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THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

A 'READY RESERVE' FOR THE RAN

BECAUSE WE'RE WORTH IT?

RAN SHIP PROPULSION: FROM SAIL TO TURBINE

A HISTORY OF AUSTRALIAN NAVAL SHIPBUILDING, 1949-2023

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Volume 85 No.4

THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

Front cover: USS CANBERAA (LCS 30) Commissioning Fleet Base East Garden Island 22 Jul 23 alongside HMAS CANBERRA (L01) Image SRA. Also shown NLA designed AUKUS and QUAD Navy Marques and NLA Designed Blue Ensign for Australian Defence Vessels (ADV) and RAFA, and Army Colours for its Littoral Manouevre Force, as a Blue Ensign.

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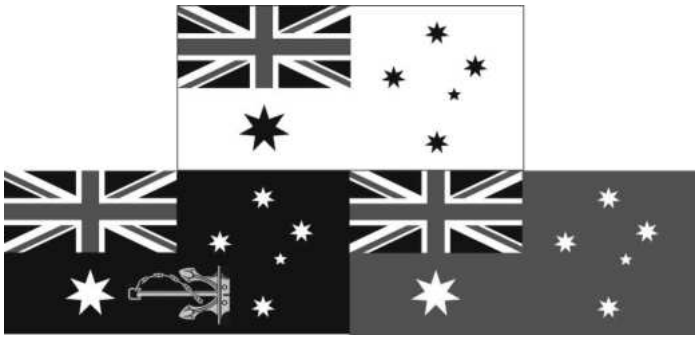
AUKUS on a 2013 Defence Budget

The final issue of a long 2023, commences with a paper by Dr Simon Reay Atkinson entitled *Because We're Worth It?* which addresses ADF crewing. Simon raises several issues regarding "the promotion of identity – potentially above that to Country, Crown, and Commonwealth?" He considers actuarial and gender-based crewing – with potential implications for thinking, fighting, and winning "on war". The paper examines the transition from third wave feminism ("taking the toys from the boys") to fifth wave feminism, which he suggests may be more akin to "taking the boys from the toys?" Perhaps, previously un-controversially, he posits:

> *Equality is based equably on successful male participation. Potentially more so in conflict or crisis.*
>
> *Prima facie, successful female recruitment – and retention – is based on male participation, and productivity.*
>
> *Over a career, considering there to be no differences between choices, aspirations, and outcomes, helps neither women; nor men.*

The second paper by Dr Neil Baird and Robert Blake takes forward previous suggestions for a Royal Australian Fleet Auxiliary (RAFA), see Greg Swinden, B*ack to the Future – the need to recreate the RAFA* (*The NAVY* (Vol 85, Iss 3, pp. 23-25)) with those looking at crewing and sustaining an emerging "Big RAN". Neil and Robert identify that, what they call "the People's Liberation Army Maritime Militia (PLAMM), is what really should be frightening Western naval planners. Its size is difficult to gauge and its effectiveness, preparedness, and readiness, impossible to measure. However, rough estimates are that it comprises well over 100,000 vessels and many more than a million personnel". In addition to proposing a RAFA and supporting industries, they submit the *Three Flags ANSON Model*, [1] which enables "the healthy flow of crews and platforms between grey-funnel ships (the White Ensign), with Red and Blue Flagged vessels. It is underpinned by the application of modern commercial platforms and crews in their military and auxiliary capacities – and vice versa."



***Three Flags Model* Incorporating NLA – The *NAVY* designed Blue Ensign – maintaining the essential capital, personnel, and capability flows. [1]**

Baird and Blake conclude, *inter alia*:

> There is much that can and ought to be done quickly and relatively cheaply to improve our naval defence readiness. The problem, as always, is developing or inspiring the political will and the imaginative, adaptable naval leadership to make the necessary practical decisions no matter how distasteful they may be. To be better prepared for war, Australia must ensure that Canberra's blinkers be removed. Its defence, particularly its maritime defence can be achieved by rejecting or reforming much of its wasteful and tediously slow conventional 'wisdom'.

Paper 3 marks a welcome technical paper by returning author Dr Dario Delgado, examining "RAN Ship Propulsion – from sail to turbine". Something of a romp through propulsion history, Dario notes AUKUS as being a trilateral agreement that will assist Australia in acquiring nuclear propulsion which brings several advantages, such as high range and stealth. He notes that "the RAN is diversifying and enhancing its capability which is aligned with the excellence of ADF values. The RAN has learned to close the gap between state-of-the-art technology and the currently employed RAN technology." He concludes:

> Since the RAN's foundation, the propulsion technology employed in RAN ships has mostly been decades behind and highly dependent on allied support. The AUKUS agreement will assist in closing the propulsion technology gap, making the RAN more independent and bringing far superior war capability.

The final paper, also by Dr Neil Baird, is the second of his papers, this time covering the period 1949-2023. The papers were taken from his forthcoming book *Australia and the Sea: An Encyclopaedic Maritime History*, expected to be published in 2025. An erratum was kindly pointed out by a reader – see letters. Dr Baird welcomed this correction and recognises that the list is not exhaustive. For example, HMA Ships BOONAROO and JEPARIT are not included. Notwithstanding, Neil maintains his critique of the RAN (including in paper 2), noting:

> Another odd Christopher Pyne acquisition is ADV *Reliant*… embarrassingly in action in Cairns. Despite paying five times its market value for this ship, it is incapable of getting out of its own way when operated by Navy personnel. Even though, with its twin *Aquamaster AZDs* and three side thrusters, it could be parked sideways by a 10-year-old, it required tug assistance to berth on a calm day in Cairns.

Neil recalls the advice by General Sir John Monash in the 1920s – increasingly pertinent today regarding the *Hunter-class* and *AUKUS-class* submarines – that "building in Britain [or U.S.] would represent an estimated 50% cost and time saving over local construction". Given timelines, slippages, and costs – the iron triangle of budget, schedule, and scope – Australia may be wise to buy and build its major capital capabilities from the U.S. and UK – and concentrate on what it can and should be doing today, i.e., for delivery in the 2025-2027 timeframe.

CUT TO THE BONE

As has become increasingly obvious to all but the most benevolent commentators, the Defence Strategic Review represented an annual compound cut of between 8.5 and 10 %, until 2028. When future Governments are expected to increase Defence spending by between five and six percent, per annum. The Deputy Prime Minister and Minister of Defence, Richard Marles, failed to secure the additional funds necessary to deliver the DSR.

HMAS AUKUS (S235) – AUKUS on a 2013 Budget? (image BAE Systems)

It may be possible, up to a point, to forgive the authors of the DSR (namely Smith, Houston, and Dean) for recommending the budget to go with their DSR – but failing to fight for it. Notwithstanding, knowing how the ALP, PM&C, DFAT, and Treasury work, Smith and Houston should have known better. Peter Dean, the lone academic, may be able to claim ignorance – although that is no defence. What no author can claim, is that they fought for the DSR to be properly funded. Politically, they may now have been conveniently positioned in "grace and favour" jobs – such as at The British High Commission (Smith), and the Governments funded *United States Study Centre*, at the University of Sydney (Dean).

The combined effects of cuts, freezing, and defence inflation is to reduce the Defence Budget in real terms to about 1.6% GDP, by 2028 – to where the budget was in 2013. See DSR and Surface Fleet Review (SFR) critiques undertaken by *The NAVY* Defence Analysts (*Flash Traffic*, Vol 85, Issues 2 and 3). It is akin to attempting to build AUKUS on a 2013 Defence Budget – as exemplified by the decision to put off an East Coast Submarine Base until 2032.

A LEADERSHIP LOST?

Readers may recall the long line of USSR President's, from Khruschev through to Chernenko – each seemingly older, and more wooden than their predecessor. Their average age in office was almost seventy, with three of them (Brezhnev, Andropov, and Chernenko) dying in post, at 76, 70, and 74 respectively. By the time of his death in 1982, Brezhnev had been in power for seventeen years.

The leadership looked old and past it – waxen figures, annually wheeled out to appear at the Red Square, May Day and Victory parades. None of them seemingly able to grip or understand the momentous changes occurring, at least in their later years. Particularly when confronted with a vibrant 70-year-old President Reagan (in his first term) and Mrs Thatcher, aged 54 on coming to power.

Fast forward to 2023, and it is the United States that looks increasingly shaky – represented, potentially from 2024, by a fragile octogenarian, or an 80-year-old to be. With ages, on coming to office in 2025, ten years older than latter-day Soviet Presidents. How has the U.S. come to this – how can it be healthy for any Government, or democracy? Leaving the reader to decide, the leadership choice of the Western world appears to be between the "demented, the delusional, and the delinquent," or combinations thereof. In other words, no choice at all. Xi Jinping and Vladmir Putin, by contrast, are sprightly 70-year-olds. No matter what we might think of them, both on top of their game – when compared to the two likely prospective 2024 Presidential candidates.

The *No Limits Axis* along the 120˚E Meridian, GMT + 8hrs – connecting China's Antarctic Belt, through Australia, the South China Sea, China, and Russia-Siberia, with the Arctic (image NLA©2023).

HOW DOES THE BEGINNING END?

Bob Carr's arm of the ALP appears to accommodate a more Sino-centric view of the world, which may be what the DSR ends up delivering: "appeasement without benefits?" Noting agreements between the Solomon Islands and East Timor, the West is being outpaced. In the South China Sea, in Antarctica, in space, in cyber, and in the region – potentially creating a *No Limits Axis* (NOLA) across strategic and contested WW2 spaces.

Wars in Europe never stay in Europe

In Europe, the Ukrainian war continues. The longer it goes on, the more likely it will spill over into the Middle and Far East. As in Hamas genocidal attack on Israel. As did the seven-year war (1756-1763); the Napoleonic wars, and the first and second world wars. There appear to be no western statesman able to elucidate a peace process – no matter how imperfect it may be. At the same time, the West is struggling to rearm itself and Ukraine – the U.S. more so, given its seemingly systemic societal divisions, debt, exposure of the dollar, and relative decline (see Flash Traffic). Exacerbated by moribund defense industry designs, builds, and shipyards The U.S. might be unable to be the arsenal it once was. For example, providing *Virginia-class* submarines to the RAN, as envisaged under AUKUS.

The West may yet recover, as might the U.S. – although it is by no means certain, and unlikely in the near term. We are out of time. The Defence Strategic Review and Surface Fleet Review may do more harm than good. Stripping away what few remaining years Australia had to prepare for and deter China. The die is cast. As Jim Molan and Mark Schweikert concluded four years ago:

> "We will have to fight with what we have got" – and what we have got, is not a lot! ■

REFERENCES

[1] ANSON, *Surface Fleets Flexible Re-Scaling. The NAVY* - Journal of the Navy League of Australia, 2020. Vol 82, Iss. 1, Jan-Mar.

STATEMENT OF POLICY

CURRENT AS AT 1 JULY 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.

FEDERAL COUNCIL & AGM

Our Federal Council and Annual General Meetings are fast approaching and this year our members have spoken and we have listened. We are back to meeting in person and due to popular interest, the meetings will this year be held in Sydney on Saturday, 21 October 2023. As most of you will know that will be Trafalgar Day, with the opportunity to get together to discuss maritime issues as well as to make the most of the Sydney maritime scene for those delegates who have not been to Port Jackson for some time.

The Annual General Meeting and Federal Council meetings of the Navy League provide the opportunity for dialogue between Federal Council and the Navy and the opportunity for briefings on current issues, future plans and issues that the League sees important to address. At the meetings representatives from each Division of the League, and representatives from our New Zealand counterparts come together to address matters of import, and also to meet socially, discuss issues affecting the League and its direction and enjoy each other's company.

There is a notice in this edition detailing how members can participate in this year's Annual General Meeting. We hope you can join us in person, though if not please get in touch. We will be conducting a hybrid version of the meeting again this year, so those in Sydney can join in person while others who wish to join 'on line' will be able to enjoy the meeting via videoconferencing.

Many of you will be used to this format of meeting, so we hope you will join us.

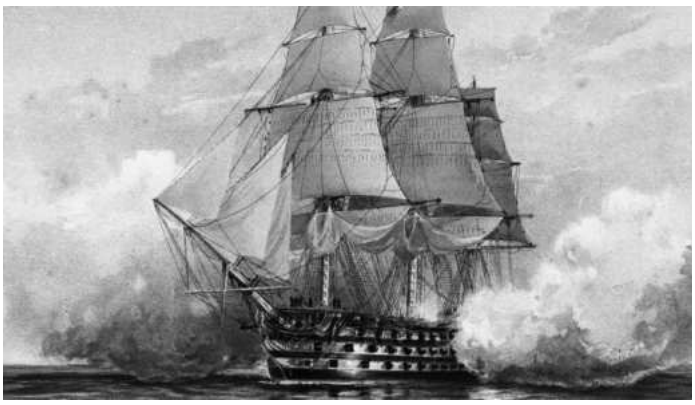
The AGM is also a great opportunity to further explore, in more detail, the important issues which are canvassed in this *The NAVY: The Journal of the Navy League of Australia*, to address emerging naval matters and mix with like-minded members. I encourage all members to participate in the AGM, and hope many of you are able to join us.

THE NAVY LEAGUE OF AUSTRALIA ANNUAL MARITIME AFFAIRS ESSAY COMPETITION

Entries in the Navy League of Australia Annual Maritime Affairs Essay Competition have been received and the competition has closed for another year. Once again we are very pleased with the quality of the contributions and we thank all of you who have participated. One of the tasks of the AGM is to review, assess and make the difficult decision as to prize winners for the competition entrants. That process has begun and in due course the decisions will be made and announcements will follow.

For those of you who missed the deadline this year, details will be out soon also about the competition for the year ahead, so if you are interested in participating, you can get a head-start preparing your paper now. Topics can range across 21st Century Naval Warfare, Australian Naval History, Australian Industrial and Merchant Navy Maritime Strategy, and around all of the subjects which you read about in editions of *The NAVY*.

The annual competition offers prizes in the professional and non-professional categories and the opportunity to have the papers published in a future edition of *The NAVY*, as well as the lure of the substantial prizes on offer.



HMS VICTORY at Trafalgar 21 October 1805 - The Immortal Memory (Image Royal Museums, Greenwich).

For those of you who have contributed entries, we thank you. We will announce the winners in the edition of *The NAVY* following the AGM.

THE YEAR AHEAD AND THE FUTURE OF THE NAVY LEAGUE

Another topic that we canvass at the Federal Council meeting is the League's Statement of Policy for the maintenance of the Maritime wellbeing of the nation, which you will find in the front of *The NAVY* magazine. Please review the Statement of Policy and if you have suggested changes, additions or amendments let us know. Everyone's contribution is welcome in this most important task of 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.

We will also be reviewing the way ahead for the Navy League, so if you have a view on that let us know ahead of the meeting, or even better, come along and join in on the day.

ISRAEL

As we go to print, Hamas has launched a surprise attack on Israel. We think of our Israeli friends, who have previously contributed papers to *The NAVY* on the IDF Navy. Stay strong.

IN THIS EDITION

This edition is once again stacked with great reading for you. Remember to make a note of your views as you read and put pen to paper and let us know what you think. We welcome your contribution to the debate.

Happy reading. ■

Hi [Aeneas]

I wish to complain about an article in the current *The Navy – A History of Australian Naval Shipbuilding, 1911-1948*, contains many errors.

The major ones are:

1. HMAS SWAN I (page 27) Not a sloop – was a torpedo boat destroyer. Swan II was the sloop on page 30.
2. HMAS BATHURST I (page 28) Sixty built not 50.
3. HMAS BEACONSFIELD I (page 28) Not a *Bathurst-class* minesweeper. Was there ever a RAN vessel named BEACONSFIELD?
4. HMAS LABUAN (page 29) LABUAN I was not US Navy. It was a Royal Navy LST3.

The Author states "Those ships that performed notably in action or whose construction successes or, more commonly, failures, deserve praise or caused controversy are described below." This article has a list of RAN vessels that does not match the shipbuilding criteria as it includes imported vessels. In terms of Australian build or war service of major warships, the list is not comprehensive.

Some entries seem out of context, especially the likes of modern vessels when the article's sub-heading finishes at 1948. For example, HMAS MANOORA II (page 29) commissioned in 1994. Others such as HMAS KARANGI (page 29) were included as its claim to fame was "Was a sister ship to HMAS KANGAROO".

This article fails to match your normal standards.

Regards

Hayden Williams

Dr Neil Baird writes:

Aeneas,

Mr Williams is partly correct, as are most nit-pickers, but we should thank him for his help in improving the accuracy of the book.

1. SWAN I was indeed a torpedo boat destroyer.
2. There were 60, not 50, *Bathurst-class* ships.
3. There was no BEACONSFIELD, I suspect I confused it with the nearby Tasmanian town of Deloraine.
4. LABUAN was actually built in Canada for the RN as an LST but all other comments about the ship are correct.

[Mr Williams] hasn't read the intro para properly. The list nowhere excludes imported ships. In fact they are specifically referred to – noting that imported ships have generally been better than locally built, except where modified by the RAN. I would have thought, also, that it makes it plain that the list is a selection and does not claim to be comprehensive. That would take a book.

"Out of context" is a fair comment and is a result of the alphabetical to chronological order conversion [that the edited versions of the single book chapter created]. As discussed.

Anyway, the case propounded in the article remains unchanged.

Mare Liberum

By Editor,

In order to accommodate a long book chapter at almost 9000 words, I took the decision to create the alphabetical to chronological order presented in the two papers. This created an element of incoherence, for which I take responsibility. Notwithstanding, may I thank both Mr Williams and Dr Baird for entering into the spirit of *The NAVY* and ensuring we are suitably critiqued and maintain our normal high standards.

I expect a paper from Mr Williams in the near future.

Kind regards

Aeneas

Editor

The NAVY – Journal of the Navy League of Australia

Dear Sir,

Thank you for the Jul/Sep edition of The NAVY, p. 27, mentions the sinking of the EMDEN – many other [papers] say the SYDNEY sunk the German Light Cruiser.

We know that the German cruiser was run aground; continued to be shelled by the Australian ship, until the enemy surrendered. Thank you.

I have a question – "why does the famous sinking of the Titanic get a lot of media coverage, when there was much heavier loss of life in ships such as the BISMARK, HOOD, and 10,000 lost when the *Wilhem Gustav*, a German passenger liner, was sunk by a Russian submarine in WW2

Would readers like to comment?

Thanking you

Pat Rafferty (79)

Dear Editor,

I am writing reference to *The NAVY* Vol 85, Iss. 2.

As an ex-military man, 83 years of age (British Royal Armoured Corps), I still take an interest in developments, especially here in Australia and New Zealand – I have citizenship in both countries.

I share your feelings of frustration, anguish, and can I say despair? At the antics of those trusted with the job of acquiring suitable military equipment for the nation. I know that for 20 years and more successive ministers and advisors have failed time and time again to buy or build what is needed to deter a potential enemy from attacking us. It even crossed my mind to ask every politician to swear they have no connection to the CCP or hope to see a communist government in Australia, one day. But of course, our modern Australia that has rejected God and teaches humanism in our schools and universities (the education of, amongst others, [leading Nazis]), no one can be expected to tell the truth anymore. Even if asked to swear on the Bible.

I do like the idea of uprated *Arafura-class* corvettes. I have done some designs for a corvette myself. I called it an Assault corvette – able to carry a few marines [Army Commandoes?] to be landed in a *Cayman-class* tracked landing craft, with a crew of 3 + 12 Commandoes. I sent drawing to a politician to give a rough idea of what they would look like. But got no reply!

Also my idea of extending the rail line from Cloncurry to Tennant Creek – to allow fast transportation of troops (and logistics) from Townsville to Darwin, in the event of war. The idea went down like a lead balloon.

Questions. What is *Sea Ram* for the corvettes and a *Nulka*? My design was to have a planar radar and a hull that could carry two Phalanx defence systems and a 76MM *Otto Malara* gun, and homing torpedoes.

Wishing you well and hoping I don't have to learn Chinese!

I am, yours faithfully,
A. Simpson

.....

By Editor,

Dear Mr Simpson,

Thank you for you letter – we must at all costs avoid cynicism and hubris if we are to lead our country through the current dark seas to the sunny shores..

Kind regards
Aeneas

Sea Ram (Rolling Airframe Missile) on a Phallanx CIWS Mounting.

Nulka Decoy Missile Mystem with Phalanx CIWS.

NOTICE IS HEREBY GIVEN THAT THE

ANNUAL GENERAL MEETING
OF THE NAVY LEAGUE OF AUSTRALIA

The AGM will be held in Sydney on Saturday 21 October, 2023, at 10:30 am AEDT, NSW State Library.
Please register your attendance (and your email address) by email to editorthenavy@hotmail.com
by COB Tuesday 17 October additional details will be emailed to you prior to the meeting.

BUSINESS (0930 SATURDAY 21 OCTOBER)

1 To confirm the Minutes of the Annual General Meeting held by video conferencing on Saturday 22 October 2022

2 To receive the report of the Federal Council

3 To receive the financial statements of the year ended 30 June 2023

4 To elect Office Bearers for the 2023-2024 years as follows:
- Federal President
- Federal Senior Vice-President
- Additional Federal Vice-Presidents (3)
- Honorary Federal Secretary

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

5 **GENERAL BUSINESS:**
- To deal with any matter notified in writing to the Honorary Secretary Queensland Division, PO Box 620 Morningside QLD 4170 by 15 October 2023

ALL MEMBERS ARE WELCOME TO ATTEND

By order of the Federal Council

Matthew Rowe
President

BECAUSE WE'RE WORTH IT?

By Dr Simon Reay Atkinson

Given the devasting Russian war on Ukraine, but also western military experience in Iraq and Afghanistan, it is perhaps timely to reexamine peace and war time crewing of western militaries. Including application of gender and identity-based recruiting and selection. Extending, in more recent years, to outcomes-based affirmative action and the promotion of identity – potentially above Country, Crown, and Commonwealth? Recognising the exceptional contribution and role provided by women of all ranks, across the ADF - this paper considers actuarial, gender-based (male/female, men/women) crewing, with potential implications for thinking, fighting, and winning on war.

NOTHING IS FAIR IN LOVE AND WAR

According to UK MoD sources, the Iraq and Afghanistan wars between 2002 and 2014 led to 632 military deaths, of which:

- The average age was approx. 27.8;
- 10% Officers; 13% NCOs; 77% Other Ranks;
- Army approx. 80%; Royal Navy and Royal Marines 13%; RAF 7%.
- Approx. 98.5% Male;
- Combat Field Hospital Admissions approx. 7,100;
- Wounded in Action, approx. 2,200
- Serious Casualties 607
- Most Seriously Wounded 305
- CASEVAC, approx. 7000

During both campaigns, although comprising 10-11% of the UK Armed Forces, up to 20% of those deployed were female. Examining the statistics, while women were up to twice as likely to deploy as males, ninety-eight and a half percent of fatalities (and injuries) were male. Indicating men were more than 250 times more likely to be killed in the conflicts than females – war is neither fair nor equitable.

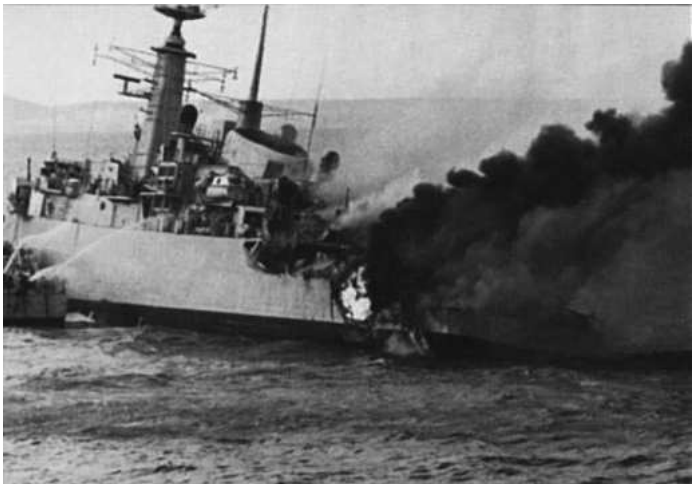
Outcomes-based, *Fifth Wave Feminism*, (a) also extolled front-line positions for women. Potentially raising ethical questions as to whether this is what is wanted, or needed? Perhaps placing the price of outcomes over opportunity?

Putting war to one side, there may be other agendas to do with the assertion of control. In a reversal of *Second* (1970-1980s, (b)) and *Third Wave* feminism (1990s, (c)), "taking the boys from the toys," rather than "toys from the boys". In so doing, affirming control e.g., through the setting of outcomes-based affirmative action.

More recently, the Russian War on Ukraine has tended to confirm that males are doing the dying, at least on the front line. That is not to say women are not doing vital roles in the conflict.

> Of the 50,000 Russian soldiers thought to have been killed: they were identified by a huge spike in the ages of 20 to 24, in male deaths compared to female deaths. "We" were then able to compare it with the data for Rosstat, which is the [Russian] Federal Statistics Agency, and our estimates were in line with what we got from the Rosstat data for 2022. (d)

There is little Russian reporting of servicewomen killed in action. On Ukraine, numbers vary. The US DoD estimate to May 2023, is that 20,000 UDF soldiers have been killed – of which, according to Ukrainian sources – one hundred and seven were women. (e) Ukrainian agencies report 10,000-13,000 fatalities. Set against the UKAF experience in Iraq and Afghanistan, female service personnel losses in Russia's war on Ukraine would appear similar. Suggesting female deaths in contemporary conflict may be in the region of 1-2%.



HMS ARDENT (F184) Ablaze and Sinking, Falkands war 1982.

There are other matters, to do also with reproduction, childbirth, and that after the start of the war, males between the ages of 15 and 44 were prevented from leaving Ukraine. Notwithstanding, of approximately 700,000 active personnel, 42,000 (6%) are indicated as being female. That is about half (as a percentage) of females serving in the UKAF between 2003 and 2012, and less than a third of women currently serving in the ADF (19.7%). (f) Without knowing the proportion of women deployed on the front line, it is not possible to calculate the ratio of male to female losses. *Prima facie*, it may be considerably higher than 250 males, for every female fatality.

WAR AT SEA

A view has, perhaps, emerged suggesting that war at sea is somewhat less than war on land. Or that it can be automated. Some changes to gender-based selection criteria, may be indicative.

The previous Chief of Navy recognised, at some point Navy is going to take losses. At which time, it will be necessary to fight on – possibly leaving behind crewmates. This will be hard to do. Unlike Army, there is little prospect of "walking" away.

During the Falklands War, HM Ships SHEFFIELD, COVENTRY, and ARDENT – with all male crews in the region of 650 sailors – were lost in action (see (g)). Almost 1/3 of the crews (32%) were killed or injured: approx. 10% killed, and 22% wounded. (h) At one fatality for two injuries, this is 67% higher than the rate for classical land conflicts, at 1:4.

Lessons learned from WW1 indicate that, beyond a loss (attrition) rate of 25%, units stop performing coherently. Other analysis (reinforced during COVID), suggests a 15% incapacitation rate can impact up to 30% of a capability. A factor of two-to-one.

The Burnt out Wreck of *MV Atlantic Conveyor* prior to Scuttling.

ANALYTICS AND DAMNED STATISTICS

Omar Bradley stated "amateurs talk strategy, professionals talk logistics". By the same token, "strategists talk statistics - basing their decisions on the analytics available to them".

The statistics of modern war, as set out above, appear to indicate that wars will continue to be fought by young men. It is young men, by this analysis, who appear more expendable. Whereas, increasing the proportion of women serving in the military may satisfy political, gender, and outcome/identity-based aspirations – it might also reduce the available warfighting pool. Depleting, proportionally, those men available and able to be deployed to, and sustained on the front line. This, at the very least, should be sounding warning bells in the minds of politicians and ministries, who may shortly be sending young people into harm's way.

Analysing the ADF, there are currently reported to be 60,300 active members. Based on the current proportion of females to males (19.7% to 80.3% overall), and retention rates (developed below), the average age (on joining at nineteen) of a male may be 26.4 years, and a female 24.8 years.

Noting an ageing workforce as fewer join; the removal of pensions (meaning people stay longer), and later joining ages (for officers, the average age of joining may be about 24, and sailors twenty-one), a RAN officer average age may be closer to 32, and a sailor nearing twenty-nine. In rank terms, the face of the Navy may currently be a Lieutenant Command / Chief (or) Petty Officer – whereas previously it was a Lieutenant or a Leading Hand, in their mid-20s. This is important, since the average age is a key indicator of the health of the ADF. [1] [2] By this metric, Navy – at least – may be going in the wrong direction.

To sustain (not grow) a military force of 60,300 over an active full career of thirty-five years requires front end recruitment of thousands of men and women. The "decay (or lifecycle) rates" of such populations appear immutable. Interestingly, Roman Army tablet records at *Vindolanda*, on Hadrian's Wall (i), seemingly indicate similar lifecycle and force dispositions.

Broadly, an average decay rate of about 88.3% per annum exists for all Service personnel, from their start of career. Often given as a retention rate of 12.7%. Noting the significant reduction in the first two years of training, Defence generally applies the retention rate to the trained strength, where it is less (than 12.7%) – typically, quoted about 9%.

According to a comprehensive study released by the U.S. Government Accountability Office (GAO), the U.S. Armed Forces reported that between fiscal years 2004 and 2018, women were 28 percent more likely than men to leave the U.S. military service. (j) Using this as a yardstick, it is possible to suggest that the male retention rate (from entry) may be about 89% (11%) and for females, 86% (14%).

This is important, because it sets employment moments, break points, opportunities, and progression later in career. For example, the *half-life* (or career) of a male service person may be about 5.9 years – meaning that almost two-thirds of males will receive the Australian Defence Medal (ADM), at four years of service – 2-years on the trained strength. Whereas, the *half-career* of a female Service person may be about 4.5 years, meaning up to half of all female service personnel may not receive the ADM. For this reason, in 2018 the ADM started to be awarded to female service personnel two years earlier than their male counterparts – when two-thirds of joiners may still be serving.

OUTCOMES VERSE OPPORTUNITIES

This may be where *Fifth Wave Feminism* / critical identity theory (CIT) / *identitism's* focus on equal outcomes, more than equal opportunities, might be heading – e.g., recent Industrial Relations legislation. In terms of *equability* (and equity), males must serve 4 years for the Australian Defence Medal recognition; whereas female service personnel may serve only two. Meaning that almost 20% of women will be awarded an ADM on completion of training (typically 2 years) but leave before they join the trained strength. A gender-based ADM might not equably recognise service, or act as a reward, or retention factor. Potentially devaluing the ADM.

The issue of equal opportunities versus equal outcomes will be examined later. Seemingly, it pits *Second Wave Feminism* (Women's Lib, based upon equal opportunities), against outcomes-based *Fifth Wave Feminism*. With "critical" implications for all institutions, merit-based renumeration, and selection. An equity-based solution to the ADM question, might have been to issue the medal to all at 2 years, with a bar at four.

A DIGRESSION

The wonderful *Matildas* soccer squad may provide a useful digression.

The squad comprised 23 players and fourteen support staff (managers, medics, physios, therapists, analysts). The 23-squad (making up two full teams), appears to be modelled on a typical male team. Male impact injuries, for example including ACL, appear to run at a risk factor of between 0.5 to 1% (99-99.5%) for elite male athletes. Applying this risk factor to a male squad, indicates that they may be a player down at any one time. Providing two full teams (of 22 players) for the manager to draw on, with over 95% confidence. A reliability factor (95% plus), that lends itself to a 23-crew squad.

ACL and other impact injuries may occur at between 7-10 times the rate for female, as for male athletes. (k) Applying this factor to a female squad of 23, there is a 13% probability that 22 fit players (two full teams) will be available. The coach may need to factor in that three players are unavailable for selection. Readers will recall that, at one point in the recent World Cup, the *Matildas* were down four of their squad. Meaning that two full soccer teams could not be generated.

HMS COVENTRY (D118) Ablaze and Sinking Falklands war 1982.

Mitigation based on statistical analysis, suggests a female soccer squad may need to be 26-strong, to reliably generate twenty-two players (two full teams). Due to biomedical / physiological factors, confidently available for about 85% of the time.

This is important for managing all teams and no fault of the exceptional *Matildas*, or any players. It's just the way it is. For the reasons set out above, an outcomes-based assessment might reasonably conclude that equivalent female soccer squads should comprise 26 players. Thus, providing selection (of the fittest available) and consistency of output. It does come at a cost of an additional 13% in wages and other overheads to support 26, as opposed to twenty-three players. Including, possibly, sixteen (as opposed to 14) support staff.

The outcomes (as opposed to opportunities) based focus on equivalent wages is, perhaps, best left for another day.

BELOW THE LINE?

There are several physiological factors in play. According to the *Journal of Exercise Physiology*, (l) women on average produce about two-thirds the amount of total strength and applied force that men produce. Women are also physically built, so that they generally carry two-thirds as much muscle mass as men. Men are on average stronger than women, based largely on body size and muscle cross-sectional area. (m)

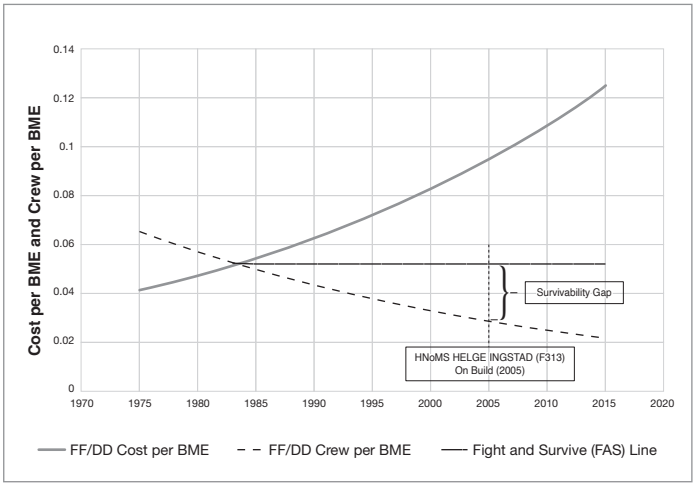


Figure 1: HNoMS INGSTAD Significantly Below the FAS Line, [3, 4] RCB©2019

As reported in *The NAVY* (Blake and Morant [3-5]), HNoMS HELME INGSTAD (F313) raised questions about the survivability of modern, large frigates and destroyers. Reporting and enquiries regarding the role of women in the collision and failure to save the ship, were not released by subsequent inquiries. Questions were also shut down by the Norwegian Government and Navy. (n)

According to RC Blake, [3, 4] HNoMS HELME INGSTAD had a crew of 137 at the time of her sinking. This was 91% of its lean-design crew size. Blake also suggests that, due to underinvestment in surface ships (as opposed to submarines) and lack of automation, the ship was potentially operating well below its "survivability line." For which, he suggests, a *fight-and-survive* (FAS) crew of 275. In other words, the ship was being crewed at fifty-percent its design FAS, see figure 1, and table 1.

Lean-crewing applies to most modern western warships.

Norwegian data on the crewing of its warships is hard to track down. A figure for the Norwegian Armed Forces is 15%, mostly younger personnel and junior officers. The core design of modern ships goes back to the 1970s, when crews were all-male. [3, 4, 6-8] Assuming the Design Applied Force (DAF) took the average male as the unit of measurement, at 1.0, the crew of the INGSTAD was operating at or below its FAS level. See figure 1, and table 1.

It is no fault of crew members, that the ship was below its *Fight and Survive* Level. That is (more seriously) due to the build, lack of automation, and investment in warship (not submarine) design, going back over five decades. Assuming that the lean-crew DAF was 150, with 15% female crewing the ship was operating at 87% its design level. Indications are that female crewing could have been as high as thirty-three. In which case, the ship was running at 46% its FAS, and 84% its lean Design Applied Force. Existential risk was being taken, even against peace time cruising.

Table 1: Operating Below the Fight and Survive Line

	Crew Size	Design Applied Force (Male)	Theoretical DAF	15% Female Crew	Adjusted DAF	Available Applied Force %	Theoretical Applied Force %
BME Design Crew	275	1.0	275	41	261	95	100
Lean Crew	150	1.0	150	22	142	52	54.5
Actual Crew	137	1.0	137	21	130	47	50

Noting the *Matildas' Digression*, the figures may be softer. Based on availability, for 15% crewing the ship might have been operating at 45% its FAS, and 82% its lean DAF. For thirty-three crew members, this reduces to 43% of its Fight-and-Survive level, and 79% the lean Design Applied Force. FAS analysis suggests, irrespective of female crewing, at best a fifty-fifty probability of surviving even a serious peace time collision. Which is simply not fit for purpose.

Despite being on the FAS line, with all-male crews, only one of the four RN ships lost in action did not sink – HMS SHEFFIELD. A survival rate of 25%. Of the Merchant Ships – the *MV Atlantic Conveyer* survived and sunk under tow; *RFA Sir Tristram* survived and was later repaired and extended and; *RFA Sir Galahad* also survived and was later scuttled by HMS ONYX (S21).

MANAGING WARSHIP RISK

Perhaps not, money for value(s)?

Warships are expected to go into harm's way. If, appropriate risk management had been applied to warship designs, then risk mitigation and a contingency reserve might have been put in place. Particularly, when facing existential threats (in war and peace), and introducing females to sea. As the INGSTAD sinking shows, this may not have been done. Or was glossed over by the zealous application of *lean crewing* – as a cost saving measure.

Appropriate risk management for modern warship designs might have mitigated the risk of the warship sinking, from 43-48% of its FAS, to at least 80%. That would mean appropriately addressing crew constraints. Even that might not be enough. A contingency may require, for example, all male crewing in certain situations, such as war. And, or, providing extra wartime crews – perhaps as many as 55 additional billets (based on the FAS). This would need designing-in, in peacetime – so ships might survive in war. It costs 10 times as much to put in accommodation (or additional capabilities / space) post build, rather than in-build.

Lean (crewing) management consultants, (o) engineers, shipbuilders, naval officers, public servants, HR, politicians, and scientists, all have responsibility for the HELME INGSTAD sinking. It is not the crew's fault, per se. It was, though, a result of applying opportunity and outcomes-based designs and policies. For which there is a cost, that may yet to be paid. A ha'p'eth of tar comes to mind….

This is highly relevant to the RAN, since three current front-line ships are based upon similar core designs. Seven, if the LHD and *Replenishment Oilers* are included.

COMPLEX

Women have a more complex physiology than men. Various studies, (p) have identified that referral rates, particularly for younger women of child bearing age, may be twice as likely (+/-0 .35, at 1 sigma) to consult their GP, than a man. While women between the ages of 16 and 24, may be three times as likely to experience mental health issues than males. (q)

Management consultants tend to assume *like-for-like*, when experience suggests that women are not "simply" interchangeable for males. For example, retention rates. (r) Like-for-like may also have served to satisfy political-fiscal aspirations, on a zero-sum basis. Which, again, may not apply.

Considering the statistics above, a crew comprising 25% females (average age late-20s) may generate up to 40% of sick-bay patients. In terms of mental health, this may be half of all referrals. At 35% female crewing, this increases to 52%, and 62% respectively.

In terms of supporting medical requirements, this suggests increased provision between 25% and 35% (depending on the proportion of female crewing), and for (base port) mental health provision, by 50% and 70%. Such costing has rarely been factored into modelling, or workforce designs necessary to support crews deployed away from home bases, for months at a time.

In impact terms, both availability and productivity may reduce for female crewing. Where Productivity, in Defence terms, may be considered as Preparedness.

The impact on the crew also needs considering. In a serious fire in an RN Type 22 in the 1990s, women found that they were not strong enough to sustain the firefighting effort. They were brushed aside by the men, who took on the firefighting roles – including command and control and re-entry. Automation had failed. In action or a serious accident, that may often be the case. When it will also not be possible to select on gender, from a crew that may, additionally, be suffering from fatalities, shock, and injuries. And where averages – in strength, stamina, availability – will count for more.

In the case of the RN Type 22, men felt let down by the fact that they had borne the brunt – while female sailors were demoralised by being brushed aside. In the HELME INGSTAD, it is possible (despite being below the Fight-and-Survive level – perhaps as low as 43%), that the crew could have done more to save the ship. This may never be known – and might also explain why these questions have not been made public. It takes courage, guts, leadership, conviction, trust, and stamina to save a ship in such a situation. Which may not have been available on the night – exacerbated by *lean crewing*.

(RE) PRODUCTIVITY

The retention rate for males and females can give indication of productivity, over time. For example, if ADF are recruiting for 60,300 personnel (at the present ratio of 80.3% men to 19.7% women), applying the standard retention rate, one needs to recruit about 6800 personnel a year (for all three Services). Given the current proportion of males to females, and the different retention rates, this might mean recruiting 7100 personnel a year. A 4.7% increase in the recruiting, wage, billeting, basing, and training budget – representing about 5700 men and 1400 women, a year. Meaning that to sustain *equal opportunities* (at 60,300 personnel), more recruits are needed. If the aim is to grow the proportion of women serving to 25% on entry (at 60,300), then one may need 5325 men and 1775 women. Meaning the first-year recruiting, billeting, wage, basing, and training budget – across all three services – needs to increase by about $100M per annum.

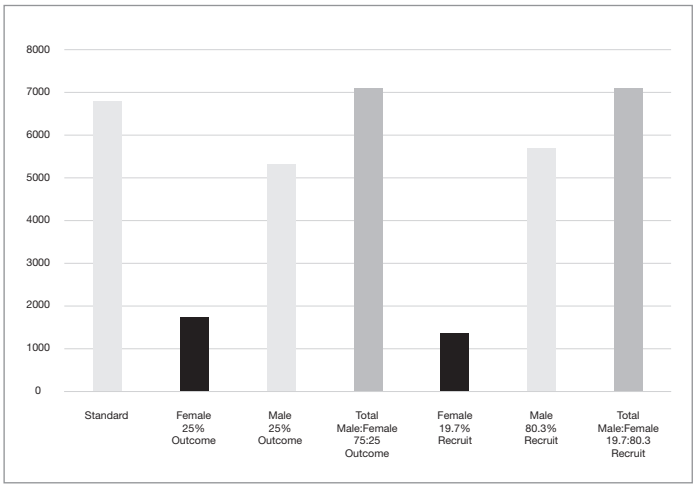


Figure 2: Male and Female Recruiting Requirements

The lower retention rate – and thereby higher recruiting requirement – should not come as a surprise. There are perfectly reasonable explanations, including that 80% of women between the years of 25 and 35 will, more ordinarily, be thinking about finding a partner and starting families. [9, 10] These years are also "peak reproductivity" – if birth rates and societies are to be maintained. Because ADF employment may also be existentially demanding – it should not come as a surprise, that retention and recruitment may be lower for females. Or that males do not also want to support their partners in starting and raising families. Which might not be possible, at / from sea.

It may be that the current 4:1 ratio of men to women across all three Services is the norm for Australia's population. Suggesting increases may be unsustainable? For example, in 2018 it was reported that Navy was seeking to increase female participation to 25% of its workforce (set at 35% in 2020), by 2023. This led, amongst other things, to some all-female entries. [5] Reportedly, Navy achieved 23% female participation on 30 June 2021. (s)

Prima facie, successful female recruitment – and retention – is based on male participation, and productivity. People are not "one-for-one." Rather than cutting, or stopping male entries, Navy might have increased its overall intake by 6% and recruited proportionally more females. Thereby not, potentially, sending the wrong message to all our communities – particularly now, post COVID, when recruiting has seemingly collapsed in western nations.

OPPORTUNITY VERSUS OUTCOMES

Taking the boys from the toys.

The above examples, were based upon ensuring equal opportunities for women, on entry – by sustaining the current ADF population recruitment base; while recognising different priorities and retention rates. Which are not the same for men and women.

The recent push for "same pay, same job" IR legislation is an example of outcomes verse opportunities-based employment. Other legislation – non-transferable parental leave (between fathers and mothers) – appears aimed at making men and women equally productive. By making men, less so. Potentially also removing selection (based on merit, fitness, choice, and competition) from the market place. All cornerstones of productivity and preparedness. Outcomes-based policies may also be a hallmark of *Fifth Wave Feminism*, and the idealistic, CIT, move from equal opportunities to identity-based outcomes.

The imposition of outcomes-based values has specific implications for the ADF. If there are to be equal outcomes over a full career (of 35 years) recruitment requirements increase again. If the ratio of men

to women is to be retained at 4 to 1 (80.3:19.7) over 35 years, then one may need 7185 recruits a year, a 5.7% increase – representing 5475 males and 1710 females, at 3.2 males recruited for every female.

If the outcome requires growing to / sustaining at 75:25 (3:1), then 5025 male and 2160 female recruits may be required annually (at 2.3 males to every female recruited). The cost for first-year recruiting, billeting, wage, and training budget, may be an additional $120M a year.

NOT ZERO SUM

Providing equal opportunities in Defence (and many workplaces) was unlikely to be zero-sum. There are both initial and long-term costs to sustain increased female participation in the Defence workplace. There are initial costs for recruiting proportionally more women, than required by the male retention rate. Putting upward pressure on an already constrained – and potentially reducing – employment market.

Table 2: Recruiting Opportunity and Outcomes costs

Opportunity Recruiting / Population	"As Is" (%)	75:25 (%)	Min Male "As Is" (%)	Min Male 75:25 (%)
Male % (to sustain current Defence Population, 60,300)	80.3	75	80.3	75
Female % (to sustain current Defence Population, 60,300)	19.7	25	19.7	25
Total	7100	7100	7100	7600
Increase Recruiting %	4	4	4	11.7
Increased Defence Population %	Nil	Nil	Nil	7.1
Males after 35 Yrs %	84	79	84	79.25
Females after 35 Yrs %	16	21	16	20.75
Outcome Recruiting / Population	**"As Is" (%)**	**75:25 (%)**	**Min Male "As Is" (%)**	**Min Male 75:25 (%)**
Male %	76.2	70	76.9	72.5
Female %	23.8	30	23.1	27.5
Total	7185	7185	7410	7860
Increase Recruiting %	5.6	5.6	8.97	15.5
Increased Defence Population %	Nil	Nil	3.5	10.2
Males after 35 Yrs %	80.3	75	80.9	77
Females after 35 Yrs %	19.7	25	19.1	23

Modelling indicates, that increasing female participation on recruitment or overall (as an outcome) has come at the cost of male participation, see table 2. If the focus is on equal recruiting opportunities as currently constituted (80.3:19.7), then there would still need to be an increase in recruiting targets by 4% to allow for 'natural' differences in retention rates. If the aim is to increase the proportion of women to men serving to 25:75 (at 60,300 personnel), then there would be a 5% reduction in male recruiting within the increased recruiting numbers, see table 2. Neither different retention rates, nor increased recruiting targets may have been adequately factored into Defence policy.

If the focus is on equal outcomes as a proportion of those serving (80.3%: 19.7%, growing to 75:25), recruiting needs to increase by 5.6% with male recruiting reducing by between 4% and 7%. Risk is being taken against the male population by increasing opportunities for women and reducing those for men. Which may send entirely the wrong messages and be unsustainable over the longer term.

If a minimum number of male recruits was set, as necessary to sustain the current 80.3% male:19.7% female Defence population, then opportunities might be maintained; while appropriately managing recruiting risk. This would still require increasing recruiting by 4%. If the intention is to grow recruiting opportunities to 3 males for every 1 female, then there would need to be an increase in recruiting by 11.7% and the Defence population (over 35 years), by 7%. Thereby mitigating risk in both the short and longer terms.

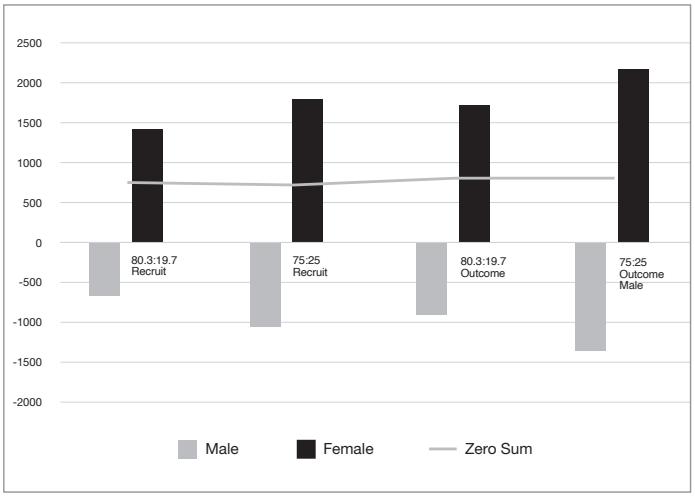


Figure 3: Not a Zero Sum

If the focus remains on equal outcomes, while sustaining minimum male entries, recruiting would need to increase by between 9% and 15.5%, accepting the Defence population increases over 35 years.

In actuarial actuality, there is no zero sum – all changes (opportunities or outcomes) require increased recruiting between 4% to 15.5%. By setting minimum male requirements (mitigating risk over the longer term), outcomes-based recruiting, increases the Defence population by between 3.5% and 10%, over 35 years.

Unequal Outcome Opportunity Costs?

Equality is based equably on successful male participation. Potentially more so in conflict or crisis.

"Equality" suggests that, far from reducing male participation to increase female recruiting, male recruiting might be fixed at a minimum and female recruiting adjusted accordingly. Such analysis may be antithetical to decisions regarding all-female entries. Males lost to Defence on entry, cannot be replaced downstream…

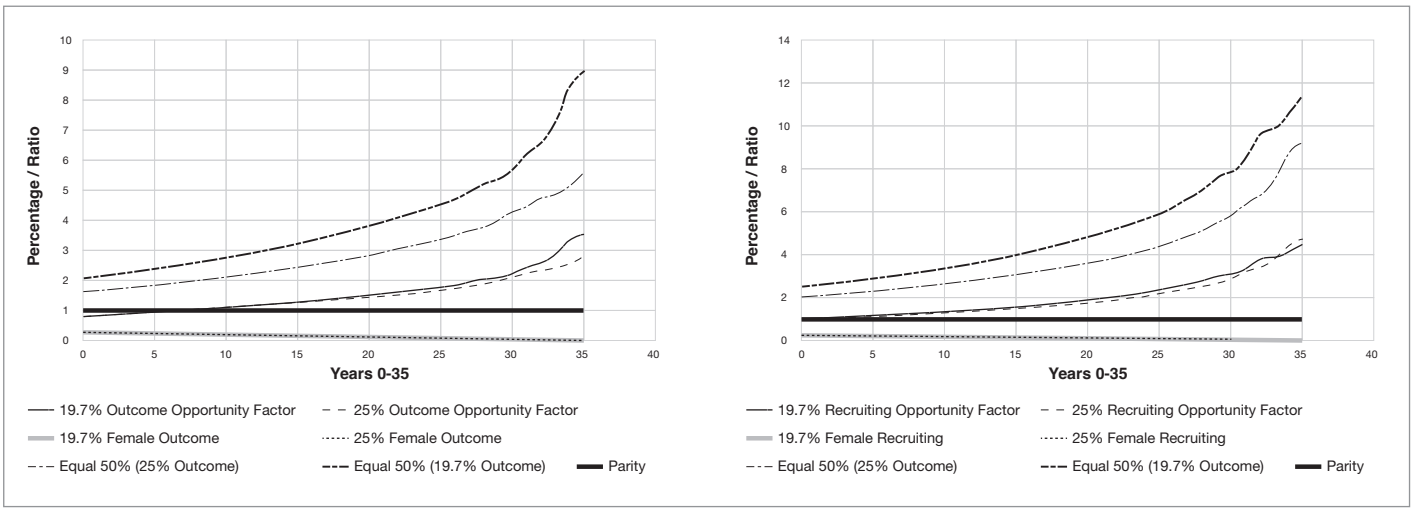


Figure 4: Affirmative Selection as a Proportion and 50%

Costs of labour supply and demand are one of many factors – there are also longer-term costs as to automation and warship design to enable women to be interchangeable with men. Whereas in peace time, this may be politically feasible – if expensive – it may not be affordable, or possible in war. Moreover, it might not be feasible to make existing warships "safer" without a fundamental re-design, and rebuild of existing fleets. This may be no bad thing. Irrespective of automation, current warship designs (unlike submarines) may be well below the design FAS. No amount of mitigation or contingency may put this right. [11]

There is perhaps a more pernicious opportunity and political cost that needs thinking through – which is addressed, in part, by Hakim (2006) and Wolf (2013).

Hakim considers up to 80% of a western female population will choose to have children. Comprising 10-30% (20%), she calls *home centred* women, and those women (Hakim calls *adaptive*) with children and a career (40-80% (60%). The remaining 20% (10-30%) – who choose a career and not to have children – Hakim calls *work centred*. [9]

Table 3: Affirmative Discrimination?

	Years 5 to 15	Years 16 to 25	Years 26 to 35
Recruiting Opportunity Factor	1.3 to 1.4	1.85 to 1.96	3.2 to 3.7
Affirmative (50%) Recruiting Factor	2.7 to 3.5	3.7 to 5	6.5 to 8.5
Outcome Opportunity Factor	1.1	1.5	2.2 to 2.5
Affirmative (50%) Outcome Factor	2.2 to 2.8	3 to 4	4.4 to 6.4

If this is the norm, then the ADF may be appealing to 80% of the female workforce, and about 62.5% of the eighty percent of women available to work. In practice, the opportunity and volunteer base could be as little as half that for males. Consideration, therefore, for a normal upper limit of between 1 in 4, and 1 in 3 women to men, might not be far wrong. It may also suggest that men may be more than twice as likely to seek employment in the ADF as women.

Table 3 and figure 4 give some indication of what might be occurring. In years 5 to 15, the *affirmation factor* based upon opportunity and outcomes recruiting is between 1.1 and 1.4 times the population base. With women 10% more likely to be promoted / gain a preferred appointment than males (based on the proportion of women serving), this is probably manageable and 'comparable'. At 40% more likely, this begins to break down – since selections may no longer be based 'objectively' upon merit. If outcomes-based *Affirmative Action* is applied (for half the selection pool to be women) then the factor is between 2.2 and 3.5 times that for men. This may no longer be tenable, or fair to men seeking to advance themselves based upon qualification, and experience. In application terms, it means women will often be selected earlier – and men later in career. Thereby also reducing promotion opportunities based upon fixed age windows.

If one considers years 16 to 25, critical for senior level promotions and the generation of expertise, the *opportunity factor* – based upon opportunity and outcomes recruiting – is between 1.5 and 2 times the population base. With an *affirmative factor* between 3 and 5 times that for men. It should be recalled, that not only is this "outcome" penalising men, but also adaptive women and their families relying on the advancement of their partners. The major beneficiaries being *work centred women*, who choose not to have children.

Alison Wolf (2013) concludes what she sees as *elite women* – often without children; coming to the fore from mid-career (16 years plus):

> *…like elite men, [elite women] tend to love their jobs: they are part of their identities. Elite women, in contrast, lead lives that are increasingly like those of the men beside them.* [12]

In later years, years 26-35, when one is selecting for board level appointments – Warrant Officers and Captain (Colonel) / Flag ranks – the female population base may become too small (and unstable?), for reliable selection. The *opportunity factor* – based upon opportunity and outcomes recruiting – is between 2.2 and 3.7 times the population base, with an *affirmation factor* between 4 and 8.5 times that for men. At these levels of affirmation bias, there is no level playing field – and the majority (of women (80%), men, and families) may suffer.

NOT GOOD FOR GOOSE; NOR GANDER?

> *Over a career, considering there to be no differences between choices, aspirations, and outcomes, helps neither women; nor men.*

Setting aside physiological differences discussed earlier, it could be argued that biases are accentuated by front-end recruitment, with limited sideways entry. As exist in most Defence forces. If male

and female populations were identical – with a similar number of geniuses and duffers; risk takers and risk averters – affirmative biasing may not matter. (t) In practice, female populations may tend to be more normative than male – potentially fewer risk takers and risk averters; geniuses and duffers. Which means that, not only may one be promoting and selecting from a smaller pool (than for men) but also, perhaps, a more normative one. Possibly more risk averse and less likely to be on the edge of the discipline (in this case, "on war") – where innovation and invention necessarily occur.

Hakim [9] recognises from her analysis, that there may be four males for every one female at the elite level of selection – with an *affirmative factor* of 2.5. Such a factor may be reached as early as years 5 to 16, in the ADF, when applying outcomes-based recruiting and actuarial retention rate differences between men and women.

> "Approximately 17.6 per cent of BHP staff were female in October 2016 when the company adopted its 2025 gender balance target. Female participation in the BHP workforce has since risen rapidly, to reach 32.3 per cent at June 30 2022". (u)

According to Janet Albrechsten, "on average women [in BHP] are appointed to their first managerial roles at 42, while men had to wait until they were, on average, fifty-one. Fair? Only if male employees are so lacking in experience as to warrant this difference." (v)

BHP were forced to settle out of court with a complainant in a suit brought in the U.S., to avoid Common Law precedence being set. Which might then apply to all Common Law jurisdictions. (w)

Women provide a fundamental and vital contribution to the ADF. A subsequent paper will examine alternative designs and recruiting strategies that may be good for Defence, and all its men and women - because they're worth it! ■

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Notes

a) Fifth wave feminism channels all the power of prior feminist (waves) to create a multi-dimensional movement focussed on equal outcomes. One that recognises feminism belongs to all — regardless of colour, age, religion, nationality, identity, gender. Incorporating transgenderism, fifth wave (western) feminism claims that it is built by "women" everywhere – "when it belongs to us all, we will stop winning battles and focus on ending all wars, and the war on women worldwide."

b) The second wave characterised at the time as Women's Liberation, addressed issues of equal opportunity and pay, rape, and domestic violence, and workplace safety, to promote women in popular culture and more positive and realistic roles. Including in popular culture, spread through feminist films, music, books, and restaurants.

c) The third wave, saw the emergence of new feminist currents and theories, such as intersectionality (layers of oppression, caused, by gender, identity, sex, race, and class), critical race (and identity) theory, sex positive feminism (reproductive rights), ecofeminism, global warming (climate change), catastrophism, transfeminism, and postmodern feminism.

d) See Russian Fatalities in Ukraine War, www.npr.org/2023/07/14/1187847548/how-many-russians-have-died-in-ukraine-new-data-estimates-soldier-casualties, accessed July 2023 – as confirmed by US Department of Defence Estimations.

e) See Women on the Frontline, https:/visitukraine.today/blog/1808/women-on-the-frontline-how-many-ukrainian-women-are-taking-part-in-the-war-and-what-you-need-to-know-about-their-exploits, accessed July 2023.

f) See Women on the Frontline, ibid.

g) HMS ANTELOPE was evacuated before the bomb exploded, and other, generally older, warships survived despite being hit.

h) At a ratio of one fatality to two injuries (1:2), this is much higher than WW1 and WW2 ratios of 1 to 4, or in Iraq and Afghanistan – when it was between 1:30 and 1:50.

i) See Vindolanda, vindolanda.csad.ox.ac.uk, accessed July 2023

j) See Force of the Future, Frustrated, www.asisonline.org/security-management-magazine/articles/2020/09/force-of-the-future-frustrated/, accessed July 23.

k) See Laine, M (2020) How much stronger is an average man than an average woman? Quora, Jan, www.quora.com and Wood, L (2020) Are AFLW knee injuries linked to menstrual cycles? The Australian, 18 Feb 2020, https://www.theaustralian.com.au/sport/afl/are-aflw-knee-injuries-linked-tomenstrual-cycles/news-story/19a6bb1da550c6e8902c6be383e0ca43.

l) See, Journal of Exercise Physiology (2016), www.asep.org/asep/asep/JEPonlineOCTOBER2016_Monteiro_Bigio.pdf , accessed Aug 2023

m) See Strength in Women Compared to Men, www.livestrong.com/article/509536-muscular-strength-in-women-compared-to-men/, accessed Aug 2023

n) See Norwegian warship accident raises questions on women in armed forces, www.theweek.in/news/world/2018/11/20/norwegian-warship-accident-raises-questions-on-women-in-armed-fo.html, accessed Aug 2023.

o) Lean is a version of the notorious Performance Management regimes that have done so much harm since the 1980s.

p) See, for example, Wang Y, Hunt K, Nazareth I, et al (2013). 'Do men consult less than women? An analysis of routinely collected UK general practice data.' BMJ Open 2013;3:e003320. doi:10.1136/bmjopen-2013-003320, and Injury rates in female and male military personnel: a systematic review and meta-analysis - PMC (nih.gov) , accessed August 2023.

q) See Mental Health Foundation, www.mentalhealth.org.uk/explore-mental-health/statistics/men-women-statistics, accessed August 2023.

r) See Force of the Future, Frustrated, ibid.

s) Women currently serving in ADF, Mates4Mates, https//:mates4mates.org/news/women-within-the-adf, accessed August 2023.

t) See Allison Schrager, A (2015) *Men are both dumber and smarter than women*, Quartz, July 9, https://qz.com/441905/men-are-both-dumber-and-smarter-than-women/, accessed Aug 23.

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w) See LAW 360, Powers v. Broken Hill Proprietary (USA), Inc., *BHP Unit Ends Sex Bias Suit Over Gender-Parity Gap*, March 06, 2023, www.law360.com/cases/6081b279c6e84c028c17840c, accessed Aug 23.

A 'READY RESERVE' FOR THE RAN

By Dr Neil Baird and Robert Blake

Recent revelations that China has launched multiple new Ro-Pax ferries that could be used as amphibious assault ships against Taiwan have caused consternation among some strategic analysts. The core of this article appeared in Article for ASPI/The Australian Defence supplement, May 2023.

ADV Reliant wearing the Australian White Ensign.

A ROAD TRIP ASIDE

The first author recently returned from an 8,500km trip along the east coast as far as Thursday Island, raising two observations / objections:-

1. In NSW and Queensland alone, there are thousands of commercial and private vessels that could be very usefully requisitioned by Navy if necessary.
2. Another odd Christopher Pyne acquisition is *ADV Reliant* was noted embarrassingly in action in Cairns. Despite paying five times its market value for this ship, it is incapable of getting out of its own way when operated by Navy personnel. Even though, with its twin *Aquamaster* AZDs and three side thrusters, it could be parked sideways by a 10-year-old, it required tug assistance to berth on a calm day in Cairns.

One could go on, for example, about the literally thousands of Army vehicles we saw on the Bruce Highway returning from the big exercise (Talisman Sabre). Many were large MAN trucks. The first author later asked a young Army lieutenant he met on Thursday Island about that enormous fleet. He said:

"Yes, we have plenty of vehicles but most of them are too heavy and bulky to be any use".

Such is Canberra!

PEOPLE'S LIBERATION ARMY MARITIME MILITIA (PLAMM)

Chinese Ro-Pax ferries are nothing new. Their fleet of them has been gradually building for forty years. They are now, naturally, much better ships than they were in the 1980s. More importantly, they have openly become vital components of the Chinese PLA Navy's fast-growing Maritime Militia. As, indeed, were Western Ro-Ro ferries as part of NATO's response to the Soviet threat during the Cold War. When many Ro-Ros were fitted for wartime roles – including mine laying. At a time when the West was thinking and had not forgot itself.

The *People's Liberation Army Maritime Militia* is what really should be frightening Western naval planners. Its size is difficult to gauge and its effectiveness, preparedness, and readiness, impossible to measure. However, rough estimates are that it comprises well over 100,000 vessels and many more than a million personnel.

Think about it a moment. That is one-hundred thousand vessels, each crewed by, on average, ten personnel. At a crew of 10, this marries much more closely to Merchant Navy crewing – typically of about 10-15 officers and sailors. Even for the largest of ISO Container Ships.

Additionally, these "double badged" personnel, Merchant Navy and PLAMM, are, very largely, the people who operate those vessels on a day-to-day basis. They are, thus, mostly very familiar with and generally skilled operators and sailors of those vessels.

In effect, the PLAMM comprises a significant proportion of China's already large and fast-growing fleet of government and commercial vessels. They include fishing boats, ferries, police and other non-naval patrol boats, rescue boats, pilot boats, cargo ships, tugs, barges, ferries, tourist boats and many others including the important, above-mentioned, Ro-Pax ferries. Many based originally on advanced Western designs, modified for PLAMM purposes.

RESPONSE?

Australia, though, is in a good position to learn from and respond to China's Maritime Militia. Ideally, it should rapidly establish a Red or Blue Flagged 'Ready Reserve' of available vessels and personnel. Where the Red Flag, or ensign, refers to Merchant Navy vessels, and the Blue Ensign to auxiliary ships, crewed and run on behalf of the Commonwealth. As per the UK *Royal Fleet Auxiliary*, or British Army vessels For which an Australian Blue Ensign was proposed by the NLA / The NAY – to be worn, for example, on ADV's such as *ADV Reliant*, rather than the Australian White Ensign. Which it is totally inappropriate for this ship to be wearing.

People's Liberation Army Maritime Militia (PLAMM) Vessels – exerting maritime grey war.

PLAMM Xianglong Dao - Large luxury Ro-Pax (alternative troop vessel) to operate in China's home waters (image Baird Maritime).

Australian Designed Type 22 PLAN Missile Boats.

Note 1. The displacement of HMAS with ADV is a concerning indication of the creeping, somewhat underhand republicanisation of institutions, such as the Royal Australian Navy. Seemingly gathering pace under this government.

Australia boasts a fishing fleet of around 2,500 capable boats ranging from small fast abalone diving vessels, through impressive fast lobster boats, to long liners and powerful trawlers. We have a similar number of government and commercial work and patrol boats. Tugs, barges, patrol, pilot and rescue boats and many others. We even have some modern Ro-Ro and Ro-Pax ships that are comparable with China's. Unlike China, however, Australia also has a considerable fleet of substantial, fast, and capable leisure boats that could readily be converted to naval or support roles.

WHAT ABOUT COASTAL CARGO VESSELS?

Such inventory would be quick and easy to record. There are only a dozen of them! However, an obvious, quick and cheap solution to the coastal cargo conundrum would be the use of tugs and barges. We have some but not enough in the event of a major war. Barges, apart from carrying cargo, could make strong and quickly constructed and moved missile-launching platforms.

RESERVE OF PERSONNEL

Australia possesses a considerable 'reserve' of personnel who are familiar with and competent to operate such craft. They do, after all, use their vessels frequently, more so, obviously, than the Navy could ever do with its own fleet. Their availability and skills should also be recorded.

Unfortunately, unnecessarily and unjustifiably, too many senior regular RAN officers seem to take a dim view of reservists. This attitude should be corrected. Reservists have proved useful in the past and will do so again. They only require modest amounts of training in naval doctrine, communications, procedures, and habits – the Navy way – to fit in. Mostly they are far superior and more experienced ship and boat handlers than most naval officers. A revival of the RANR and RANVR as a 'Ready Reserve,' could be established rapidly and economically.

Further, it would obviously be particularly sensible if Defence or the RAN, would compile a detailed and accurate inventory of Australia's world leading naval architects, shipbuilders and repairers. It is almost certain that the government has no such inventory and, even if it did, it is even less likely to be accurate or up-to-date.

Public servants are not good at compiling such lists. Particularly when, as now is becoming evident, so many public servant positions are filled by consultants (34,000 of Defence's 50,000 public servant positions) – often reporting through and to their respective accountancy consultancy companies. As dominated by PWC, Deloitte, KPMG, and EY – all with questions hanging over them regarding trust. The trust necessary to exchange such vital information between otherwise competing commercial concerns – in the interests of Commonwealth. And, for which, a professional apolitical and public (not privatised) service is a pre-requisite.

Note 2: Perhaps, learning from previous wars, a way of managing the privatisation crisis in the ADF (and other key ministries) would be to make all public servants Reservists – some in uniform and attached to the ADF. So also placing personnel under Commonwealth-ADF (or the King's) Regulations. Where command, control, discipline, and the loyal reporting of contracted public servants might be better managed?

LEARNING FROM THE PAST

During World War II some 160 new merchant and naval vessels and 36,000 smaller vessels and ancillary craft of 160 types were built in Australia.

Some were built by established yards such as Halvorsens, Norman Wrights and Bowdens in Sydney and Brisbane but others drew on the production line skills of companies like Ford Motor Company, General Motors Holden, Slazenger (tennis racquet manufacturers) and Concrete Constructions. An inventory of the modern equivalents of those companies would also be very useful.

PROPELLING CHANGE

A very significant problem facing local construction of all vessels is a supply of engines and propulsion systems. We manufacture propellers and shafts and some water jets here but not much else. No diesel engines. No outboard motors, no AZDs. We should be organising to build Cummins, MTU, MAN and Yanmar diesel engines here under license.

It would be wise to purchase a substantial quantity (at least 2,000 units) of 300 horsepower diesel outboard motors. In single and multiple installations, they could serve a multitude of purposes on workboats, landing craft, patrol, assault and rescue boats and much more. They provide the ultimate in durability, flexibility and replace-ability.

THREE FLAGS MODEL

Fifteen years ago, proposals for crewing Commonwealth Navies were submitted by ANSON *et al*, based upon the *Three Flags Model*. [1] This model considered the three ensigns of Commonwealth navies – the White Ensign of its navies, with the Red Ensign of the Merchant marine, and the Blue Ensign of its auxiliary fleets.

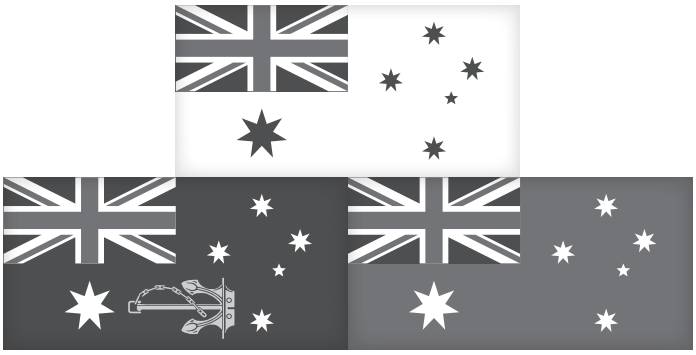
The model works today as it did yesterday by enabling the healthy flow of crews and platforms between grey-funnel ships (the White Ensign), with Red and Blue Flagged vessels. It is underpinned by the application of modern commercial platforms and their crews in their military and auxiliary capacities – and *vice versa*.

The versatile modular systems (VMS) approach creates capital,

engineering, infotechnological and crewing flows between the fleets. So, rescaling the fleets in terms of size and numbers. It provides attractive employment opportunities to sustain crews and fleets over their lifecycles – with ships being sold on (with their integrated modularised weapons fits, as required) – at the half-design life, or 15-years. When there is still some life in the ship.

The model is also a *pacification bridge* – whence these second-hand vessels are affordable and applicable, interchangeable, with our allies in the Pacific region. More so than highly dependent, non-interchangeable (Merchant of Allied navy) PLAN hand-me-downs.

This type of inventive and innovative thinking is what we would be doing if we were at war. Begging the question as to "why we are not doing it today, in preparation and support of deterring war in our region?" The answers, sadly evident from this analysis.



Three Flags Model Incorporating NLA - *The NAVY* designed Blue Ensign.

THINKING WITH A WARTIME MENTALITY

Much of what is being proposed is on the record. [1-51]

There is much that can and ought to be done quickly and relatively cheaply to improve our naval defence readiness. The problem, as always, is developing or inspiring the political will and the imaginative, adaptable naval leadership to make the necessary practical decisions no matter how distasteful they may be.

To be better prepared for war, Australia must ensure that Canberra's blinkers be removed. Its defence, particularly its maritime defence can be achieved by rejecting or reforming much of its wasteful and tediously slow conventional 'wisdom'. ■

MAERSK has previously submitted ISO Container Ships converted to Aircraft Carriers (Air Transport Capabable Verstaile Modular Ships).

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UK, NETHERLANDS PLANNING ON AMPHIBIOUS SHIP REPLACEMENTS

The UK and the Netherlands are planning to commence designing their replacement amphibious ship programmes at the start of 2024. This follows successful previous cooperative build programs – such as for the *Bay-class*, operated by the Royal Fleet Auxiliary and the RAN.

The plan is to replace existing vessels in the Royal Navy (RN) and the Royal Netherlands Navy (RNLN) from the early 2030s. Both navies have been developing requirements for new amphibious/littoral support shipping. The RN has stated a requirement for up to six Multi Role Support Ships (MRSSs) to replace the two *Albion-class* landing platform dock (LPD) vessels, three *Bay-class* landing ship dock (auxiliary) vessels, and the primary casualty receiving ship RFA *Argus*.

At the same time, the RNLN's LPX programme is looking at a multirole capability that would replace the LPDs HNLMS ROTTERDAM and HNLMS JOHAN DE WITT in the amphibious role while also assuming the patrol and surveillance tasks currently performed by the navy's four *Holland-class* patrol vessels.

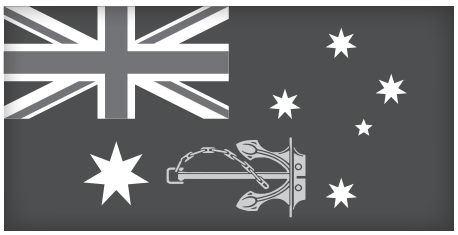
The Australian Army Littoral Manoeuvre Force and the need to replace HMAS CHOULES (L100) in a similar timeframe, would suggest that the ADF might also consider joining the program at an early stage. The order, while not as large as the RN, might include three landing ship dock (auxiliary) vessels – two to be operated by Army, and one to replace CHOULES. The crewing requirements for these more modular ships mean that the Army vessels could have a complement as little as 20 for peace time cruising. Distinguishing also between Navy and Army crewed vessels – where HMAS CHOULES has a complement of One Hundred and Fifty sailors. This is also one of the strong arguments for creating a Royal Australian Fleet Auxiliary (RAFA, see paper 2), which would also have the impact of strengthening the Australian Merchant marine.

REPLACEMENT LHDS

Australia also needs to commence designing for the replacement of the LHDs HMAS CANBERRA and ADELAIDE – neither of which have been utilised to their full effect. Notably in the way that they have been *strategically vandalised* to prevent the operation of F-35B, and left under-armed – for their potential wartime roles. In this respect, their replacements may better be an Amphibious Force of LPDs and LSD (like CHOULES), than potentially Landing Helicopter Docks. It may make sense for Army and Navy to align their future programs with the RN and RNLN, at the soonest opportunity.

ENSIGN FOR ARMY

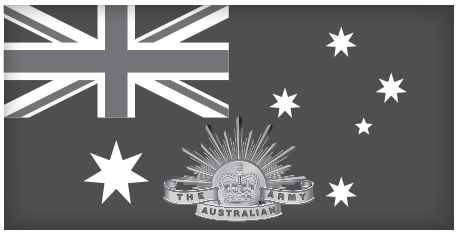
Unlike the British Army, the Australian Army does not yet have its own ensign to fly on Australian Army Vessels (AAV). To act in a way similar to the Colours of a regiment. But also, with legal and maritime implications – signifying a man of war and, or, a government operated vessel.



NLA Proposed Blue Ensign for wearing on Australian Defence (or RAFA) Vessels, such as ADV *Reliant*.

Just as the NLA has proposed a Blue Ensign to be flown on Australian Defence Vessels, a Blue Ensign derivative – as per His Majesty's [British] Army Vessel's maritime ensign – might fly on Australian Army Vessels.

The proposed design is similar to the Chief of Army Flag, without the crossed swords, and incorporates the rising sun emblem of the Australian Army, with the Royal crown.



NLA Proposed Blue Ensign for wearing on Australian Army Vessels.

Prior to the disastrous Defence Strategic Review, Army was planning on building a littoral manoeuvre force of 60 significant vessels, including major amphibious ships. [1] Although delayed, the emphasis shape, and form for this significant force will create a littoral maritime force in size not dissimilar to the RAN. This places even more emphasis on distinguishing between RAN White Ensign vessels, AD and RAFA vessels, and Australian Army Vessels.

AUSTAL USA TO BUILD THREE LCU 1700 CLASS LANDING CRAFT

Austal USA was awarded a $140M fixed-price incentive and firm-fixed-price type modification to refine a previously awarded contract for the detail design and construction of three *Landing Craft Utility* (LCU) 1700 class craft. The contract also includes options for nine additional craft and associated support efforts.

Swiftships Image of AUSTAL LCU

The 45 metre LCU 1700 class would provide an ideal match for the Australian Army, for which a class of up to nine such vessels were previously being considered. Dave Growden, vice president of AUSTAL new construction projects stated:

> Austal USA is honoured to be able to build this important connector for the U.S. Navy. We recognize the critical role this platform plays in supporting expeditionary operations for the Navy and Marine Corps and are looking forward to continuing to deliver ships and boats to our customers on time and on budget.

LCU can operate independently and can be carried aboard amphibious assault ships to the objective area (STOM) and used across a range of military operations to deliver vehicles, personnel, and cargo from sea-to-shore and back. These connectors provide a heavy-lift capability and can carry about the same payload capacity as seven C-17 aircraft.

These versatile vessels are in high demand in littoral and island seas – such as exist in the western Pacific. As such they have a high re-use and commercial re-sale value. Making commercial operation of these Fleets through applying the capitalised Versatile Modular Fleet (VMF) model, particularly attractive. [2]

JMSDF ENHANCES LITTORAL MANOEUVRE CAPABILITY

The Japan Self-Defense Force (JSDF) has taken another step towards improving its army-navy interoperability with the completion of flight trials of an MV-22B *Osprey* tiltrotor aircraft on its *Hyuga-class* helicopter carrier, JS ISE (DDH 182)

These trials were completed during an operation in the area of the Izu Islands, the Japan Maritime Self-Defense Force (JMSDF) disclosed in a statement to mark the occasion.

The MV-22B aircraft is operated by the Japan Ground Self-Defense Force (JGSDF) – Army – while the ISE is the second of the JMSDF's *Hyuga-class* helicopter carrier. The tiltrotor aircraft that the JGSDF operates is a Osprey Block C variant, which features improved avionics and navigation systems – fitted in / by Japan.

Japan became the first country outside the US to operate the MV-22B when the airframe was received by the JGSDF in 2020. The ISE had previously carried out landings of similar aircraft operated by the US Marine Corps.

JAPAN MARINE UNITS

In 2018, Japan activated its first marine units since World War Two trained to counter invaders occupying Japanese islands along the edge of the East China Sea that Tokyo fears are vulnerable to attack by China.

The formation of the Japanese marine brigade within the JGDSF was controversial because amphibious units can project military force and could, critics warn, be used to threaten Japan's neighbours. In its post-World War Two constitution Japan renounced the right to wage war.

The brigade is the latest component of a growing marine force that includes helicopter carriers, amphibious ships, Osprey tilt-rotor troop carriers and amphibious assault vehicles, meant to deter China as it pushes for easier access to the Western Pacific.

The activation of the 2,100 strong Amphibious Rapid Deployment Brigade (ARDB) takes Japan a step closer to creating a force similar to a U.S. Marine Expeditionary Unit (MEU) able to plan and execute operations at sea far from its home base.

Japanese military planners have augmented their maritime amphibious capability through the deployment of F-35Bs to operate from its *Izumo* and *Ise* class helicopter carriers, or from islands along the East China Sea.

The JGSDF is also seeking to acquire small amphibious ships up to 100 meters (328.08 ft) long to transport troops and equipment between islands and from ship to shore. The strategic intent is to bring forces and gear on large ships to the main Okinawa Island and then disperse them to other islands on smaller vessels. These vessels may also be suitable for Army Littoral Manoeuvre Force and Navy?

JMSDF LARGE FRIGATE DESIGN

Japan has down-selected a large frigate design for its follow-on program to the country's *Mogami-class* frigate.

Designs for the larger warship were submitted by Mitsubishi Heavy Industries (MHI), which has been selected as the main contractor for the program. Its class name has not yet been announced – and it may be considered as a *Mogami-class* Batch 2?

The report notes that MHI was awarded a 15.4-million-yen ($170 million) contract while Japan Marine United Corporation (JMUC) won a 14.96-million-yen contract to conduct studies on the future frigate, with August 2023 given as the deadline for proposed designs.

The Japan Maritime Self-Defence Force (JMSDF) originally planned to buy 22 *Mogami-class* frigates, with a production rate of two ships per year.

The *Mogami-class* is built to improve the JMSDF's capability to patrol its extensive Exclusive Economic Zone (EEZ), strengthen its deterrent posture and respond to various situations, as well as provide multi-mission capabilities. The report noted that the *Mogami-class* is set to replace the JMSDF's aging *Asagiri-class* and *Abukuma-class* destroyers.

The *Japan Times* noted (March 2023) that the *Mogami-class* is difficult to detect by radar due to its stealth hull shaping and can perform various missions such as warning and surveillance, anti-air, anti-surface, anti-submarine and minesweeping operations. The report also mentions that it was designed to be cheaper to build than large destroyers while having less than half the manpower required to operate.

The company's proposal was selected following a multistage evaluation process, according to a release by the Japanese Acquisition, Technology & Logistics Agency (ATLA).

The new warship class will feature a heavier standard displacement of about 4,880 tonnes, a greater overall length of about 142 m, and a wider overall beam of about 17 m, according to details released by ATLA in August.

MSC CHARTERS THREE TANKERS FOR SEALIFT

The US Navy's Military Sealift Command (MSC) has chartered three US-flagged OPA90 compliant tankers for a 90-day period, for operations in the Middle and Far East:

- *MV Stena Bulk*
- *MV Stena Imperative;*
- *MV Torm Timothy*

The charter is expected to be completed by January 2024 – however ageing sea-lift command vessels, and slow replacement rates means that Military Sealift Command is likely to extend operations well into 2024.

Pressure is mounting on replacing ageing support and logistic ships across allied fleets. At the same time, the charter rate continues to weaken, having collapsed in 2022 – meaning there is spare capacity in the market. With inflation bighting, most western governments are also seeking to cut back on military expenditure – creating a perfect storm. Whereby the demand signal for replacement auxiliary fleets is increasing, just as budgets are being cut as costs reduce and capacity increases.

Capitalisation of western navies remains critical; fundamentally underpinning the model derived by ANSON for enabling the modularisation of commercial hulls for application in military and auxiliary navies. Given the scale of the current inflationary crisis – with no additional capital likely to be available to Defence Forces – the ANSON model may be the only viable way to reinvigorate moribund shipbuilding, and urgently upscale navy, auxiliary, and merchant fleets. Applying equally to the building of Army's Littoral Manoeuvre Fleet[3]

USS RAFAEL PERALTA HAS FIRST US MISSILE LOAD AT EDEN, AUSTRALIA

USS RAFAEL PERALTA (DDG 115) Ammunitioning at Navy Armament Depot, Eden.

USS Rafael Peralta (DDG 115) completed the first-ever live ordnance reload for a U.S. warship in Eden, Australia, when it rearmed its Vertical Launch System (VLS) in August.

The ammunitioning took place following exercise *Talisman Sabre 23*, where RAFAEL PERALTA had conducted a live-fire exercise with the Standard Missile (SM) 2.

Commander Charles Cooper USN, CO USS RAFAEL PERALTA, commented:

> There is tremendous value in expanding the range of locations throughout the Indo-Pacific where U.S. Navy ships can rearm missiles while deployed," said. "Increasing our options for reload sites provides increased flexibility across our mission sets and operating areas. Working closely with our Australian allies, we were able to successfully demonstrate this capability at Eden.

RAFAEL PERALTA participated in exercise *Talisman Sabre 23* starting in late July, continuing through a scheduled port visit to Sydney and then operating in support of exercise *Malabar 2023*.

U.S. Navy logistics specialists coordinated with RAN ammunition experts for the transportation of ordnance to Eden to coincide with the ship's arrival. Cooper noted:

> We've worked hand-in-hand with the Australians through multiple exercises and engagements over the past month. It is inspiring to see how our teams have improved interoperability and operated as a unified force. Completing this rearm, we added another layer to that already strong

> cooperation. This gives us new operational agility, benefiting both nations and our ongoing work to support a free and open Indo-Pacific.

RAFAEL PERALTA is assigned to Task Force 71/Destroyer Squadron (DESRON) 15, the USN's largest forward-deployed DESRON and the U.S. 7th Fleet's principal surface force.

This is a significant additional strategic capability provided by Australia – not dissimilar to the RAN ability to reload Torpedoes to US Submarines. On the other hand, the facilities at Eden (and at HMAS STIRLING, on the west coast) are not connected by rail, or suitable for large scale ammunitioning of major combatants, and Amphibious shipping. This is one of the major logistic constraints facing Australia – if it is to achieve both strategic dispersal, and the rapid re-armament of maritime, air, and land forces operating from northern bases, and the Pacific Islands rim. Much of this was considered under the DSR – but funding has simply not been made available. Including for the East Coast submarine base, which was to have a dedicated rail-head link. So as to act as a strategic military port.

NAVY PURCHASE SMART SEA MINES FROM RWM ITALIA

The Navy will purchase new, smart sea mines, which will reinvigorate maritime mining capability. The mines are deployable from submarines, ships and aircraft. Delivery is expected to commence in 2023.

Following evaluation of market options last year, the Navy selected *RWM Italia* to provide the capability under a multi-million-dollar contract. The company was assessed as the market leading solution, demonstrating the ability to produce the quantities of sea mines needed, and the technical capability to meet ADF strategic objectives.

Rapidly deployable and technologically sophisticated, the smart sea mines will provide a new level of deterrence to potential adversaries.

The contract includes provision for the transfer of technology and expertise to Australia to enable local manufacturing and maintenance of the sea mines. This extends to providing electronics services and recurring maintenance; and potentially filling the sea mines with Australian-made explosives and assembling them in Australia.

JANGBOGO-III SUBMARINE OFFERED TO PHILIPPINE NAVY

South Korea's Hanwha Ocean has unveiled its latest proposal submitted for the Philippine Navy's (PN's) two-boat submarine requirement.

The submarine is based upon the The KSS-III (Korean Submarine-III) or *Dosan Ahn Changho-class*, which was considered as a viable alternative to the *Attack-class* submarine, if Australia had not decided upon the "nuclear option." [4, 5]

The *Jangbogo-III class* PN submarine, is derived from the Republic of Korea Navy's (RoKN's) KSS-III submarine, which has been designed and constructed by Hanwha Ocean. The proposed vessel has a surface displacement of about 2,800 tonnes, with an overall length of 77 m, and an overall beam of 9.7 m.

Hanwha Ocean states that Building upon the success of the Korean navy's (RoKN's) *Jangbogo-III* submarines, the *Jangbogo-III PN class* equipped with the latest propulsion system and lithium-ion battery technology ensuring the Philippines' enhanced defence capability to safeguard sovereign and strategic maritime interests.

RSS IMPECCABLE COMMENCES TRIALS

The second of four of the Republic of Singapore Navy *Invincible-class* (Type 218SG) diesel-electric submarines (RSS IMPECCABLE) procured by Singapore Navy arrived in the country in July, and the vessel will be undergoing local sea trials.

Trials are being conducted ahead of the boat's commissioning and are done as part of efforts to operationalise the vessel for regional application – according to the Singapore Ministry of Defence (MINDEF). The first of class, RSS INVINCIBLE, is understood to remain in Germany, where it is the training platform for Singapore crews, prior to its return to Singapore in 2024. At which time, training facilities are due to be established in Singapore.

RSS ILLUSTRIOUS is scheduled to be commissioned in late 2023, and RSS INIMITABLE is due to be launched in 2024.

Except for RSS IMPECCABLE, all the boats have illustrious predecessors in the Royal Navy.

SINGAPORE & INDONESIA BILATERAL EXERCISE EAGLE INDOPURA

The Republic of Singapore Navy (RSN) and the Indonesian Navy (TNI AL) conducted the 27th Exercise EAGLE INDOPURA, 22 to 27 August 2023 in waters off Batam. The RSN deployed a *Formidable-class* frigate RSS INTREPID, a *Victory-class* missile corvette RSS VIGOUR and a *Fokker-50* Maritime Patrol Aircraft. The TNI AL deployed a *Diponegoro-class* frigate KRI SULTAN ISKANDAR MUDA, with an embarked AS565 *Panther* helicopter, a *Sampari-class* fast attack craft KRI HALASAN and a CN-235 Maritime Patrol Aircraft.

At sea, both navies conducted a series of serials including gunnery firing, as well as air defence, communication and manoeuvring exercises. In addition, both navies exercised responses to maritime security threats, leveraging information provided by their respective operations centres and the RSN's Information Fusion Centre to track simulated vessels of interest.

The Commanding Officer of RSS INTREPID, Lieutenant Colonel Chua Sheng Hao RSN highlighted the significance of the exercise in enhancing professionalism and understanding between the two navies:

> Exercise EAGLE INDOPURA serves as a valuable platform for both navies to enhance our mutual cooperation and understanding. The exercise has also allowed sailors from both navies to collaborate, learn from one another, and strengthen warm ties of friendship and partnership.

Held since 1974, Exercise EAGLE INDOPURA is the Singapore Armed Forces' longest-running bilateral exercise with a foreign military.

JAPAN-FRENCH EXERCISE OGURI-VERNY

The Overseas Patrol Boat (POM) FS AUGUSTE BÉNÉBIG (P779) participated in the Franco-Japanese exercise OGURI-VERNY off the coast off New Caledonia with the JS SHIMOKITA (LST-4002), the second ship of the *Osumi-class* tank landing ships of the Japan Maritime Self-Defense Force (JMSDF).

The two ships conducted a sea training (PASSEX), combining different tactical manoeuvres to test the cooperation between the two ships, with the participation of the reconnaissance aircraft of the 25F Flotilla.

The Japanese vessel JS SHIMOKITA made a stopover in the port of Noumea where they were welcomed by Rear Admiral Kanezashi and Major General Nashinoki.

The exercise developed interoperability between the two navies through the implementation of standardised procedures.

The main tasks of the 1,450 personnel of the armed forces in New Caledonia is to ensure French sovereignty and to facilitate regional cooperation and to maintain privileged relations with all Pacific countries.

* The name OGURI-VERNY comes from François Léonce Verny (1837-1908) a French marine engineer who supervised, with Oguri Tadamasa Kosukenosuke, the senior official of the Imperial Navy, the construction of the Yokosuka naval arsenal.

USN/JMSDF/ROK BMD EXERCISE

USS BENFOLD (DDG 65) conducted a trilateral ballistic missile defence (BMD) exercise with Japan Maritime Self-Defence Force *Maya-class* destroyer JS HAGURO (DDG 180), and Republic of Korea (ROK)

Navy Sejong *Daewang-class* destroyer ROKS YULGOK YI I (DDG 992)

The exercise is a response to DPRK ballistic missile launches – representing a flagrant violation of unanimous UN Security Council resolutions; yet enabled by China.

The trilateral exercise followed the historic summit at Camp David, which brought together the leaders of the United States, Japan, and the ROK. At the first-ever standalone summit, the leaders jointly inaugurated a new era of trilateral partnership and reaffirmed cooperation between the United States, Japan, and the ROK.

USN AND RCN, EXERCISE NOBLE WOLVERINE

Arleigh Burke-class destroyer USS RALPH JOHNSON (DDG 114) is operating alongside the Royal Canadian Navy's HMCS OTTAWA (FFH 341) as part of Exercise NOBLE WOLVERINE in the South China Sea.

A wide-ranging northern hemisphere autumn exercise, NOBLE WOLVERINE involves sustained Surface Action Group (SAG) operations intended to improve interoperability between the allied navies and support a free and open Indo-Pacific (FONOPS). The exercise, takes place over multiple phases, involves manoeuvring drills, small boat operations and helicopter flight deck training, as well as routine bilateral surface operations.

The U.S. and Canadian ships also executed a combined at-sea replenishment with the *Henry J. Kaiser-class* underway replenishment oiler USNS YUKON (T-AO 202).

Commander Sam Patchell, commanding officer of HMCS OTTAWA, commented:

> By continuing to operate in the Indo-Pacific, the Royal Canadian Navy is building relationships with partner nations and reinforcing partnerships with our allies like the U.S. Navy. Joint exercises such as Noble Wolverine build a level of trust and interoperability that can only be forged at sea.

USS Ralph Johnson is forward-deployed to Yokosuka, Japan, and operates under Commander, Task Force (CTF) 71 and Destroyer Squadron (DESRON) 15.

Commander Isaia Infante, commanding officer of USS RALPH JOHNSON, noted:

> NOBLE WOLVERINE allows our allied sailors to work closely together at sea and grow that crucial interoperability as a fighting team. We know that people across the region share our dedication to a free and open Indo-Pacific, and we're excited to work with all of those partners and allies in pursuit of our shared goals.

Commander, Task Force 71 is U.S. 7th Fleet's principal surface force. CTF 71, responsible for the readiness, tactical and administrative responsibilities for forward-deployed *Arleigh Burke-class* guided-missile destroyers as well as any surface unit conducting independent operations in the region.

PLAN WESTPAC CSG

A large naval task force of the Chinese People's Liberation Army Navy (PLAN) entered the West Pacific (WESTPAC) in September to join forces with the aircraft carrier SHANDONG (CV 17) and form China's first large carrier strike group (CSG).

The JMSDF identified a total of eight PLA Navy warships in two flotillas that sailed from the East China Sea through the Miyako Strait into WESTPAC.

The PLA naval task force consisted of two *Type 052D* destroyers, two *Type 054A* frigates and a *Sovremenyy-class* destroyer in a first flotilla, and a *Type 052C* destroyer, another *Type 052D* destroyer and another *Sovremenyy-class* destroyer in a second flotilla, according to Japanese reporting.

According to the Taiwan defence authorities, the PLAN SHANDONG carrier strike group sailed 60 nautical miles southeast of Cape Eluanbi, the southernmost point of Taiwan, east toward the West Pacific for an exercise.

Taiwan Ministry of Defence later confirmed that it detected 20 PLA warships around the island of Taiwan from Monday morning to Tuesday morning in addition to 22 PLA aircraft.

KRI ALUGORO HOSTS HMAS WALLER

KRI ALUGORO (S405) - a *Nagapasa-class* submarine of the Indonesian Navy built by PT PAL in Indonesia and launched in April 2019 – CO, Marine Lieutenant Colonel Typhoon Agung Yuwono, welcomed the arrival of HMAS WALLER (S75), then docked at East Madura Pier Koarmada II. Colonel Yuwono expressed his gratitude and hoped that this meeting could foster brotherhood and good cooperation in the future.

FIRE ONBOARD HMAS FARNCOMB

The twenty-five-year-old HMAS FARNCOMB (S74) suffered an onboard electrical fire in August – which the crew was able to bring under control. Details of the incident, including where the submarine was located at the time, have been withheld but the events have been described as the experience as "concerning". It is unknown what repairs will be required and whether or not the submarine was able to complete its program. The *Collins-class* submarines had been due to start decommissioning this year, with FARNCOMB being one of the first to retire. The long legacy of Defence and Canberra – including the Abbott replacement program, the Turnbull *Attack-class* debacle, and now AUKUS – means that the *Collins-class* will be run on until the early 30s. Raising significant concerns as to their continued safe and effective operations. FARNCOMB is due to commence her Life of Type Extension (LOTE) in 2026.

A spokesperson reported "there were no injuries and the vessel continued its operations." Navy scuttlebutt suggests that submariners are calling the FARNCOMB the "Farn-kursk", a grim reference to the Russian submarine KURSK which sank with all hands in 2000. We will remember.

In September 2022, the Navy denied reports that HMAS FARNCOMB had been "stranded' in Hawaii while technicians were flown out from Australia to conduct repairs".

In December 2022, Indonesian military observers noted that HMAS FARNCOMB had remained moored in Surabaya for several days longer than planned, with a Royal Australian Air Force transport plane picking up "spare materials" belonging to the submarine in January 2023.

FROM BAD TO WORSE

The warning signs of the U.S. Economy could not be writ larger – indicated by the recent delayed shutdown of the Government, to November 2023 and removal of the Speaker. The withdrawal of funding for Ukraine should send warning signals to all U.S. Allies – even more so, if the Republicans win the 2024 Presidency. Republicans have already indicated that they have grave concerns about AUKUS and the transfer of technology and *Virginia-class* submarines to the RAN, in the early 2030s. A deeply transactional President is likely to have no sympathy for an Ally, in this case Australia – who has patently failed to maintain Defence expenditure under the DSR (and FSR), and invest appropriately in AUKUS and nuclear-powered submarines.

U.S. Economic Meltdown

The U.S. Economy is threatened with economic meltdown. The US Dollar is under increased threat by the *No Limits Axis*, the BRICS and the Shanghai Cooperation Organisation (SCO) – including potentially Saudi Arabia. All of which are seeking to replace the Dollar as the global reserve currency.

The U.S. is not prepared to fight a global conflict:

- As a share of economic output, US government debt is around 100 per cent of US GDP in 2023
- The U.S. budget deficit in the financial year ending September 30 was $US2 trillion, or around 6 per cent of GDP.
- If the U.S. is no longer the Global Reserve

Currency – or displaced as such – the U.S. would no longer benefit from reduced borrowing costs.

- Increasing interest rates and a long-term assault on the US Dollar by the BRICS nations, will mean debt being transferred to U.S. taxpayers – householders already saddled with debt and declining wages.
- The 10-year US government bond rate is at 4.7 per cent, the highest level in 16 years. Servicing government debt is going to take up a much greater share of the budget. By 2029, the ratio of interest to GDP will be 3.2 per cent, the highest since 1940. The U.S. already has wartime debt without having fought a war.
- To balance the budget by 2032 without touching Defense spending requires the budget to be cut by a third, or taxes increased by 33%.
- China and Russia are in better fiscal shape than the U.S., – meaning they could raise more, more quickly in the event of what US economist Harald Malmgren calls a " brutally expensive Global War."

U.S. Submarine Force?

As reported in *The NAVY* and confirmed by Mr. Seth Cropsey (President of the Yorktown Institute, writing in the *Australian*, 2 Oct 23) "the U.S. Submarine Fleet is in dire straits.":

- The US Navy's submarine fleet of about fifty boats, is in lamentable shape. Of the total U.S. fleet, about 40 per cent of vessels are in maintenance and repair at any given time. This puts the fleet at roughly 30 deployable boats at best, rather than the 40 to 45 expected at operating level.
- The US Navy is retiring two submarines a year on average, and building only three every two years, leading to a net annual decline. US production looks unable to reverse this. The issue is not just shipyards – but parts.
- The problem requires not only more spending but also greater creativity, since the fleet will shrink until the 2030s.
- A short-term solution is procuring conventionally powered submarines. Conventionally powered boats are easier to build and quieter.
- The U.S. lacks the domestic infrastructure to build conventionally powered boats.
- The recent (Aug 2023) U.S. Japan / South Korea summit makes possible military industrial co-operation – including the purchase and transfer of submarine technologies.
- Japan and South Korea are world leaders in submarine technology and have capacity:
  - Japan's *Soryu-class* submarine, a Mitsubishi-Kawasaki co-project, has a range of more than 6,000 miles.
  - Korea's *KSS-III*, a Hanwha-Hyundai product, slightly larger than the Japanese Soryu, can even launch ballistic missiles, broadening its mission profile.
- A non-nuclear fleet of up to 25 boats, while not providing the same combat capacity of *Virginia-class* nuclear-powered attack submarines, would provide an interoperable gap filler at much reduced costs. Able to sustain the U.S. maritime force into the 2040s, when U.S. Shipyards are projected to be able to build up to 4 nuclear-powered submarines a year. Necessary to sustain 100 USN submarines.

Better choice for RAN?

Dr Neil Baird concluded: [5]

- Each class (of submarine) has a Design Life – which for the *Collins-class* was declared at 30 years.
- From first of class commissioning, to last of class decommissioning (due in 2032), the *Collins-class* Submarine Force generates almost 100 years of [Design] Life. The nominal half-life is 3 years. The average Force Life is 2.69 years. See figure 1.

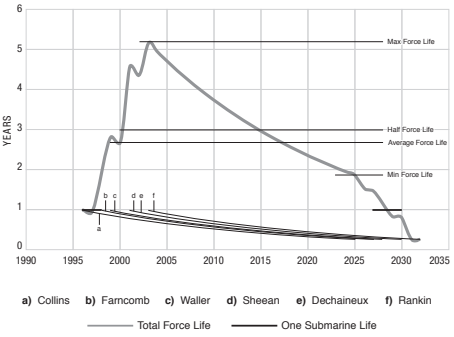


Figure 1: *Collins-class* Design Life versus Decay Rate

- Considering taking the *Collins-class,* and extending its Total Life from 2024, when COLLINS is due to achieve Design Life, and assuming it is realistic to restore back to Half-Life (by almost doubling individual hull life remaining) it may be possible to extend force life from 2024 to 2039, see figure 2.

Figure 2: *Collins-class* Theoretical Life of Type Extension (LOTE)

- Any LOTE is taking already *lifed* materiel and seeking to extend life-of-class beyond Design Life, or that of its component steel. In the case of the *Collins-class*, extending Force Design Life by almost a third (31 years).
- The two alternatives under Baird's analysis – equally weighted – are the Korean *Jangbogo (III)-class* extension (produced under licence with TKMS) and the Japanese *Tagei-class*.

Table 1: Submarine Replacement Weighted Options

Class	Allied Partner / Relationship	Regional Ally / Proximity	Trade & Defence Liaison	Logistics Chain	Extension Characteristic Modifications	Total Weighting
KSS-III (Jangbogo III) Extension	2	1	2	2	1	8
Navantia SA80 Extension	3	3	3	4	2	15
Type 212 CD Extension	3	3	3	3	2	14
Taigei-class Extension	1	1	1	1	4	8
Other European	3	3	5	5	5	21

- The only conventional (non-nuclear powered) SSG submarine that competes across all three sub-categories is the Korean *Jangbogo (III)-class*, built under licence to the German company TKMS – itself derived from the highly successful Type 212 class.
- The second choice, competing in two of the three sub-categories, is the Japanese-built *Taigei-class* (derived from the *Soryu-class*).

In sum, and as expediently and cheaply as possible Australia needs urgently to:

- Buy not just twelve, but at least 25 such (Korean or Japanese) boats, remembering always that we should be aiming to have more eggs in more baskets. They will be a fraction of the cost of the AUKUS SSN.

GREENWICH STATION

HMS TAMAR (P233) and SPEY's (P234) IndoPac program, now into its third year, continues to expand the effectiveness and utility of the Royal Navy's Offshore Patrol Ships, deployed East of Suez.

HMS TAMAR is spending the autumn – spring in the Southern Hemisphere – in and around Australia and Oceania, while SPEY will be concentrating her efforts around Central and East Asia. ■

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WRONG SIDE OF RENEWABLES?

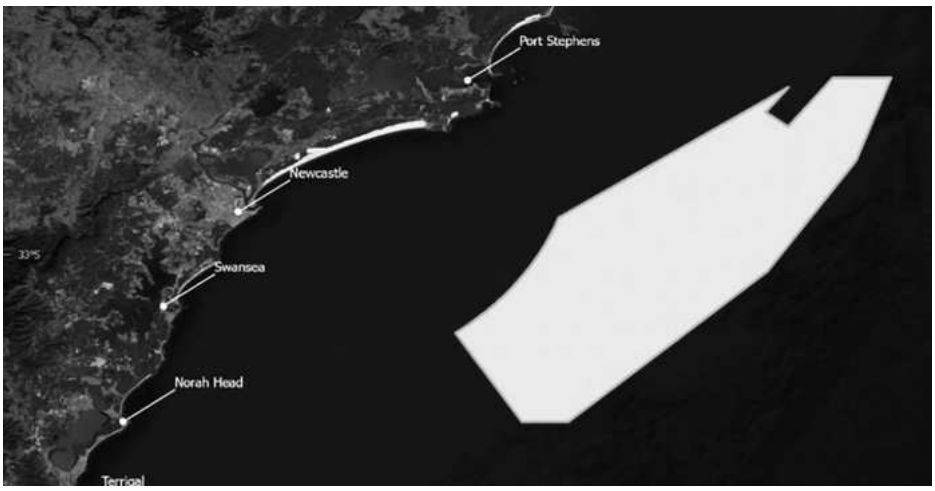
The Maritime Workers Union has continued its hand-in-glove relationship with the Government and ALP, through its wholesale and unequivocal support for Chris Bowen and the development of vast new offshore energy windmills off the coastline near the Victorian and South Australian borders, and off the coast of the Newcastle and Hunter Region. This despite growing opposition from local populations and seagoers, arguing that the windmills will do significant damage to the environment, flora and fauna, maritime industries, and add considerably to the costs of energy. While doing nothing to support reliable energy production (70% plus currently generated by coal) – necessary to minimise the environmental impact of renewables and vast grids of poles and cables taking power from remote hills and oceans to the cities. The unreliable nature of the power will never make it suitable for industry – now being priced out by the cost of energy.

The announcement comes after many years of advocacy by the Maritime Union of Australia calling for new clean energy jobs, a just transition for workers employed in hydrocarbon industries, and for a comprehensive plan to decommission and clean up disused offshore oil and gas infrastructure from the sea floor.

Claims – historical parallels

The Union claims that the offshore windfarms will add hundreds more new seafaring and port services jobs from Warrnambool in Victoria to Port MacDonnell in South Australia, and the NSW Hunter valley. There is little or no proof of this – in fact quite the reverse. There will be job creation largely in China – adding yet more to the reliance of Australia on China for its renewable energy. A position recognised to by the UKPM (Rishi Sunak) when seeking to address Chinese spying on the UK Parliament. The PM admitted that the reliance on Chinese industry – including on renewables – was limiting the ability of the UK to respond appropriately. Put simply, renewable energy is making Australia more reliant on imports – from dirty energy producers, like China – not less. So further sacrificing energy sovereignty to a non-allied power. Given the MWU opposition to nuclear energy, and AUKUS, this seems to be placing the union movement not only to the left of the ALP, but with historical parallels to WW2. When, up and until the German invasion of the Soviet Union, some Australian unionists sided with the National Socialists, then in alliance with Russia.

The MWU claims that its workers continue to benefit from the fast pace of investment and expansion of offshore renewable energy projects around our coastline. The Union's Assistant National Secretary, Adrian Evans went as far as to say:



NSW Hunter Valley Offshore Windfarm Zone

> These new jobs are a direct result of the growing investment in sustainable, reliable and clean renewable energy being unlocked by regulatory and legislative reforms which the MUA has been campaigning for over many years.

Not green, economic, or productive

The 1,800 square kilometre area off NSW will reach across the Hunter coastline, from Swansea to Port Stephens. An area which is home to one of Australia's largest ports along with several electricity grid assets and ageing coal fired power stations – that were due to be decommissioned in coming years. Until the NSW Government recently began to backtrack and extend coal power generation, as they woke up to the political and environmental damage being done by renewables – and to base load production. Let alone the impact on inflation, energy costs, productivity, and reliable (coal, oil, gas and nuclear) energy production.

According to Federal Government analysis, the offshore wind projects in this region will generate up to 3000 jobs during construction and 1560 jobs ongoing, many of which will be new jobs in the maritime sector.

Minister for Climate Change and Energy Chris Bowen said the declaration was another big step for Australia to reap the huge benefits of offshore wind.

> The Hunter is undergoing significant economic change, and the prospect of creating new job opportunities for decades to come through a new offshore wind industry is a game changer.

There is growing opposition to the expansion of renewable energy windfarms and the desecration of pristine oceans / areas of outstanding beauty. Including by Green and "old / Blue collar Labor" constituents, often living in adjacent communities. Increasingly, there is recognition (even amongst Greens) that nuclear power and SMR generation (see paper 4) – including by barges connected to existing / replacing coal powered reliable energy stations – has significant advantage. While also increasing Australia's sovereign capability – at reduced risk of foreign supplies / logistic lines.

A Path to 2025?

The union movement with encroachment into the RBA; influence on the Treasurer and his third wave economics; its setting of unemployment and interest rates; support from SUPA – additionally nobbled by this Government; along with championing renewable expansion and the Voice, may now be impacting Government standing. Taken together with devaluation of the dollar by 20% (since interest rates are not keeping up with inflation); a cost-of-living crisis; reductions in productivity; energy costs (up to 5 million Australians are now considered to be in energy poverty); inflation, and persistently high interest rates, the Government's popularity and competence is being questioned.

The British Government, in seeking re-election in 2024, has significantly reduced its withering Carbon Neutral policies. Policies that added significantly to inflation; did little (in global terms) to address carbon production; reduced productivity; increased reliance on China; and impacted mostly the lower socio-economic classes. Who, unlike the inner-city elites (ICE), might not be able to afford to "heat and eat," or purchase EVs. EVs that get power from somewhere (hi-power poles and cables) – and pose significant environmental hazard, not only on disposal.

It has been estimated that placing renewables back into the energy market, along with the reduction of subsidies, green tape, and green laundering, could increase productivity by 4-5%. So, reducing inflation and restoring national wealth. At the same time, reducing sovereign risk. Such popular policies may well make the UK Conservatives electable in 2024, or the LNP in 2025? ■

RAN SHIP PROPULSION

FROM SAIL TO TURBINE

By Dr Dario Delgado

Trade is an important societal aspect in the world. Until the invention of the aircraft, the initial methods of transportation were by land and sea. Controlling these routes of transportation gives a great advantage to a nation's economy. Wars have been fought to acquire this benefit. The seas provide a way to transport goods and are a resource to exploit with fishing and mining. The oceans of the world are a platform that nations want to control. In this respect, having a method of transport to protect this control that is fast and long-range brings substantial advantages to the navy. Constant innovation is essential to make marine propulsion.

Turkish Galley and Dutch Ship off the Coast - painting by JA Bellevois, 1663, Museo del Prado.

PROPULSION BEGINNINGS: OARS AND SAILS

The first considered method of marine propulsion is the use of oars. They have been used for propulsion since the earliest of times and were an improvement on basic paddles. One example of this early use is the trireme war galley which included square sails; this is an ancient vessel with archaeological evidence dating back as early as the eighth century BC (McIntosh, 2021). This type of ship was used for naval combat, for example, in the Persian invasion of Egypt in 525 BC (Herodotus, 1920). Rowing was used in naval wars in ancient history. However, using manpower is limiting in terms of range and speed and the sails in the trireme could not propel in the absence of wind.

SAIL PROPULSION

A substantial improvement was the implementation of the lateen sail in the second century (Encyclopedia.com, 2022). The most prominent sail shapes were the square and lateen (High Tech, High Seas: Propulsion, 1999). The main difference between these two types of sails is the propulsion acquired from the direction of the wind — the lateen covers a broader range of directions. One example is HMS MARY ROSE (launched in 1511) (Colledge, 2006), a British warship with square and lateen sails. The combination of these two types of sails was based on the engineering constraints of the time. It gives the efficiency of the square sail and the multidirectional coverage of the lateen. This combination of sails proved to be highly efficient and even modern sail ships such as the STS *Young Endeavour* uses it (RAN, 2022f).

STEAM ENGINE PROPULSION

The steam engine was invented in 1698 by the British engineer Thomas Savery (Kelly, 2019). The first example of a steam engine for propulsion was the Clermont designed by Robert Fulton in 1807 (Bellis, 2019). It employed a paddle wheel as the method of propulsion. Its initial introduction proved to be costly to operate and was prone to mechanical breakdown. This method of propulsion is not effective for rough waters thus navies did not consider it the sole method for marine propulsion (High Tech, High Seas: Propulsion, 1999).

In 1838, Swedish engineer John Ericsson introduced the first screw propeller patent for marine propulsion (Ericsson, 1838). The *Great Britain* of 1843 built by Brunel was the first screw-propelled vessel ever made and was the starting point for modern powered ships (CAPT Claxton RN, 1845). The RN in the 1840s incorporated paddle wheel propulsion in their ships and screw propulsion was introduced in the 1850s (High Tech, High Seas: Propulsion, 1999). However, these ships could only travel as fast as six knots, for example, HMS AMPHION (Colledge, 2006), and steam propulsion was used as an alternate method in the absence of wind (High Tech, High Seas: Propulsion, 1999).

In 1853, British engineer John Elder developed the double expansion steam engine (ie marine engine) (Scottish Engineering Hall of Fame, 2022). This engine increased power and cut fuel consumption in half. As the triple expansion engine was developed after WWI, it overtook sail as the most reliable and economical means of propulsion (High Tech, High Seas: Propulsion, 1999). For example, the RN *River-Class* frigate (1941 to 1944), composed of 138 ships, all were triple expansion (Colledge, 2006). By employing the steam engine, the private sector was the driver of naval innovation.

Model of HMS MARY ROSE I - National Maritime Museum, Greenwich, UK.

Sir Charles Algernon Parsons.

HMS AMPHION I.

TURBINE PROPULSION

English engineer Charles Parsons began experimenting with the steam turbine and in 1894 he built the *Turbinia* (Royal Museums Greenwich, 2022). This ship powered by a steam turbine reached a speed of 34.5 knots, 10 knots faster than most warships at that time (High Tech, High Seas: Propulsion, 1999). In 1897 the RN held the Portsmouth Naval Review (Smith, 2015), and this demonstration convinced the RN to incorporate this engine in their destroyers. The piston vibration imposed a speed limit in steam engines — a limitation that turbines do not have. Despite the increase in speed of steam turbines, they boil large amounts of water, have a lengthy start-up time and a large footprint. However, this is an example of early innovation by the Navy.

Upon its foundation in 1911, the RAN acquired the destroyers HMA Ships YARRA and PARRAMATTA (RAN, 2022g) which were propelled by steam turbines having a maximum speed of 26 knots (RAN, 2022c). The RAN does not currently have any ship propelled by a steam turbine (RAN, 2022e). As previously mentioned, the disadvantage of this type of engine is that it is unsuitable for naval propulsion, with the exceptional case of USA Navy aircraft carriers (USA Navy Office of Information, 2021).

GAS TURBINE PROPULSION

In 1947, the RN tried retrofitting a jet aircraft engine (Smith, 2011a) for marine propulsion with the first gas turbine ship HMS BOLD PIONEER in 1951 (Smith, 2011b). This solution brought excellent results: 43 knots of speed and a quick start-up time but with high fuel consumption (British Military Powerboat Team, 2004). RAN warships of the classes Canberra, Hobart and Anzac employ gas turbines. These ships can achieve speeds from 20 to 28 knots (RAN, 2022e). The first RAN ships to use gas turbines were the *Adelaide-class* in the 1980s (RAN, 2022a; RAN, 2022b). It took nearly 30 years for the RAN to acquire gas turbine ships since the first demonstration of this technology. This proved to be negative for the RAN as it is essential to close the technology gap to be capable of winning at sea.

DIESEL ENGINE

The diesel engine was invented in Germany in 1893 (Universal Technical Institute, 2022). These engines are fuel efficient, operate at a modest speed, are easy to maintain, are simple engines, and have few moving parts. They are not as fast and powerful as gas turbines but are a good choice for low-speed cruising (High Tech, High Seas: Propulsion, 1999). RAN warships have a combination of gas turbine and diesel engines as these engines are fit for different speed regimes (RAN, 2022e). The power curve diagrams of diesel engines and gas turbines differ substantially as a function of speed (rpm). For cruising speeds less than 20 knots, diesel engines are better employed while gas turbines are more efficient operating close to maximum speed.

NUCLEAR AND ELECTRIC PROPULSION

It is of particular interest to consider nuclear power and the return of electric ships. AUKUS is a trilateral agreement that will assist Australia in acquiring nuclear propulsion which brings several advantages, such as high range and stealth (RAN, 2022d). In contrast, autonomous technology employs electric propulsion which is currently being considered by the RAN (Defence News, 2022; Defence News, 2021). These are great examples of how the RAN is diversifying and enhancing its capability which is aligned with the excellence of ADF values. The RAN has learned to close the gap between state-of-the-art technology and the currently employed RAN technology.

Electric propulsion is currently being employed in the RAN with the examples of the ship classes Canberra and Collins (RAN, 2022e), It is used in the *Collins-Class* submarines to propel them when submerged and, in the Canberra class, in addition to their gas

MV Turbinia Gatecrashes the 1897 Spithead Review.

HMS BOLD PIONEER (P5701).

turbine and diesel engines which improve manoeuvrability at low speeds (e.g., docking) and redundancy. Other RAN ship classes use electrohydraulic and hydraulic propulsion, but this is beyond the scope of this article. Electric propulsion reduces fuel consumption by being more efficient than diesel. Pollution is also reduced as it is environmentally friendly. Finally, it has high torque at low rpm which brings benefits when operating in cold temperatures.

CONCLUSION

The selection of engine types, or a combination thereof, is based on several engineering considerations but the dominant ones are maximum speed, fuel consumption (ie range at cruise speed), footprint and redundancy. Since the RAN's foundation, the propulsion technology employed in RAN ships has mostly been decades behind and highly dependent on allied support. The AUKUS agreement will assist in closing the propulsion technology gap, making the RAN more independent and bringing far superior war capability. ■

Two barge-mounted Small Modular Reactors onboard Russian vessel Akademik Lomonosov supply power to the remote arctic town of Pevek (2019).

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FROM TEDIOUSLY SLOW AND RIDICULOUSLY EXPENSIVE TO CATASTROPHIC

A HISTORY OF AUSTRALIAN NAVAL SHIPBUILDING, 1949-2023

By Dr Neil Baird

Since its establishment in 1911, the Royal Australian Navy has acquired several hundred warships, patrol boats, support vessels and submarines. Very generally, most of those that were purchased on a 'fully imported' basis have been acquired close to 'on time', 'on budget' and relatively 'free of faults', except when the RAN has decided to substantially modify them before they entered service. Paper 1 examined the period 1911-1948. Paper 2 examines the period 1949-2023.

The two articles (1911-1948 and 1949-2023), the first appearing in this issue of *The NAVY*, were taken in their entirety from Neil Baird's forthcoming book *Australia and the Sea: An Encyclopaedic Maritime History.* It is expected to be published in 2025. [1]

INTRODUCTION

Apart from during World War II, when there were many notable ship and boat building successes, thanks, largely, to competent civilian oversight of construction projects, most local naval shipbuilding and modification projects have varied from the tediously slow and ridiculously expensive to the catastrophic.

The reasons for such problems are well known, as can be seen below, but they seem to be almost impossible to avoid. Essentially, Australian naval officers are brave enough and appear to be competent ship handlers and shooters. A competent, aggressive captain can make even an inadequate ship effective but the opposite most definitely does not apply.

Apart from recommending a ship purchase, I have concluded that "naval officers should not be allowed anywhere near the acquisition, construction or outfitting process." They and their bureaucratic masters, the 'Canberra Factor' (through the *Canberra Industrial Complex*) which adds the completely unnecessary 'Canberra margin' to the price of every ship, are the main cause of the RAN's unacceptable cost increases and delays. [2] Australian governments' vessel acquisition processes, not solely of naval vessels, are dangerously and expensively inadequate. They must be dramatically and rapidly reformed.

This analysis is divided into two parts. The first considers the largely more successful first 38 years of the RAN's existence, including two world wars. The second, the more dismal failings after a brief period of "success" into the 1970s, covering the period 1949 onwards.

Those ships that performed notably in action or whose construction successes or, more commonly, failures, deserve praise or caused controversy are described below.

HIS AND HER MAJESTY'S SHIPS, 1949-2023

HMAS ADELAIDE II. Was the lead ship of the *Adelaide-Class* of long-range escort frigates derived from the USN *Oliver Hazard Perry-Class* frigates. She was built at the Todd Pacific Shipyard in Seattle, USA. Commissioned in 1980, she was Australia's first gas turbine powered warship. Due to the 'Canberra Factor', she and her sisters were delivered roughly five times over budget [4]. She gave good service until decommissioning in 2008. Controversially, she was scuttled off Avoca Beach, NSW, in 2011.

HMAS ADELAIDE III and **HMAS CANBERRA III**, are LHD, (Landing Helicopter Dock) ships and, at 27,500 tonnes, the largest ships ever built for the RAN. They carry four large landing craft, many vehicles, six helicopters and up to 1,100 troops. Unfortunately, they have suffered many propulsion system and other problems since their delayed commissioning in 2015. Their diesel electric podded drive propulsion systems are complex by naval standards although in common use commercially. Built, mostly in Spain to a well-proven Spanish Navantia design, they were substantially modified significantly to suit RAN requirements and were fitted out by BAE (formerly Tenix) at Williamstown. ADELAIDE III embarrassingly lost power during a disaster relief mission to Tonga in 2022. Both ships have spent much of their careers berthed alongside at Garden Island in Sydney although *Adelaide* once conducted a successful anti-drug smuggling mission in the Southern Ocean. While having the appearance of aircraft carriers, they are unable to serve as such.

HMAS ANZAC II. Was, like its sister ship HMAS TOBRUK, a much-modified British designed *Battle-Class* destroyer that was ordered from Williamstown Naval Dockyard in 1944 but not delivered until 1951. In what was becoming a pattern of pathetic excuses for the late delivery of Australian warships, 'post war labour shortages' were blamed for the delays. However, by contrast, HMAS ANZAC III was the lead ship of ten German designed MEKO *Anzac-Class* 3,600 tonne frigates built at Williamstown in one of Australia's most successful ever warship building projects. The project, led by Tenix, commenced in 1992 and the frigates were commissioned from 1996 to 2006. All continued to provide good service at the time of writing in 2023.

HMAS ANZAC III (D59).

HMAS ARAFURA. Is the first of class of the proposed *Arafura-Class* of 12 corvette/OPVs that had become increasingly controversial less than half way through their construction programme at the end of 2022. The class of 12 boats was intended by the RAN to replace 26 existing vessels including the *Armidale-Class* of OPVs, some mine hunters and survey craft, with modular, multi-mission vessels. Designed by Lurssen of Germany and with two built in conjunction with ASC Shipbuilding in Adelaide and the remainder with CivMec at Henderson near Perth, the programme, as usual, appears to have drifted significantly off course. The boats, based on a successful corvette design, have been drastically 'defanged' or under-armed and otherwise modified by the Canberra 'experts' and are now generally regarded as being only appropriate to policing or coastguard, not naval, operations. At the time of writing, suggestions were being made that the Arafuras should be transferred to Border Force and an entirely new class of well-armed corvettes built to replace them [7]. Confusion and chaos reign as usual.

HMAS ARMIDALE II is an *Armidale-Class* patrol boat built of aluminium in Henderson, WA by Austal during the early 2000s. It is scheduled to be phased out to be replaced by one of the *Armidale-Class* of 'corvettes' in 2023.

HMAS ARUNTA II is one of the successful *Anzac-Class* frigates completed between 1996 and 2006 by Tenix at Williamstown. All remained in service at the end of 2022.

HMAS ATTACK I. The first in class and name ship of the small *Attack-Class* of steel hulled coastal patrol boats that were delivered to the RAN from a number of shipyards, mostly Evans Deakin Industries, from 1965. They were simple 34 metre LOA boats that served the country well for more than twenty years.

HMAS ATTACK II. Was to be the lead ship of the French designed *Attack-Class* of submarines recklessly and spitefully ordered by the Turnbull government in 2015 to replace the sensible order for Japanese built boats placed by the Abbott government two years earlier. They were to have been constructed at ASC in Adelaide with considerable local content. Their inappropriate design was for a diesel boat modified from a nuclear-powered submarine. The project budget blew out rapidly, as is normal for locally constructed RAN submarines. So did the construction timeline as the promised proportion of Australian content steadily decreased. The order was controversially and expensively cancelled in 2020 by the Morrison government. That was, however, the only logical decision.

HMAS ATTACK II - abandoned *Attack-class* submarine.

HMAS BALLARAT II. Was a *Fremantle-Class* patrol boat built in Cairns by NQEA in the early 1980s.

HMAS BEACONSFIELD II. Was a *Fremantle-Class* patrol boat built to a British design at Cairns by NQEA in the early 1980s.

HMAS CANBERRA II. Was an American built, 4,200 ton, FFG of the *Adelaide-Class* of which six were built for the RAN and modified from the U. S. Navy's *Oliver Hazard Perry-Class*. Ordered in 1977 from the Todd Pacific Shipyard in Seattle, she was commissioned in 1981 and decommissioned in 2005. While narrow ships with, unusually, two gas turbine main engines powering one propeller, the FFGs served the RAN well.

HMAS CANBERRA II (FFG02).

HMAS CANBERRA III. See **HMAS ADELAIDE III**, above.

HMAS CHOULES. Is the former British RFA Largs Bay. A 16,200 ton, 177 metre *Bay-Class* Landing Ship built somewhat controversially by Swan Hunter and BAE in the UK . Delivered in 2006 after the seemingly inevitable cost and time over runs that resulted in her construction taking four years. Following her eventual delivery she suffered fires and mechanical problems, particularly with her diesel electric AZD propulsion system. Purchased by the RAN for AUD 100 million, she was delivered in 2011 and, despite an extensive refit and 'tropicalisation', further breakdowns occurred that kept her out of service for two years. The ship, theoretically, can carry 32 MBTs, an LCM or two LCVPs, 200 tonnes of cargo and 700 troops for 8,000 nm at 15 knots. She can also embark, but not hangar, two helicopters. Since her mechanical repairs in 2013, she has mainly been involved in disaster relief operations although they are hampered by her draft of 5.8 metres. She is very lightly armed and slow at 16 knots. Apparently, she was due for replacement by two new vessels at the time of publication. *Choules* has turned out to be yet another ill-conceived and poorly executed purchase of a second hand vessel.

HMAS COLLINS. Was the first of six *Collins-Class* diesel submarines built by ASC in Adelaide to Swedish Kockums/SAAB designs. Their very controversial, expensive, late and mostly unsatisfactory building programme commenced when the vessels were ordered in 1987. The first 88 metre, 3,407 tonnes, submerged, boat HMAS COLLINS, having commenced construction in 1990, was commissioned in 1996 and continued to serve occasionally at the time of going to press. Sister ships HMAS SHEEAN, FARNCOMBE, DECHAINEAUX, WALLER and RANKIN had all been commissioned by 2002 but all the staggeringly expensive boats suffered from very limited availability throughout their careers. They clearly illustrated the folly of local submarine building, particularly at ASC. They proved conclusively that welfare should never be an objective of naval shipbuilding projects. Nor should the significant modification of foreign designed vessels. That never succeeds.

HMAS COLLINS (SSG 73) - image ABIS C Szumianski.

HMAS COOK. Was an oceanographic survey vessel delivered to the RAN from HMA Naval Dockyard, Williamstown in 1980 following a chaotic seven-year design and construction process. The 2,450 ton, 97 metre ship only served for ten years, during which time it spent two years in its builder's hands while various construction faults were rectified. It was yet another Australian government shipbuilding catastrophe with the unsatisfactory ship soon sold to become a Greek cruise ship and even failed at that. The usual pathetic bureaucratic excuses were trotted out.

HMAS COOK.

HMAS DELORAINE II. A *Fremantle-Class* patrol boat built by NQEA in Cairns in the early 1980s.

HMAS FLINDERS. A Royal Australian Navy hydrographic survey vessel which, among other hydrographic achievements, while commanded by Lt Commander G. J. Bond RAN, in 1982 charted Hydrographers' Passage through the Great Barrier Reef to provide a shorter and safer route for coal ships loading at the Hay and Abbot Point terminals on the central Queensland coast. The work was completed and chart published in 1984. Constructed at *HMA Naval Dockyard Williamstown*, she was commissioned in 1973 and operated, despite many on-going defects, remarkably successfully until 1998. Upon decommissioning she was sold for conversion to a yacht.

HMAS FREMANTLE II. Was first in class of the 15 unit F*remantle-Class* steel and aluminium, 200 ton, 49 metre, 30 knot coastal patrol boats. She was built at Brooke Marine in the UK in 1981 with her sisters being built at NQEA in Cairns soon afterwards. While built in a commercial shipyard, NQEA, the construction programme was handicapped and made ludicrously expensive by incessant bureaucratic interference. Still, by RAN standards they were probably comparatively economical vessels both in capital and operational terms even though, as their builder explained to the author, their 'Canberra margin' was of the order of 150% plus. The class operated successfully from 1981 to 2005 when replaced by the all-aluminium *Armidale-Class*, built by Austal at Henderson.

HMAS HOBART II. Was a slightly modified *Charles F. Adams-Class* DDG or guided missile destroyer of 4,618 tons, 135 metres LOA and 35 knots. The very elegant steam turbine powered ship was built largely on time and on budget by the Defoe Shipbuilding Co of Michigan, USA for AUD 45 million. Commissioned in 1965 she served and served well, including three tours of Vietnam, for 35 years until 2000. Another very successful acquisition of a complete ship from a foreign shipyard.

HMAS HOBART III. One of the three ship *Hobart-Class* of elegant gas turbine powered AWDs or Air Warfare Destroyers of 7,000 tons, 147 metres LOA and 30 + knots. Constructed jointly by Navantia of Spain and ASC/BAE Shipbuilding, the three ships appear to be a rare comparative success for anything in any way connected with ASC. However, *Hobart's* commissioning in 2017 occurred five years after she was laid down in 2012. The almost certainly inevitable cost over-runs have been difficult to discern. Yet again, the ships are clearly under-armed.

HMAS HUNTER. The mythical lead ship of the nine vessel 2020s *Hunter-class* of large (10,000 ton) multi-role frigates ordered from BAE Shipbuilding subsidiary, ASC Shipbuilding in 2018. Based on the already troubled, and significantly under-armed, British Type 26 design, the ships, which are not expected to commence being delivered until 2031, already appeared doomed by the end of 2022. As with anything connected with ASC, the ships were already late and expensive 12 months after construction actually commenced in 2021. If, as seems increasingly unlikely, the ships are ever delivered, it seems certain that their already obscenely high projected price of $4 billion per ship will be exceeded significantly. In any case, they appear, like the *Arafura-class* corvettes/OPVs and *Hobart-class* destroyers, to be grossly under-armed [8].

HMAS JERVIS BAY I. Was the 3,250 dwt, 1969 Newcastle State Dockyard built, former ANL Ro-Pax ferry *Australian Trader* that, after an unsuccessful eight year commercial career was sold to the RAN in 1977 as a very expensive officer training ship. It was paid off in 1994 and sold to Greek owners.

HMAS JERVIS BAY II. Is a 1997 built, 87 metre Incat, aluminium catamaran Ro-Pax ferry that was chartered by the RAN and extensively and effectively used by the Navy for logistics support during the invasion of Timor Leste in 1999-2002. It has continued to operate very successfully on a commercial basis ever since [9].

HMAS JERVIS BAY II (AKR-FSC 45).

In sharp contrast with **KANIMBLA I**, **HMAS KANIMBLA II** was a typically disastrous RAN purchase of a second-hand ship. Originally the LST *USS Saginaw*, built by NASSCO in 1970, she was purchased by the RAN in 1994. Given the inevitable RAN re-conditioning and 'improvement' treatment, she was detained at Forgacs shipyard in Newcastle for a one-year refit that eventually lasted four years. Several fires and corrosion problems later and after serving in the Persian Gulf and Timor Leste, she was decommissioned in 2011 and sold for scrapping in 2013.

HMAS LAUNCESTON II was a *Fremantle-class* patrol boat built at NQEA in Cairns during the early 1980s.

HMAS MARYBOROUGH I and II. Were the usual combination of a *Bathurst-class* minesweeper/ corvette of World War II and a 1980s built *Fremantle-class* patrol boat.

HMAS MELBOURNE II was a British, Vickers Armstrong, 1945 built *Majestic-class* light (or Escort) aircraft carrier of 15,700 tons, 214 metres LOA and 24 knots top speed that managed to ram and sink two Allied destroyers, *HMAS Voyager* in 1964 and *USS Frank E. Evans in 1969*, killing a total of 154 crew members, surely a unique achievement in naval history. Otherwise, given her size limitations, she served the RAN effectively for 25 years.

HMAS MELBOURNE III was an *Adelaide-class* guided missile frigate (See above) built successfully, albeit well over budget, in Seattle, USA and that served the RAN for 27 years until 2019.

HMAS OXLEY, and her *Oberon-class* sister-ships, *Onslow*, *Otway*, *Orion*, *Ovens* and *Otama* were undoubtedly Australia's most successful, reliable and quiet submarines. Conventionally diesel electric powered and of 90 metres LOA and 2,430 tonnes submerged displacement, they were sailed to Australia complete from their UK builder, Scotts Shipbuilding and Engineering of Greenock, from 1967 to 1978 and served very satisfactorily until 2000, having been ordered in 1963 at what now seems the remarkable price of five million pounds per boat.

HMAS PARAMATTA II, a *River-class* frigate, was delivered in 1961, eleven years after being ordered. One sister-ship, to *Paramatta II*, *HMAS Yarra III* was delivered at the same time. Two more were delivered two and three years later again. All the usual naval shipbuilding excuses were proffered.

ADV Reliant. Its purchase was yet another example of why the RAN and Defence should never be allowed near the Commonwealth cheque book. In 2022, smelling an enticing bargain, they were enticed into paying about four times its market value for a completely unsuitable OSV to operate as a so-called 'Pacific Support Vessel'. Intended to carry out 'disaster relief', the vessel is far too complex, deep drafted and slow to ever be useful. Meanwhile, it has required expensive modifications to adapt it to its naval role. Bob Moyse, in *The Strategist*, penned a devastating critique of its purchase [10].

HMAS RUSHCUTTER. Along with its sister-ship *HMAS Shoalwater* were a pair of innovative FRP mine hunting catamarans built by Carrington Slipways in Newcastle and completed in 1987, four years late, following a gestation period of 13 years. Carrington was widely blamed for the delays but it appears far more likely that the usual Canberra chaos of bureaucratic dithering and naval mind changing was to blame.

HMAS STUART II. A *River-class* frigate that was ordered in 1950 and, as is so often the case, completed thirteen years later in 1963 at Cockatoo Island Naval Dockyard. Her sister ship, HMAS DERWENT was completed a year later. The loss of the *Daring-class* destroyer HMAS VOYAGER in 1964 led to the panicked ordering of two additional *River-class* frigates. Within six months the RAN decided to completely 'update' the design of the ships. Chaos ensued and the effect was described as devastating. The ships took six years to complete. As usual, drawing and material delays were blamed. The outcome was a well justified and long-lasting wariness on the part of government regarding the local construction of warships. The final two ships of the class were not delivered until1970.

HMAS SUCCESS. In 1979 Cockatoo Dockyard was contracted to build the Fleet Underway Replenishment Ship *HMAS Success*. Built to a French naval design, this was not, on the face of it, to be a simple task. However, despite costing 20% more than the same ship built in France, the project was regarded as very satisfactory. Some 82% of the vessel's cost was claimed (by politicians) to have been spent in Australia [11].

HMAS SYDNEY III. Was a sister ship to HMAS MELBOURNE II (See above), a British built light *Majestic-class* aircraft carrier of 15,700 tons originally commissioned as *HMS Terrible* in 1946. She transferred to the RAN in 1948 and served valiantly as an aircraft carrier in Korea and Malaysia before, in 1963, being converted to a fast troop carrier. She served as such during the Vietnam War until 1972 after which she was de-commissioned.

HMAS SYDNEY IV. Was a modified, American built *Oliver Hazard Perry-class* FFG of the RAN's *Adelaide-class* (See above).

HMAS SYDNEY V. Is one of the three *Hobart-class* DDGs (See above). She entered service in 2020.

HMAS TOBRUK II. Was a British designed 3,353 tonne Landing Ship Heavy built at Carrington Slipways and commissioned in 1981. While completed almost on time, she cost 42 per cent more than budgeted, thanks largely to bureaucratic interference and strikes. Also, thanks to a strange Canberra decision to change from its specified engines, she was notoriously unreliable.

HMAS VAMPIRE II, HMAS VENDETTA II, HMAS VOYAGER II and **HMAS WATERHEN II.** Were British designed, all-welded, *Daring-class* destroyers ordered, two each, from Cockatoo Island and Williamstown naval dockyards in 1946. As was becoming the norm with Australian warship building, VOYAGER was completed in 1957, VENDETTA in 1958, and VAMPIRE in 1959. WATERHEN II was cancelled. All the usual excuses for such delays such as lack of skilled labour; late delivery of drawings; and, lack of castings, forgings and structural steel, were trotted out. Remarkably, they turned out to be good ships that performed better than their British sisters.

HMAS VOYAGER II. A *Daring-class* destroyer was rammed and sunk by the aircraft carrier HMAS MELBOURNE off Jervis Bay, NSW, in 1964. There were 82 fatalities including the ship's captain.

HMAS WESTRALIA II. Was another second-hand ship with a troubled career. Delivered originally from an English builder in 1976 as a *Star-class* product tanker, the 171 metre, 16 knot TSMV operated commercially for three years. For the next ten years she served the Royal Fleet Auxiliary before being leased, then sold, to the RAN in 1980. She served mostly in South East Asia until 1990 and then in the first Gulf War. After significant engine repairs, she suffered a major, fatal and very controversial engine room fire in 1998. Six more months of repairs later, she returned to service until decommissioning in 2009 after 17 years with the RAN.

PEACETIME BUILDING COMPROMISES WARTIME THINKING

On the advice of WWI hero and noted engineer, General Sir John Monash, AUSTRALIA II and CANBERRA I were built in Britain at an estimated 50% cost and time saving over local construction.

Monash was correct and it is sad that few subsequent Australian governments have heeded his advice re the perils of local construction of large, complex warships.

Given that very chequered history, it is obvious that the RAN has had very serious problems with its peacetime warship acquisition processes. The Commonwealth government is very well aware of Navy's continuing flow of catastrophic decisions [12]. Successive governments, especially since World War II, have promised to improve its acquisition processes but they never have. So, what is to be done about it? ■

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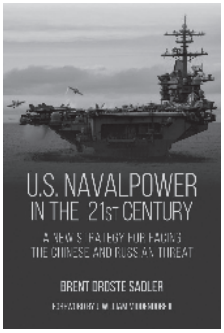
www.wikipedia.com. A vast amount of useful and well-documented material on most of the ships mentioned can be obtained from Wikipedia.



U.S. NAVAL POWER IN THE 21ST CENTURY

A New Strategy for Facing the Chinese and Russian Threat

By Brent Droste Sadler

USNI Published: May 15, 2023
ISBN-10: 1682477770
ISBN-13: 9781682477779
Hardcover: $62.50

Brent Droste Sadler is a USN submariner with 26-years' service He has been a member of personal staffs of senior defence department (DoD) leaders and a military diplomat in Asia. Sadler writes:

> *Strategies, by design, involve long-term time horizons that too often lead to admiration but not action.*

To overcome this bureaucratic inertia and execute through to 2035 the recommendations Sadler makes for a fundamental redesign and rebuild of the USN, a plan for action is needed – Sadler calls "Sailing Directions". Recalling also the 17th Century, we might consider also the "Fighting Instructions", as devised by Cromwell's General at Sea, Robert Blake. Sadler argues that "to participate effectively in great power competition, the Navy must accomplish two corporate objectives as it moves ahead:

1. Retain public confidence while better competing in the peacetime day-to-day contest with China and Russia.
2. Develop and build a fleet that can win wars and be reconstituted quickly during and between wars".

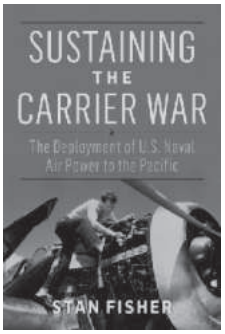
Therein lies a problem – the emphasis on what the Navy should be doing, and what the bureaucrats and indeed Presidents, "imperatively" should provide: "clear commitment… as well as the naming of a leader charged with overseeing and ensuring coherent policy execution, the mission being to drive robust local community engagement and congressional, industry, and U.S. government action." From what we have seen recently of the U.S. Government, none of this is likely, probable, or even possible.

Sadler does not sufficiently address the economic and budgetary constraints:

> In the 1980s, the Navy consumed an average of 34.3 percent of a defense budget that averaged 5.8 percent of the nation's GDP. Today, despite efforts to grow to 355 ships since 2016, the Navy averages only 29 percent of a defense budget that accounts for only 3.2 percent of GDP. Had the Navy maintained a flat budget and not been squeezed for a peace dividend, its budget would have been $75 billion (AUD) larger in 2021. Moreover, representing a decades-long divestment of naval power, from 1989 to 2020 the Navy has contributed over $1.8 trillion toward the so-called peace dividend.

Put simply, the economics, the budgets, the designs, the builds, and the ships no longer work or are affordable in the modern clime. Fundamentally, the USN (and U.S. Defence) needs to be recapitalised – which is not going to come from Government. Until the designs, match the builds and ships, there will be no corporate investment. The critical question is getting the markets involved in capitalising the designs, builds, and ships – and holding Defence and Governments to account. There is no more public money. U.S. debt is growing and likely to get larger. As per the USSR in 1985, the U.S. is bankrupt and potentially about to lose the Hot Peace, as the USSR lost the Cold War, without firing a shot. This, fundamentally, returns to the designs proposed by ANSON – underwritten by City of London Venture Capital, and effective commercial versatile modularisation of fleets… [1, 2]

In sum a significant contribution, great summer read, and an important one as we contemplate Xi's Taiwan clock to 2025-7. Sadler gets "two out of three" of his arguments right – "which is not bad."



SUSTAINING THE CARRIER WAR

The Deployment of U.S. Naval Air Power to the Pacific

By Dr Stan Fisher

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ISBN-10: 1682478475
ISBN-13: 9781682478479
Hardcover: $52.50

Dr Stan Fisher, is a Commander in the U.S. Navy, an assistant professor of naval and American history at the United States Naval Academy. Before transitioning to the classroom, he accumulated over 2,500 flight hours as a Navy pilot. He completed tours of duty in engineering and acquisitions at the Naval Air Systems Command and is a past recipient of the *Samuel Eliot Morison Naval History Scholarship*; earning his PhD from the University of Maryland.

Commander Fisher writes:

> The defeat of the Japanese Navy in the Pacific came largely from the decks of the U.S. Navy's Fast Carrier Task Force. Advances in technology no doubt played a pivotal role, however, without concomitant achievements in technical education, labour methodology, and logistical innovation, victory would have been delayed, at the very least. The ability of the Navy to provide the requisite number of trained aircraft technicians and supply the U.S. Fleet with enough matériel to achieve its strategic objective was integral to its success.

Correctly, Fisher identifies that "the narrative behind the U.S. Navy's development of a large technical workforce in order to support a new era of carrier warfare is a complex history of institutional change." It was the impressive ability to change at the institutional level that became the driving force behind the U.S. War Effort – connecting, as Fisher does, institutional learning with the culture necessary to develop a Sovereign Fleet carrier knowledge base, and its supporting infotechnologies. A knowledge base and culture, based on both education and training (as the author attests) that was able to sustain U.S. carrier thinking into the 1990s – at the cutting edge of the science, and technology.

This is the quantum element contained at institutional levels; connecting the past, with the present, with the future. Something understood by actuaries but not the bloody red pens of accounts and their avaricious consultancies.

Dr Fisher leaves us with three critical questions:

1. What will the next Great Power conflict look like, and what role will naval aviation play?
2. Were America to enter into a war where aircraft attrition and combat losses were even a tenth of the World War II numbers, could it support protracted operations?
3. Have the Navy's training commands prepared, or at least considered a plan to ramp up technical education and training for a wave of airplane and helicopter technicians that would be necessary to sustain another protracted air war?

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THE NAVY LEAGUE OF AUSTRALIA
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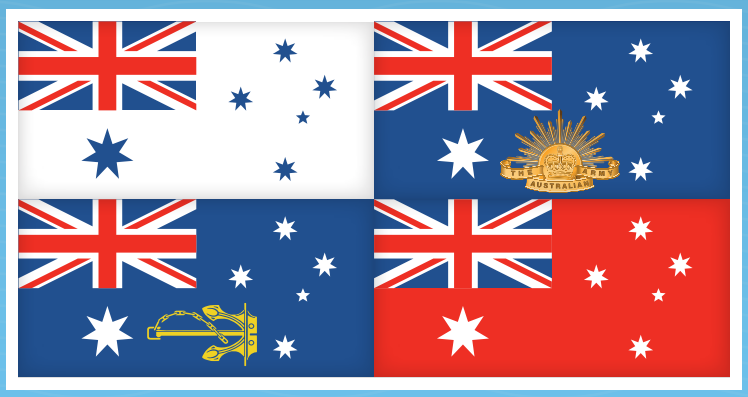

TOPICS:

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MATCH: Pakistan Navy Commissions Chinese Built Type 054AP PNS TIPPU SULTAN (FFG 263) and PNS SHAH JAHAN (FFG 264) Karachi July 2023

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