. In his case in Kaga, Ishikawa.

The introduction to this version is provided by Lieutenant General Gordon Bennett, against whom charges were laid that he had relinquished his command (in Malaya-Singapore) without permission. A court of enquiry upheld that "Bennett was not justified in handing over his command, or in leaving Singapore" but a Royal Enquiry partially exonerated him. Tusji failed at Guadalcanal, and the fiasco discredited him. Including charges that he chose to escape the island.

The book itself is a marque of its time and written in a style – even translated – that is forthright, confronting, if engaging. It tells a story of a different time, when Japan was seeking to rid South East Asia (and India) of its European and American overlords. The planning and details he provides of the Malaya-Singapore campaign; the overwhelming Japanese victory against significantly superior numbers (by bicycle) and the way in which an ignominious surrender was orchestrated, are excoriating.

As a book detailing Japan's doctrine of hit first and hard to seize the initiative, and how it succeeded and failed it is worthy of study and thoughtful reflection. As Tsuji concludes:

> In military operations we conquered splendidly, but in the war we were severely defeated. But, as if by magic, India, Pakistan, Ceylon, Burma, the Dutch East Indies and the Philippines all gained independence, one after the other. The reduction of Singapore was indeed the hinge of fate for the peoples of Asia. It remains the case today, along with Taiwan.

THE NAVY LEAGUE OF AUSTRALIA
ANNUAL MARITIME AFFAIRS
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Submissions should include the writer's name, address, telephone and email contacts, and the nominated entry category.

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

SUBMISSION DEADLINE: **Saturday 19 August 2023**

Prize-winners announced in the January-March 2024 Issue of *The NAVY*.

HATCH: Naval Group Launches French Navy's first Defense and Intervention Frigate (FDI) FS AMIRAL RONARCH (D660).

MATCH: ADV *Reliant* wearing His Majesty's Australian White Ensign following flag raising ceremony August 2022. (Image SGT Peter Borys)

DESPATCH: USS ST LOUIS (LCS-19) Commissioned in 2020 being considered by Congress for Decommissioning in 2023 along with 39 other US warships.