

# THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

## AUSTRALIA'S MARITIME INDUSTRY STRATEGY



**CHINA AND THE  
MAHAN TRAP**

**THE BRITISH ROYAL NAVY -  
ROAD TO SALVATION? PART I**

**SYSTEM VARIETY: COMPARING RN & USN  
ENGINEERING - PART 1**

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# THE NAVY

THE MAGAZINE OF THE NAVY LEAGUE OF AUSTRALIA

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**Front cover:** HMA Ships ADELAIDE, MELBOURNE, NEWCASTLE, PARAMATTA, GASCOYNE and HUON leave Sydney 1 December en route for Ex Ocean Raider in the Bass Strait CPOIS Phillip.

## GLOBAL WEST PUT TO THE TEST

In this issue, *The NAVY Magazine* maintains its emphasis on historic, geostrategic issues in the South China Sea through Paper 1; while Paper 2 (by Jonathan Foreman) considers the state of the Royal Navy from a leadership perspective. Jonathan was embedded with the U.S. Army's 3rd Infantry Division during the Gulf War and has written widely on Defence and Policing issues; including in the first issue of the *British Magazine Standpoint* (which he co-founded). Paper 3, by a senior UK Defence scientist and engineer, provides a detailed analysis comparing post-WWII US and RN capabilities through the lens of engineering. Its lessons are particularly relevant to RAN as Navy creates its own unique system-of-systems designs. Designs no longer held in class by its 'Parent' Navies. Paper 4 provides a useful contemporary juxtaposition by focussing on Australian Industrial Maritime Strategy (AIMS) at a pivotal moment in our maritime enterprise.

*The NAVY Magazine* continues to co-evolve with the introduction of the 'Red Duster', a historical name for the Red Ensign under which Australian Merchant Ships have sailed since 1901; British ships since 1707 (and the Act of Union); and, English ships from before the British Civil Wars (1638-1660). The Red Duster will compliment Flash Traffic and provide dedicated Merchant Marine Intel. This issue also maintains a vibrant Book Review, of particular relevance regarding the South China Sea and which provides useful additional commentary and oversight on naval matters.

War.... puts nations to the test. Just as mummies fall to pieces the moment they are exposed to the air, so war pronounces its sentence of death on those social institutions which have become ossified. [1]

We are not at war in the sense of a war posing an immediate existential threat to our sovereign borders. Yet by most stretches of the imagination, the world is not at peace. Recent global events, including in the South China Sea (perhaps like ISIS/Daesh, the SCS would better be called the South East Asia Sea (SEAS)?); on Cyber; on the UK and Brexit; and on the recent US Presidential Elections, may not have come as a shock to readers of *The NAVY Magazine*. Why? Because for at least the last decade, the analysis provided by the NLA and *The NAVY Magazine* has been prescient – frequently years ahead of anything similar appearing in the wider or specialist media. This includes on the broken-backed nature of National and Defence Research (in CSIRO, NICTA (DATA61), ANSTO, QinetiQ (the privatised elements of British Defence Research), RPDE, and DSTG), and our research universities – detailed in John Strang's two excellent papers on Australia's Future Submarine. Readers will sadly recall John's obit in the January issue.

Bernard Jenkin [UK] MP and George Grant commented, inter alia:

A decline to regional-power status is not an inevitability; it is a choice, and one based upon erroneous assumptions about the nature of the geopolitical environment in which we operate... [2]

Decline, relative or absolute is not inevitable. It is based upon choice and so upon the decision making and taking networks, organisations, politics and institutions that define us. The choice today is starker than at almost any other time, exactly because of the lack of thinking providing a vision of alternative liberal futures than the one that has characterised the West since the Great Recession, 2008-? This lack of choice, vision and credibility has found voice in so called *popularism*. At its heart, these are popular local movements calling for leadership, vision and choice, other than perceptions of the West 'as dealer in penury, mistrust and conflict'. Perceptions strengthened through *disinformation* spread on an industrial scale by the West's adversaries 'in what have been nicknamed *troll factories*: people working together in large groups constantly to push out vast amounts of disinformation via social media'. This is not the same thing at all as 'fake news' or 'alternative



Scene on board USS YORKTOWN (CV-5), shortly after she was hit by three Japanese bombs on June 4, 1942 – Photographer's Mate 2nd Class William G. Roy.

facts', claimed by all sides in the recent U.S. elections to explain their own failings of leadership, vision, and representation (of the majority), upon which successful *popular* democracies are vested.

If [America] cannot see liberty now with the clear, unerring vision she had at the outset, she has lost her title. America will have lost every claim to the leadership and respect of the nations of the world.

The long wars of Afghanistan, Iraq and the Middle East have pronounced a death sentence on many of the West's social institutions, including the UK Royal Navy. Others, such as the EU, NATO, and the UN, are all failing. Failure exacerbated by not changing – decline and growth being the hallmark of adaptive systems. One reason is ossification – a determination by institutions and organisations to maintain status quos; their power and wealth regardless. For example, by 2015 the Elite and Established Middle Classes (the Political-Professional Class) represented 25-31% of the British Population; yet by background (universities and careers) comprised 62% (and growing) of all Westminster MPs. Put simply, almost 2/3s of MPs have more in common with each other, than with 69-75% of the population they purportedly represent. The statistics are not vastly dissimilar in the US, France, Canada and Australia. Yet it is the 'ordinary folk' (the 75%?) who, in Churchill's words, 'go off to fight for [their] country when it is in trouble, go to the poll at the appropriate time, and put their cross on the ballot paper showing the candidate [they] wish to be elected...that is the foundation of democracy...they decide what government, or even in times of stress, what form of government they wish to have in their country'. They are the *popular* majority.



Franklin D Roosevelt and Winston Churchill aboard HMS PRINCE OF WALES (53) in August 1941 during the Atlantic Charter Deliberations.

In August 1941, the U.S. had yet to enter the war in the Pacific and Atlantic theatres; Russia and the British Empire were losing throughout Asia, Africa and Europe and the pivot year of 1942 – including the Battles of the Coral Sea; Midway; El Alamein; Guadalcanal; Kokoda; Stalingrad, Changsha and Operation Torch – lay in a uncertain and unforeseeable future. It was not yet the beginning of the end, or even identifiably so. Yet in August 1941, the leaders of the British Empire and the United States were able to come together and over two weeks think through policies enshrining the strategic principles of global co-adaptation. The Atlantic Charter was pivotal in establishing the bases of post WWII world order; including the United Nations; NATO; the European Union; the Commonwealth; the GATT / World Trade Organization; the IMF; and, World Bank.

There is vital Strategic Advantage in *thinking*: Deterrence can be achieved through denial of capability; technology; the capacity and depth of *thinking* and Force technology – all impacting upon Will. [4]

Events and opportunities being deployed against the 'Global West' are, by design, deliberation and circumstance, acting to disrupt critical strategic thinking. Without a strategic vision, the Global West is being driven by events, opportunities, and disinformation deployed against it. Its will, determination and capacity for innovative strategic thinking are all being broken. Western Armed Forces are demonstrably representative and necessarily reflective of society. They have structural power to influence and to lead in times of crisis – indeed it is their duty to do so. Navies, in particular, represent one of the

few Western institutions remaining where disciplined inter-socio-economic strategic thinking can be undertaken – protected, classified, and 'seen' non-conspicuously, unlike in academe, industry and politics.

What is the vision? Is there an opportunity to sculpt a 21st Century Pacific-Atlantic Charter (PAC) that will provide the vision no amount of bilateral TPPs can replace? Has Australia and Navy the courage to choose, to act and to lead?

#### REFERENCES

- 1 Karl Marx 'on War', circa 1861 writing with Frederik Engels on the US Civil War, see also Chris Donnelly on 'War in Peacetime: Coping with today's rapidly changing world' at: <http://www.statecraft.org.uk/research/war-peacetime-coping-today%E2%80%99s-rapidly-changing-world>
- 2 Jenkin, B., and G. Grant, *The Tipping Point: British National Strategy and the UK's Future World Role*. July 2011, The Henry Jackson Society
- 3 Then-Governor Woodrow Wilson speaking to a Chicago audience in 1912.
- 4 Lieutenant General H.R. McMaster U.S.A (Recently selected as the US National Security Adviser and previously Deputy Commanding General, Futures U.S. Army TRADOC), Rethinking U.S. Grand Strategy, Institute for the Study of War Security Conference, 14 September 2016.



The amphibious assault ship USS KEARSARGE (LHD-3) conducting combat missions in support of Operation Iraqi Freedom.





Official Programme of the 50th Anniversary of the Battle of the Coral Sea.

## BATTLE OF THE CORAL SEA — NOT QUITE FORGOTTEN

For many years after World War II the Battle of the Coral Sea was widely celebrated in Australia. On or about the 6th May each year there would be visits by USN ships, marches through our capital cities of Australian and United States navy personnel and many civic functions. The Battle of the Coral Sea was considered to be a significant event in Australian history. As readers of this magazine will know, the battle was important in the development of naval warfare. It was important as the Allies first victory in the Pacific. It was important too for Australia in the development of the Australia-United States Alliance. In 1992, on the occasion of the 50th anniversary, elaborate arrangements were made to celebrate the battle. A Commemorative Council was established with Prime Minister Keating and US Ambassador Sembler as Patrons. The Council itself was comprised of some 50 notable Australians. The Official Souvenir Publication, setting out the programme of events, runs to 100 pages. It covers the many activities which took place the length and breadth of Australia.

How times have changed. In May last year I wrote to the Prime Minister. I wrote again in November. While the particular proposal I wrote about may have been overtaken by events, the lack of response, together with (at the time of writing) no other sign of activity, suggests that unlike 1992 there is no Government interest in commemorating the Battle of the Coral Sea. The Navy has no plan for Coral Sea commemorations.

The Navy in 2017 is committed to a substantial programme of other commemorations. 2017, it must be remembered, is also the 75th anniversary of other important events in the history of Australia and the Royal Australian Navy. To quote the Sea Power Centre, 1942 was "the Royal Australian Navy's darkest year". HMA ships PERTH, YARRA, VOYAGER, ARMIDALE, VAMPIRE, KUTTABUL and CANBERRA were lost. This will be the focus of Navy's commemorations.

It is clear that the 75th anniversary of the Battle of the Coral Sea will not be recognised in the same way, or on the same scale as the 50th anniversary. Nevertheless, the annual commemorations that take place each year around Australia will again occur. The Navy will no doubt be represented at many of these events. Organisations like the Australian-American Association will be of course be recognizing the occasion. The Navy League in various places will be supporting anniversary activities. Among the many naval commemorations to take place in 2017 the Battle of the Coral Sea will not be forgotten.

## THE ST AYLES-KERNIC PROJECT — PUTTING SOMETHING BACK

In 1983, following celebrations to mark the 30th anniversary of the formation of TS Creswell, the first Perth metropolitan Navy League Sea Cadet unit in Western Australia, a group of former cadets got together and all agreed that they had such a good time as cadets that they ought to put something back into the Naval Cadet unit. This sentiment led to the formation of the Ex Naval Cadets Association. In a short time regular meetings of the former cadets were held. Fund-raising was commenced. To start raffles were conducted. Funds were accumulated slowly and the group let it be known among Cadet Units that the Ex Naval Cadet Association

(later to become the Naval Cadets Association Inc.) was available to assist them.

Fundraising ventures progressed, including sorting and selling wool discarded from wool sales, selling hot dogs at HMAS STIRLING open days and conducting Balls, including Debutante Balls. Funds gradually accumulated and requests came in from cadet units which needed to purchase gear that was essential for training cadets. Over a period of 33 years the Naval Cadet Association provided (in 2015 dollars) \$100,000 to Naval Cadet Units throughout Western Australia.

In 2015 the members of the Naval Cadet Association decided that it was time to wind up the Association. The former Navy League Sea Cadets were not getting any younger. A considerable amount of money had been accumulated and the question arose as to what to do with it. At the time there was no longer a boat in the Navy cadet fleet for cadets to row (pull). It was decided that the Association would use its funds to provide pulling boats. It was suggested that St Ayles rowing skiffs be built. These boats are 6.7 metres long. After canvassing country cadet units it was realized that the St Ayles boats would be too long to fit under cover at most units. It was decided that two St Ayles skiffs would be built for the use of the six metropolitan cadet units. Given that it would be impractical for the country units to share the skiffs it was decided to build a craft suitable for the country units at Esperance, Albany, Geraldton and Port Hedland.

The choice was made to provide the four country units with a Vivier designed Kernic boat. The Kernic boat, 5.7 meters in length, was a design of French naval architect Francois Vivier. A local boat builder at Rockingham obtained the licence to build the boats. He had equipment to cut out the timber using a computer programme generated in France. He was commissioned to build four Kernic boat shells. Members of the Naval



St Ayles Skiff Awaiting for Launch.

Cadet Association undertook the filling, filleting and painting under his supervision. Meantime at Mandurah a Naval Cadet Association member and fellow wooden boat enthusiast undertook, with assistance from their sailing companions, to build the St Ayles skiffs.

Both the St Ayles and the Kernic builds progressed well. The first St Ayles skiff was presented to ANC HQ at Leeuwin Barracks on April 16 2016. The first Kernic underwent sea trials at Rockingham on April 18. This boat was presented to TS Pilbara on 4th July 2016. By the end of 2016 the boat building programme was complete. All six boats had been presented to the Cadets.

Readers have only to look at the wonderful pictures of the boats to appreciate what the former Navy League Sea Cadets have achieved. Congratulations to everyone involved in "putting back". BZ.



The final boat made for TS MORROW  
Australian Navy Cadets in Geraldton WA.

## LETTERS

### British Commonwealth Occupation Force

Dear Editor,

The light cruiser HMAS HOBART (Captain D. A. Harries RAN) was assigned to the British Commonwealth Occupation Force (BCOF) in Japan for about 9 months in 1947, while I was serving in her as a Signaller. I recall a short period when she was withdrawn from BCOF and diverted to support British interests as guard ship in Shanghai, where she moored in Wang Poo Creek. Captain Harries was designated Senior Officer Force "T" and thus for the period was responsible for the operation of all Allied naval assets in the region. This would have been an important early development in the history of RAN participation on the China Station during the post-WW2 period.

Thank you for another excellent issue of *The NAVY*.

Harry Josephs

### Reference *The NAVY Magazine* Vol. 79, No. 1: pp 5, 14, 21

Dear Sir,

I must say that I am most upset with the seemingly lack of editing in your magazine, issue Jan-Mar 2017, Vol. 79, No. 1:

Page 05 Figure 1, Picture showing HMAS BRISBANE (D39). Perhaps should read HMAS HOBART?

Page 14, Figure 5, clearly an ANZAC class FFH at Henderson in Western Australia; not South Australia.

Page 21, article on CSG 5 returning to Yokosuka, clearly there can't be two DDG 54s in the US Navy?

Signed J 'Gunns' Harris

### Reply: It is not the critic that counts

Thank you, you are right in all respects and the Editorial Board stands corrected as detailed above:

USS BARRY pennant number should read DDG 52 and USS CURTIS WILBUR is correctly indicated as being DDG 54.

President Teddy Roosevelt observed:

It is not the critic who counts, not the man who points out how the strong man stumbled, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena; whose face is marred by dust and sweat and blood; who strives valiantly; who errs and comes short again and again; who knows the great enthusiasms, the great devotions, and spends himself in a worthy cause; who, at the best, knows in the end the triumph of high achievement; and who, at worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who know neither victory nor defeat.

The NLA and *The NAVY Magazine* welcomes membership. It is noted that J 'Gunns' Harris may not be a member and might be ex-Navy? The NLA would very much welcome Mr Harris into the arena as a Member and potential contributor of articles and images to *The NAVY Magazine*. It is very good value for money!

### Reference Flash Traffic, *The NAVY Magazine* Vol. 79, No. 1, pp 18-19

Dear Editor,

I was disappointed in the rather downbeat review in Flash Traffic on the 75th anniversary commemoration of the RNZN. While the Kaikoura earthquake and bad weather certainly had consequences for some of the events planned, I felt the Navy rose to the challenge and still managed to run a successful event. I was one of the thousands of Kiwis who attended the Ships Open Day on Sunday 20 November. The weather was kind and the Auckland Waterfront hummed as people waited in line to visit the RNZN and international warships open for the day. The only protesters I saw were a small group on Queens Wharf protesting the presence of the Indonesian LPD KRI BANDA ACEH berthed nearby. I came away with the view that our Navy is respected and the nation is grateful that the RNZN, supported by RAN, RCN and USN warships, was able to quickly respond to a local natural disaster and provide humanitarian relief.

NLA Member, New Zealand



## Comment

Dear Sir,

This was a magnificent occasion exactly because the Kiwis did attend – however, the opposition faced specifically by [a Senior RNZN Officer] was significant, and he should be congratulated for his courage and perseverance ‘above and beyond’. The quotes were taken directly from news coverage and reflect your own views (Re. the lack of protesters), that these local papers dwelt on – rather than the event itself, what it was commemorating, or the RNZN. The New Zealand Herald is a direct quote. RNZN 75 got front and back pages and four other photos - including the one of [the British RN's] First Sea Lord, oh and a full page spread...[Few] other magazines in NZ or elsewhere provided similar coverage...; [noting] the NLA was not officially invited, hosted or offered even a press pass...

Recognising that ‘there is no such thing as bad news...’, the coverage...and the accuracy of the commentary provided – as reflected by your own observations – and the recognition of the magnificent HADR effort [supported] by the RNZN, USN, RCN and RAN (in Flash Traffic and in the President's Page), I think RNZN did rather well. The final paragraph in Flash Traffic perhaps says it all:

[...the RNZN did mark the day; ships gathered and those present remembered the wonderful, brave NZ Sailors and Servicemen and women, from all walks of life and ethnicities, who withstood Hitler's onslaught in the Mediterranean and North Africa and those who fought in Korea and Vietnam (and Iraq and Afghanistan) and who maintain the Golden Thread of Navy, from King Alfred the Great, to today. ‘We will remember them’, even if the elite political classes, media talking-heads and closet-activists may not.]

*Aeneas for Editorial Board.*

### No Significant 75th Anniversary of the Battle of the Coral Sea

Dear Sir,

At the Annual Meeting of the League the President reported that he had written to Chief of Navy to see what Navy intended to do to celebrate the 75th anniversary of the Battle of the Coral Sea. In response he had been contacted by Navy Events. They had nothing planned for Coral Sea 75. Navy Events emphasised that they are committed to commemorating the 7 ships lost in 1942. The President understood Navy Events may offer support to Coral Sea events organised by others,

but not to initiate anything. The principal focus of Navy will be to commemorate the ships lost.

It appears that commemorating losses has priority over celebrating victories.

NLA

**Flag Memo:** ...[this seems such a strategic wasted] opportunity [following the inauguration of the new President] for the Navy to put itself before the public in a big way, noting that the battle was arguably the most important one for [Australia] in the whole of WW2; that some 2000 RAN personnel and our remaining 2 cruisers, coast watchers and code breakers as well as some RAAF aircraft took part; that there could not have been a New Guinea campaign if we had lost control of the Coral Sea; that had the battle gone the other way Midway may never have taken place or the US carriers would have had only 2 against maybe 6 Japanese carriers; and that the East Coast of Australia would have been wide open to attack by the Japanese fleet had they so desired.

## IN THE NEWS



### National Treasure

The Australian National Maritime Museum announced that it's Council has honoured one of its most valued supporters, Rear Admiral Andrew Robertson by naming him as its inaugural Honorary Fellow in recognition of his thirty years of service and support of the museum.

Rear Admiral Andrew Robertson AO, DSC, RAN (Rtd) (Federal Vice President of the Navy League of Australia) being presented with his honorary fellowship by museum councillor / Fleet Commander, Rear Admiral Stuart Mayer AO CSC and Bar, RAN.



### Perpetual Trophy

Each year the Navy League of Australia awards a Perpetual Trophy to a ship or establishment which has made an outstanding contribution to the community during the year.

The award for 2016 was recently presented to HMAS DARWIN (FFG 04) by Mr John Jeremy AM, Senior Vice President of the League, in the presence of the Commander Australian Fleet, Rear Admiral Stuart Mayer AO CSC and Bar, RAN. The award was accepted by Lieutenant Clair McIntosh RAN and Leading Seaman Combat Systems Operator James Gibson RAN of HMAS DARWIN.



### Keeping Watch

Vice Chief of Defence Force, Vice Admiral James 'Ray' Griggs, AO, CSC (Life Member of the NLA) being presented with his copy of Keeping Watch by Mr Mark Schweikert (NLA Federal Vice-President).

**Copies of *Keeping Watch* can be ordered from The Navy League of Australia, NSW Division.**

**Simply download the order form from the League's website  
~ [www.navyleague.org.au](http://www.navyleague.org.au).**





# CHINA AND THE MAHAN TRAP

By Kevin Beard

**The Royal Australian Navy (RAN) was created in a period of strategic tension between Britain and Imperial Germany prior to the First World War. Their arms race to build a dominant fleet of battleships hastened the emergence of the RAN and found Australia prepared for the maritime challenges of 1914. As Australia celebrates the centenary of the First World War we face an international strategic risk more akin to that pre-war period than at any time since 1945. This essay places the present South China Seas dispute in the context of that pre-war period.**

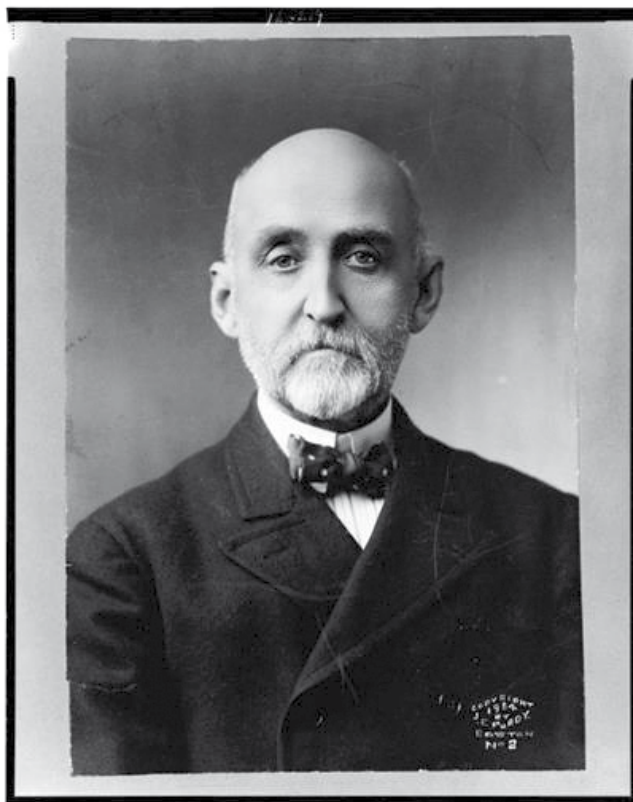
## CHINA AND THUCYDIDES' TRAP

Thucydides, the ancient Greek statesman and historian, wrote of an entanglement where an emerging great sea power, Athens, would strike fear into then violently clash with the pre-existing great land power of the age, Sparta. During his lifetime in the 5th century BC he published a history describing their conflict in the Peloponnesian Wars.[1] This true Greek tragedy parallels the entrapment before the First World War between the global British Empire and the rising Imperial Germany caused in part by their maritime arms race. In the 21st century, a similar great power rivalry is confronting the United States in the South China Sea. This modern maritime dispute necessitates a prominence and reliance on the present day RAN by Australians to an even greater extent than its illustrious efforts of the century past.

## UNCLOS ARBITRATION

The Permanent Court of Arbitration in The Hague issued a ruling on 12 July 2016, at the request of the Philippines' government, on the interpretation of territorial rights in the South China Sea under the United Nations Convention on the Law of the Sea (UNCLOS).[2] This ruling favoured the Philippines but is disputed by China. China claims control of sea rocks and reefs far from their shores to the extent of establishing military bases on reclaimed reefs within a declared "traditional" territory behind a "Nine Dash Line". Effectively, China is adopting the United States' 19th century maritime strategy of Mahan and the Monroe Doctrine and re-applying them to China's present maritime situation.[3] United States (US) President James Monroe's principles of European non-intervention in newly independent Latin

America was initiated to prevent Spain and France reasserting colonial power over their former colonies with which the US wished to trade. China's modern assertion sets the scene for a superpower conflict between them and the US, the latter in support of the ASEAN countries in the South China Sea, and Japan and South Korea in the East China Sea to the north. In the context of Thucydides' trap, the present great power is the US which is being challenged by the emergent superpower, China.[4]



Alfred Thayer Mahan (Library of Congress 98501038).

## CAPTAIN MAHAN

Who then was Mahan? Captain Alfred Thayer Mahan was an officer of the United States Navy, a lecturer in naval history, and later President of the United States Naval War College. Between 1890 and 1892 he published two works on the influence of sea power on history, the first on the period 1660-1783, [5] and the second on the French Revolution and Empire to 1812. [6] These books provided a very influential and productive impact on the strategy and development of the United States Navy. In the briefest of terms, the books endorse naval power as the basis for global military and colonial power, strategic concentration of forces to destroy the enemy and their commerce,[7] and of seaborne commerce as a determinant of success in war.

As a consequence Mahan's works became exceedingly popular with Kaiser Wilhelm II, his naval strategist Admiral Alfred von Tirpitz and German aristocrats sharing a zeal for expanding their colonial empire. Admiral Tirpitz was appointed Secretary of State of the Imperial Naval Office in 1897 and, in line with Kaiser Wilhelm's aspirations to compete with the British Empire, Tirpitz began to build a fleet to challenge the century long ascendancy of the Royal Navy (RN).

To ensure Britain's security the RN operated on a strategy of dominance and deterrence, its fleet built to a size larger than its next two largest rivals combined.[8] Consequently an expansion of the Kaiserliche Marine (German Imperial Navy) threatened that margin of security and inevitably lead to an arms race as the British and Germans attempted to outbuild the other. In 1906 the British commissioned HMS DREADNOUGHT. As the first modern battleship, it was a breakthrough design featuring ten 12 inch (30.5 centimetre) guns, extensive armour yet could still travel at 21 knots due to its innovative steam turbines.[9] This led to all the major navies of the world entering the arms race and building their own dreadnoughts.

## FIRST RAN FLEET

The dreadnought arms race had its impact on Australia and New Zealand. In 1907 New Zealand had become an independent dominion within the British Empire. In 1909 the New Zealand Government offered to provide the RN what was commissioned in 1912 as a battle cruiser of the Indefatigable class for a cost of £1,706,000 and christened HMS NEW ZEALAND. Ultimately the RN would deploy HMS NEW ZEALAND in its Battle Cruiser Fleet in the North Sea under Vice Admiral Sir David Beatty, participating in the battles of Dogger Bank and Jutland.[10]

Six years earlier, in 1901, the Commonwealth of Australia came into being with self-defence widely perceived as an important national priority. In the following year the Anglo-Japanese Alliance came into effect with the Imperial Japanese Navy assisting the RN in the Pacific Ocean to balance the threat of the Kaiserliche Marine.[11] Whilst an effective strategy for the British, this unnerved the Australian government who sought the creation of a national navy. In the meantime, American President Teddy Roosevelt's Great White Fleet was invited to visit Sydney in August 1908, in an improperly independent act of foreign policy by a dominion of the British Empire. The United States Navy fleet visit was intended to hurry up Westminster for the arrival of the new Australian warships as well as build a relationship with the Americans.

On 10 July 1911 King George V formally approved the creation of the RAN. Just two years later, on 4 October 1913 the battlecruiser HMAS AUSTRALIA, the cruisers MELBOURNE, SYDNEY, and ENCOUNTER, and the destroyers WARREGO, PARRAMATTA and YARRA entered Sydney Harbour and Admiral Sir George King-Hall RN handed command of the Australian station to the RAN. Unlike the primarily militia manned Army, they operated as full time professionals of His Majesty's Australian Fleet.[12]



President Teddy Roosevelt's American Fleet passing Bradley's Head in 1908 (Australian War Memorial P05245.002).



1910 Kaiser Wilhelm II (left), Admiral von Tirpitz (facing camera) and Admiral von Holtzendorff (Library of Congress 93070).

## ASSASSINATION AND WAR

In less than a year, on 28 June 1914 in Sarajevo, the Austrian Arch-Duke Ferdinand was assassinated by a Serbian terrorist. On the following 6 July Kaiser Wilhelm and his Chancellor, Theobald Bethmann-Hollweg, telegraphed the Austro-Hungarian Foreign Minister Berchtoldt to write (in part):

The Emperor Francis Joseph may, however, rest assured that His Majesty will faithfully stand by Austria-Hungary, as is required by the obligations of his alliance and of his ancient friendship.[13]

This telegram is known widely by historians as the "blank cheque" facilitating the Austro-Hungary attack on Serbia in retribution for the assassination. A few weeks thereafter, the Austro-Hungarian Empire declared war on Serbia on 28 July 1914.



On 3 August 1914 Germany began the invasion of Belgium as the start of its sole war plan, the Schlieffen Plan. An alternative "Eastern Deployment Plan" to deal with Russia only was abandoned in 1913. The Kaiser's belated suggestion on 1 August 1914 to "turn the army to the east" to fight Russia was immediately repudiated by Army Chief of Staff General Moltke despite it being feasible, later attested by General Groener (commander of the Railways Section). Imperial Germany contemptuously discarded the moral high ground concerning the assassination of a future head of state by terrorists and invited international diplomatic condemnation for their invasion of neutral Belgium. In the attack directed at France, Germany had promptly turned their back on their Austro-Hungary alliance and on their Czarist Russian enemy bringing Belgium into the war then Britain the following day.[14] Thus Germany's strategy brought them into conflict with Britain in a war conceived in Eastern European continental politics and terrorism. How well did the Schlieffen Plan go?

As a military imperative two German Army Corps were removed from the Schlieffen Plan operations and transported east to face the Russians at Tannenburg. Two effective fully professional corps were provided by the British Expeditionary Force, plus the resistance of the Belgian Army. In addition to the anticipated French Army, these unforeseen events demolished the Schlieffen Plan. Between Liege and the Marne River, by 9 September 1914, these factors combined to create stalemate on the Western Front.[15] As for the Kaiserliche Marine, they had no plan for the outbreak of war other than the commerce raiders adored by the Kaiser and rejected by Mahan.[16]

## THE GERMAN COLONIES FALL

So how did Germany's colonies fare on the outbreak of war? At the outset in August 1914 British West African and French colonial troops invaded Togoland. By 26 August the Germans in Togoland had surrendered. On 29 August the New Zealanders captured German Samoa. In September HMAS MELBOURNE was sent in to destroy the German wireless station on Nauru. On 17 September German New Guinea was surrendered to the RAN Squadron. 23,000 Japanese supported by 1,500 British soldiers captured the German colony of Tsingtao in China on 7 November.[17] On 9 November 1914 HMAS SYDNEY famously sank the raider SMS EMDEN. A measure of Germany's difficulties was that the EMDEN was also being hunted by RN cruisers YARMOUTH and HAMPSHIRE, the French DUPLEIX and the Japanese CHIKUMA.[18]

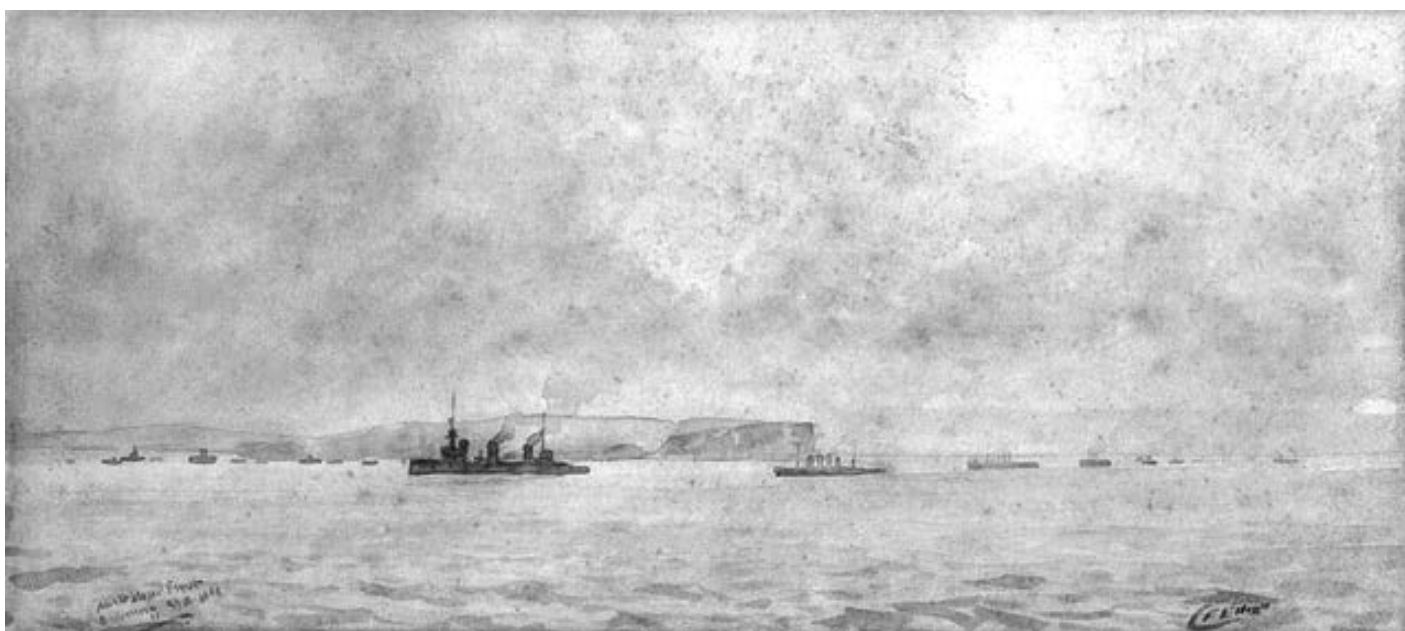
In 1915 after some initial success, the German forces in German South West Africa surrendered to South African troops on 9 July. British, French and Belgian units invaded the German colony of Cameroon from August 1914 finally succeeding in its capture on 18 February 1916. Whilst the famous jungle fighter Colonel Paul von Lettow-Vorbeck did not surrender to the British forces until 25 November 1918, he was cut off from Germany for the entire war. His forces lost control of German East Africa (Tanzania) when it was invaded in a second attempt by South African and Indian forces in 1916. In 1917 von Lettow-Vorbeck was cornered in Portuguese East Africa (Mozambique).[19]

Though disastrous for Imperial Germany, all of the colonial defeats are completely consistent with Mahan's theories. In the absence of a freely navigating German Navy which, with the exception of submarines and a few raiders was at anchor between Wilhelmshaven and Kiel, the German colonies were indefensible and so fell one after the other.

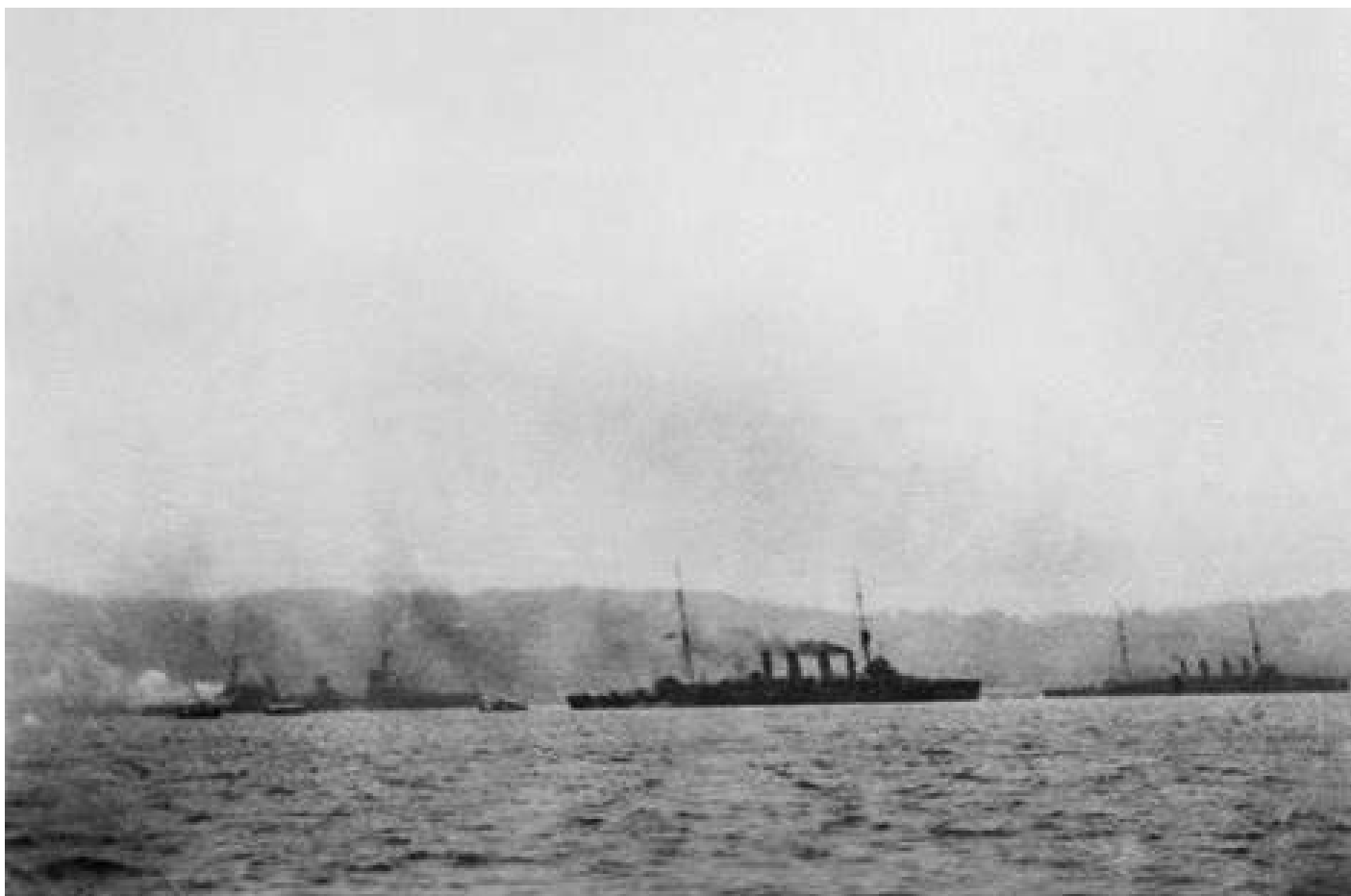
## GERMAN STRATEGIC ERROR

What had gone wrong with Tirpitz's grand strategy? Was it because the German High Seas Fleet failed to defeat the British Grand Fleet or had Germany already lost the dreadnought race before 1914? In reality neither the Kaiserliche Marine nor German industry could ever have attempted to defeat or dominate the combination of the double sized RN and the French Navy and the Russian Navy and the Japanese Navy, and after later declarations of war, the Italian and the United States navies. Critically, Imperial Germany was a continental rather than a maritime power. The investment of Reichsmarks, steel, labour and engineering that went into German dreadnought production was squandered. The battles of Jutland, Dogger Bank and a few raids excepted, the High Seas Fleet sat idle in port having no strategic or tactical impact on the First World War.

What is most remarkable is that Germans had invented the automobile (Benz 1886), the petrol engine (Otto 1876), and engineering firm MAN had bought Frenchman Rudolf Diesel's patents in 1893! Why did continental Germany not invest in armoured vehicles instead of armoured dreadnoughts? This is not counterfactual. As early as 1908 armoured cars participated in German military manoeuvres. In 1911 an Austrian officer, Oberleutnant (Lieutenant) Burstyn, proposed a tracked machine gun carrying vehicle to the Prussian War Ministry. Burstyn patented the vehicle in Germany in 1912.[20] In July 1912



Australian fleet entering Sydney Harbour, watercolour by Frederick Elliot (Australian War Memorial ART93392).



HMAS AUSTRALIA (left) firing a salute on the raising of the British flag at Rabaul Harbour 1914 with HMAS SYDNEY (centre) and HMAS Melbourne (right) (Australian War Memorial A01586).

an Australian, Lancelot Edin de Mole, proposed a tracked vehicle to the War Office in London.[21] Neither the German nor the British governments pursued these early tank proposals prior to the outbreak of war.

Had a quantity of armoured vehicles been manufactured prior to 1914, Germany might well have reinforced Austria-Hungary and simultaneously confronted the Russians without depriving the “Schlieffen” operation of its necessary resources. On the Western Front in 1914 the Germans may have, with armoured vehicles, achieved Schlieffen and Moltke’s desired quick victory. Ultimately, the Allies defeated the German Army with massed tanks at the battles of Second Marne, 18 July 1918, and Amien, 8 August 1918.[22]

## THE MAHAN TRAP

So Imperial Germany’s failure was not a lack of ship building capacity nor the failure to seek a naval victory but of embracing, what was for them, a totally dysfunctional strategy. This is what I call the “Mahan Trap”. It was the investment of the Kaiser and his staff, driven by greed for colonies and envy of the British Empire, into a strategy that was simply self-destructive. Imperial Germany’s 1914 aggression was unsustainable without winning military dominance either at sea (highly improbable) or on the European continent (plausible), where it could bargain back lost colonies with its European conquests.

Had understanding of Mahan by German leadership superseded infatuation, Germany would have avoided any conflict with Britain, especially not invading Belgium. A less menacing maritime strategy to Britain, of fast cruisers smaller than dreadnoughts and fast merchant liners, might have protected the distant German colonies against the French and Russian Navies. By not provoking Britain’s war entry and

avoiding conflict with the RN, Germany’s food and industrial imports could have been secured. The economic blockade that starved their civilian population could have been avoided. Moreover, United States exports could have reached wartime Germany making it an equal business proposition to that of the Allies and thus discourage US entry to the war for financial and domestic political reasons.

So we can define the “Mahan Trap” as the adoption of a seductive but misconceived and self-defeating strategy. Which brings us back to the present question: is China stuck in a “Mahan Trap”?

## CHINESE STRATEGY

China’s actions in the East China Sea against Japan and in the South China Sea are exceedingly aggressive as is its government rhetoric. China’s strategy seems to be an emulation of Mahan’s maritime strategy and the territorial Monroe Doctrine of the 19th century United States.[23] These strategies have been misconceived by China so running as real a risk of escalation to war as that which occurred in Europe in 1914, and for much the same underlying reasons.

So what would maritime conflict achieve for China? Even putting aside a devastating nuclear war, a conflict would likely cut the Chinese economy off from its main markets and suppliers resulting in economic downturn and internal instability. China’s main markets include the United States and Japan and main suppliers include Australia. War would harm all the East Asian economies, impede their economic growth and in turn impede the economic growth the East Asian markets would have reciprocated in China.

And what of China’s assumed nemesis, Thucydides’ modern superpower? The United States has the same interests in economic



growth, commerce and safe passage of trade in the Indian and Pacific Oceans and the East and South China Seas as does China, the ASEAN countries, Japan, Australia and India. Like Imperial Germany China's principal threats are land bound, to the north, south and west. Maritime cooperation is a far more enriching national strategy for China than challenging the United States for supremacy. This is not an argument to say that there are mutual benefits or common interests in avoiding conflict. It is to assert that China, like the deposed Kaiser Wilhelm II, has adopted an inappropriate misconceived strategy far more likely to entrap it and trigger a self-defeating conflict than produce a self-beneficial outcome.

## CONCLUSION

It's not the Thucydides' trap that endangers us. The United States and Britain worked in cooperation and peace when the US surpassed Britain. The risk is that misconceived strategy could entrap the protagonists and trigger a violent competition for superpower supremacy. The seduction of power enthralled Kaiser Wilhelm and Tirpitz launching Imperial Germany into a humiliating defeat during the First World War. China may unwittingly repeat this history. For Australia the conclusion, as in 1913, is that a strong naval capability is essential to both the prevention of catastrophe or as a response to its consequences.

However, if China eludes this "Mahan Trap", an alternate future of regional peace and stability can prevail. Then China, the ASEAN nations, Japan, Korea, Australia and the United States may find that the axis of world commerce for the 21st century shifts from the Atlantic to the Pacific. East Asia and North America will become a dual reciprocating economic engine, and trade the world economy back to good health. Or, through China's misconceptions and subsequent miscalculations, Australia may discover on its doorstep a devastating conflict against a dragon with a long memory. ■



Oberleutnant Gunther Burstyn, 1906 (Austrian Academy of Science).

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# THE BRITISH ROYAL NAVY – ROAD TO SALVATION? PART I

By Jonathan Foreman

**This paper proposes in essence that the Royal Navy cannot be saved in its current form, that the problems described in previous articles in *The NAVY Magazine* (see e.g. Morant (2006) Vol. 68, No. 2, pp. 3-7) and frequently noted in recent years by other, often non-British, publications [1], are likely to be terminal. Given that the RN is already little better than a token force [2], manifestly unable to carry out many of the missions expected of it in home waters as well as distant seas [3], and that UK decision makers are unwilling to face up to the decisions and obligations required of a major maritime power, the best that Great Britain can hope for may be to field a moderately capable North Sea flotilla as part of a combined UK Defence Force.**

## INTRODUCTION

While noting the ramifications of the Fleet's transformational shrinkage since the 1982 Falklands war (the RN currently has just 6 destroyers, 13 frigates, seven attack submarines and no fixed wing aircraft; in the 80s it had 36 frigates, 13 destroyers and two small but effective aircraft carriers) such as the fact that it lacks sufficient ships to meet all its standing patrol tasks [4], this paper argues that even if the RN somehow, through some magical process, were to instantly receive sufficient numbers of modern ships, weapon systems and aircraft to carry its assigned tasks effectively and safely, it would not be able to do so.

This is not simply because the RN now lacks the trained manpower to crew its remaining ships and has no realistic chance of bringing back the experienced personnel it discarded after 2010 or recruiting suitable replacements. It is also because decades of external and internal assaults have done profound damage to the Navy's core culture. A unique and much-admired institutional ethos formed over and by the centuries, one that that informed and inspired generations of officers and men, has been corrupted and hollowed out over a remarkably short period of time.

Institutional cultures are amorphous, subtle things that can be resistant to quantification and empirical study, but there are all too many near-probative manifestations of a profound, negative change in that of the Royal Navy.

## THE ROOTS OF THE CRISIS

It's a cultural change that involves and is fostered by defects in leadership. For it is leadership failures that lie at the heart of a succession of RN defeats both institutional and international, suffered at the hands of a variety of enemies ranging from the Iranian Navy to the UK Treasury and the RAF.

The most prominent of these manifestations of cultural decline are the HMS CORNWALL (F99) humiliation in the Gulf in 2007 (and, equally telling, the RN's response to the debacle), and the extraordinary increase in the rate of major warship accidents from the late 1990s onwards. But there are plenty of other, less dramatic or less publicized indications that a

leadership culture that famously prized personal responsibility, initiative, and daring, and simply presumed qualities like patriotism, loyalty to the service and physical and moral courage, does so no longer.

Failures of leadership that would from the 1780s through the 1980s have been seen as manifestations of cowardice and rank incompetence have become so frequent as to be almost routine – as has an institutional instinct to treat successive disasters and humiliations as mere public relations problems to be spun or massaged, rather than opportunities for self-examination and improvement.

This leadership crisis within the Royal Navy has not only contributed to internal demoralization and the collapse of recruitment, it has also rendered the service incapable of defending itself politically against ruinous procurement decisions, crippling and ill-thought out cuts, and the longstanding, irresponsible but sadly successful efforts of the RAF to eliminate the Fleet Air Arm.

It is probably not coincidental that this leadership crisis has coincided



21 May 1982, British forces begin landing from HMS INTREPID (L11) at San Carlos in the Falklands. Failures of leadership from the 1990s would have been seen as manifestations of cowardice and rank incompetence.



with the development of a much-remarked [5], quasi-comical, Austro-Hungarian top heaviness in the service, with the RN now boasting more than twice as many admirals as fighting ships and at least 13 captains for each frigate and destroyer 'on the water'.

But more genuinely troubling than the Royal Navy's apparent surfeit of gold-braid, is the fact that so few in this large pool of under-employed senior officers have the knowledge, experience and in particular the practical engineering skills the Navy actually needs. One of the reasons why the RN's (deeply problematic) new ship classes are invariably delayed by many years is that the RN long ago lost the last [set of experienced and knowledgeable] officers who had taken new submarines and carriers from blueprint to launch.

As one of several such officers [and senior / junior ratings, including Royal Marines] who emigrated to Australia (much to the benefit of the RAN) told me on reading about the RN's most recent reported fiasco, namely the failed test launch of a Trident D5 missile [6] from HMS VENGEANCE (S31),

'[they] no longer know how to design, engineer, build or crew ships, let alone lead a Navy'.

Note 1: for more detail on RN engineering, see Paper 3 in this issue by *Thunderer* entitled 'System Variety: Comparing RN & USN Engineering – Taking the Long View', Part I

## BEING ECONOMICAL WITH TRUTH AND CULTURE

Increasingly it is only the British Army and Royal Marines that are rated by the UK's closest military allies. All too often the other two services increasingly resemble public sector bureaucracies like the NHS only with less money and public support. That said, all of the British armed services are increasingly infected with an unsuitable management ethos that draws its language and concepts from the fields of management consultancy and branding. It is unsuitable because it is indifferent or even hostile to traditional military virtues like loyalty, duty and patriotism. (One of the depressing hallmarks of contemporary military culture in all three services is the willingness of senior officers to betray the interests of their service, their men, and arguably the strategic interests of their country, in pursuit of post-career patronage and rewards like peerages and board seats.)

It does not help that, as *Standpoint* magazine described in 'Unfit for Purpose' [7] in 2008, the British Ministry of Defence is now a civilianized, demoralized organization dominated by generalist civil servants who tend to lack not just military experience and technical knowledge but also sympathy with the mission and purpose of the armed forces.

Sadly this is only one source of a profound crisis in morale affecting the British armed services. Others include the inept cuts and procurement decisions made by successive government defence reviews (the worst being those of the Conservative Governments led by John Major and David Cameron [8]). There is also the official disdain for history and tradition demonstrated by the disposal or sale of landmark properties like Greenwich Royal Naval College and Admiralty Arch (it's impossible to imagine the US Navy selling off Annapolis to

make a quick buck for the Department of Defense). But the precipitate decline in morale probably has more to do with the appalling conditions and pay for enlisted personnel that top brass have done so little to improve, the shameful failure of the UK to provide proper care for its wounded veterans [9] and their families, and also with the astonishing UK government support for dubious legal prosecutions of current and former servicemen. Unfortunately, the implications of collapsing morale seem to be as ill-understood or appreciated by Michael Fallon, the UK's current Defence Minister, as his predecessors.

There is little consolation in the disturbing indications that the US Navy may be suffering from some analogous afflictions. This is suggested by the catastrophically expensive, ill-conceived and mismanaged development of the Littoral Combat Ship (LCS) (apparently doomed to be the world's costliest coast-guard cutters) the problems affecting the ZUMWALT (DDG 1000) destroyer, and above all in the recent Cornwall-like episode [10] in which two USN riverine boats and their crews were seized by Iranian Revolutionary Guard Corps. On the other hand, unlike the RN the USN quickly and thoroughly investigated and responded to the incident without any attempt to whitewash command at any level [11].)

## WHAT CORNWALL REVEALED

It is worth revisiting the HMS CORNWALL incident in the Gulf in 2007, not simply because the Royal Navy was defeated in its only serious encounter with a hostile naval force since the Falklands war, but because there is little indication that the RN leadership problems it demonstrated have been confronted let alone solved. It was typical of the almost sleazy way the affair was handled by the RN that the captain of the CORNWALL was quietly fired [12] a year after the event rather than questioned in a court martial that might have shone a useful light on systemic reasons for the debacle.

Despite efforts by the Royal Navy to massage or even cover up the details of the incident, rumours swept the defence community at the time that the real reason why the CORNWALL's Lynx helicopter was neither in the area nor armed as it should have been, was because it had spent the day flying around a television crew, one that was doing a story about the RN's successful gender policies. (It was also widely said that the presence of a female sailor in the boarding party influenced the decision to not even threaten armed resistance to the Iranians).

While the humiliation in the Gulf was depressing enough, the reaction at



Captured British RN personnel from HMS CORNWALL (F99) looking more like a bunch of students on a field-trip than sailors-under-arms following their tutorial with the then Iranian President Ahmadinejad in April 2007. Image AP

home was if anything even more alarming. Perhaps the most surprising and dismaying reaction came from Sir Alan West, a hero of the Falklands war and former First Sea Lord. West ardently justified the instant surrender by the British sailors and marines, saying that 'the RN's rules of engagement' which forbade them from opening fire unless fired upon, 'required them not to offer or threaten any resistance to their capture'. (By the same logic, if the Iranian patrol boats had surrounded the CORNWALL itself, its captain would have been bound to surrender the ship.)

West and others were arguably so quick to defend the ROE and so eager to paint a decision that led to global humiliation as wise and inevitable, that they failed to consider that it was extremely unlikely that the Iranians would have dared gun down the RN boarding party. After all, doing so would risk starting a war with a US-led coalition of which the RN vessel was a part, and the commander of the IRGC boats would certainly have been aware of the presence of a USN carrier battle group just a short flying distance away by F/A 18. It would only have been a matter of hours after the (unlikely) massacre of an RN boarding party before all the IRG's boats were afire or at the bottom of the Gulf.

In the Nelsonian Navy, that is to say the Royal Navy until at least the Falklands War and the early 1990s (including Sierra Leone in 2000) a Lieutenant might well have taken this strategic reality into account as he weighed the option of standing his ground and chancing the lives of his men in a shootout with the Iranians, or inflicting strategic humiliation on his service and his country.

Of course, for many people today it might seem unfair to expect extreme risk-taking courage of a young officer. But such an unfair expectation was at the very heart of British naval culture for a very long time indeed, and it's remarkable that Sir Alan West – who was made Lord West by Prime Minister Gordon Brown six months after the incident – and the rest of the naval establishment were apparently so blithe about letting that tradition bleed away.

But then their attitude was made even clearer by what happened after the prisoners were returned. Despite what a former British CDS described as 'fawning, unmilitary behaviour' while in captivity and being paraded on Iranian TV (one rating wept about the loss of his iPod), the returning sailors and marines were personally met and greeted as heroes by the then First Sea Lord Sir Jonathon Band.

To put the whole incident in context it is important to remember that when a Royal Australian Navy boarding party found itself in an almost identical situation in the same waters in 2004 [13], its outnumbered sailors (male and

female) refused to surrender, cocked and aimed their individual weapons and the Iranians backed down after extending the confrontation long enough to preserve their dignity.

Note 2. The full report by Lieutenant General Sir Rob Fulton RM (Rtd.) into the capture of personnel from HMS CORNWALL by Iranian forces in March 2007 and the Board of Inquiry into the capture of six Royal Marines and two Royal Navy sailors by Iranian forces in June 2004 (a completely different incident not to be confused or conflated), have never been released in full, exactly because of the collapse in command and military-fighting ethos identified by Sir Rob in his report, and his scathing remarks about the competence and fitness of RN Senior Officers to lead Royal Marines in combat.

## ACCIDENTS

It's also worth putting in context the extraordinary number of serious accidents involving major RN ships since the beginning of the century. Up and until 2000, when the RN Fleet was three to six times its current size, in peacetime there was approximately one serious ship threatening incident per decade. Despite potential underreporting, between 2000 and 2017 there have been between 7 and 10 such incidents (including the collision of HMS AMBUSH (S120) with a Merchant Ship in the Straits of Gibraltar, in 2016) – on average one such incident occurring every two years. At the same time, the number of ships continued to fall. Such an increase cannot be explained by coincidence, by the technical complexity of modern warships (RN Officers are supposed to have educations commensurate with the challenges presented by their vessels) or even by the severe teething problems afflicting classes like the Astute and the Daring.

Note 3. For an in depth analysis of the RNs engineering and technical failings, see Paper 3 in this issue by *Thunderer*, Ibid.

## THE DEADLY ROLE OF SPIN

Another, less-noted aspect of the overall RN crisis in culture and leadership is the dangerous normalization of dishonest communications, both internally and externally. It is of course understandable that RN spokespeople will loyally support a current government's policy, and insist that the RN can still 'meet its operational commitments', regardless of the facts, and that the service's public relations staff will try to paint any accident or failure in the best possible light. But when Naval officers at all levels are expected or required to lie to the public and to each other on an increasingly frequent basis and in the normal course of events (ie not as part of an operation to deceive potential enemies) this can have a corrosive effect on morale, and, just as bad, undermine the service's ability to learn and improve.

For example it is hard to imagine many were reassured by the RN's blustering official response to the excoriating defence select committee report [14] of November 2016 and shocked media reactions to the revelation that the Navy was to lose its only offensive,



Admiral Sir George Rodney leading the British Fleet in his Flagship SANDWICH at the moonlight Battle of Cape St Vincent 16 January 1780 with SANTO DOMINGO exploding in background by Francis Holman painted in 1780.





HMAS ADELAIDE II (FFG 01) in the Gulf. Australian sailors used colourful language (Foxtrot Oscar) and aggressive tactics to repel five Iranian gunboats.

long-range surface capability – the Harpoon missile. This took the form of an open letter [15] by the First Sea Lord, Admiral Sir Philip Jones on the RN website.

Sir Philip's rhetorical broadside reassured naval personnel that while there are 'challenges' things are really fine with our 'first rate' Navy and its ships. Admiral Jones even tried to spin the retirement of the Harpoon, suggesting disingenuously that its loss would somehow be compensated for by recent experiments with autonomous systems [16] and planned trials of 'both an energy weapon and artificial intelligence at sea'. As all of Sir Philip's readers know perfectly well none of these projects are likely to enable a British frigate or destroyer to win a contest against a pair of enemy missile boats let alone a modern warship.

But then if war should break out in 2018 when the RN is entirely without anti-ship missiles, the only danger Sir Philip is likely to face will be from the widows and orphans of seamen whose lives he and his colleagues have jeopardized by this most foolish and irresponsible of money-saving exercises.

Similarly, when the RN admitted to 'technical issues' with HMS DUNCAN

(D37) after the powerless Type 45 destroyer had to be towed back into port after only two days at sea, everyone knew that this really meant that this latest catastrophic electrical failure on a T45 had temporarily turned the ship into little more than a £1 billion floating target. When HMS LANCASTER (F229) was mothballed in 2016 because of a shortage of trained crewmembers, the Navy said the Duke class frigate was being put into 'Operational Readiness'.

Of course it is not just the Royal Navy or the MOD that have relied on spin (and the gullibility, laziness, ignorance and corruption of the UK's diminished corps of defence journalists) to hide the reality of Britain's maritime crisis. Like so many parts of the British state that substitute marketing and 'branding' for the hard graft of good government, all the public and private institutions responsible for the Royal Navy's sad

transformation into a diminished, impotent but expensive parody of its former self, have put a great deal of energy into crafting dubious but reassuring narratives to disguise their failure.

You can see this in branding efforts like the renaming of the Type 26 frigate as the 'Global Combat Ship' (GCS). The latter is a classic example of the use of fashionable buzzwords to shut down critical thinking: 'Global' is a consultant's favourite because it sounds modern and cosmopolitan, and 'combat' sounds hard-core and battle-ready, but of course all the RN's blue water ships are 'global' and have been since the 18th century, and all warships are by definition 'combat' ships.

Unfortunately, renaming the Type 26 the 'global combat ship' does not actually make it any more 'global' or combat-effective than either its Type 23 predecessors or its foreign competitors. The GCS is merely the latest conservative [17] and expensive frigate design to come down the BAE-Royal Navy turnpike, one that is as likely to be an export flop as every major British warship design has been since the Leander class frigates of the 1970s.



Littoral Combat Ship (LCS) USS GABRIELLE GIFFORDS (LCS 10) delivered by AUSTAL USA.



BAE Type 26 Frigate with CEAFAF Radar one of the contenders for RAN SEA 5000 Future Frigate.

After all, the ASW version of the Type 26 will in some important ways be less capable than the ships it's replacing. For one thing it would have a hard time killing the submarines it hunts, as it lacks torpedo tubes and is completely reliant on its helicopter complement for the task. (If the weather is bad or the chopper is down with a mechanical fault, then the Type 26 will have to rely on its quietness to avoid being sunk by the sub it has located.) For another thing, like most recent RN designs the Type 26 has minimal ability to fight other surface ships. (Although equipped with a Mark 41 VLS silo, the RN apparently has no plans to buy anti-ship missiles compatible with the vertical silos.)

Sadly, while foreigners tend not to be deceived by such marketing flim-flam, this kind of branding is extremely effective in Westminster and the feeble remnants of what was once a vital and well informed Defence press corps. The fact that most potential buyers abroad see British naval designs as poor value, and that British naval shipbuilding has been outclassed by Spanish, South Korean, French, and Italian competition, has gone unnoticed by successive British governments (and the public), to the enormous financial benefit of BAE Systems, the company that has been allowed to become a monopoly supplier of the RN's major warships and indeed the British armed forces as a whole.

## WHAT NEXT?

Even if the GCS were truly an innovative and impressive design, its prospects would be hobbled by the decision of the Cameron government to go back on its plan to buy 13 of them (replacing 19 Type 22 and 23 frigates). Instead of purchasing eight anti-submarine versions and five general purpose versions, the government is now committed to buying just eight ASW frigates. This is fewer than a traditional ship class and that matters because you need to commission and build at least ten vessels to be able to assess their real abilities (to distinguish good, from poor, from average) and make appropriate improvements.

No one would expect either David Cameron or his chancellor George Osborne (who loathed the forces as atavistic, 'uncool' and detrimental to the Tory's new 'modernized' image), to

understand why cutting the number of Type 26 frigates would damage its export potential as well as ensuring that the fleet would only ever have four frigates on operations at any one time. But you might have expected at least one of the UK's abundant admirals to have gone to the mat publicly for a full complement of the ships.

Part II will examine further RN leadership, or the lack thereof, and the decline in British naval design; warship design by committees of public (civil) servants and their accountancy consultancy company bosses, and 'returning to the offensive', and touch on unique, British conceived/ designed concepts for versatile modular systems (VMS™) and Warpods™, that could provide for rescaling the RN; its capability, capacity, and purpose. ■

## FOOTNOTES

1. See e.g. *What the US Should Learn from Britain's Dying Navy* [http://www.realcleardefense.com/2016/08/11/what\\_the\\_us\\_should\\_learn\\_from\\_britain039s\\_dying\\_navy\\_284739.html](http://www.realcleardefense.com/2016/08/11/what_the_us_should_learn_from_britain039s_dying_navy_284739.html); Is the Sun Setting on the Royal Navy [http://foreignpolicy.com/2016/11/21/is-the-sun-setting-on-the-royal-navy-britain-russia-nato/?utm\\_content=buffer7d37&utm\\_medium=social&utm\\_source=twitter.com&utm\\_campaign=buffer](http://foreignpolicy.com/2016/11/21/is-the-sun-setting-on-the-royal-navy-britain-russia-nato/?utm_content=buffer7d37&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer); *How to Sink An Entire Navy* <https://warisboring.com/how-to-sink-an-entire-navy-410c3a93ad1f#nnw1mecf>
2. See <https://warisboring.com/how-to-sink-an-entire-navy-410c3a93ad1f#4yh5az5cw>
3. As the chairman of the Commons Select Committee on Defence put it "The fleet is now way below the critical mass required for the many tasks which could confront it, if the international scene continues to deteriorate."
4. See <https://www.publications.parliament.uk/pa/cm201617/cmselect/cmdfence/221/22113.htm>
5. See <http://www.dailymail.co.uk/news/article-2465608/Royal-Navys-260-captains-just-19-warships-Defence-cuts-15-times-commanding-officers-vessels.html>
6. See <http://www.thetimes.co.uk/article/no-10-covered-up-trident-missile-fiasco-hch3shsm>
7. See <http://www.standpointmag.co.uk/the-mole-june?page=0%2C0>
8. See for the argument that British Tory governments are historically worse for defence than Labour governments Labour's Defence Opportunity, Demos Quarterly, April 2014 <https://quarterly.demos.co.uk/article/issue-2/labours-defence-opportunity/>
9. See <http://www.breitbart.com/london/2014/11/15/we-can-do-better-by-our-veterans/> and <http://jonathanforeman.info/a-gi-bill-for-the-uk-demos-quarterly-january-2014/>
10. See <http://www.reuters.com/article/us-usa-iran-boats-idUSKCN0UW1Q7>
11. See <http://edition.cnn.com/2016/06/30/politics/iran-navy-capture-investigation-report/>
12. See <http://www.telegraph.co.uk/news/2465118/Iranian-hostage-Royal-Navy-captain-sacked.html>
13. See <http://uk.reuters.com/article/uk-australia-iran-idUKSYD14927220070622>
14. See <https://www.publications.parliament.uk/pa/cm201617/cmselect/cmdfence/221/22113.htm>
15. See <http://www.royalnavy.mod.uk/news-and-latest-activity/news/2016/november/25/161125-first-sea-lord-message>
16. See [http://www.theregister.co.uk/2016/10/11/ex\\_unmanned\\_warrior\\_royal\\_navy/](http://www.theregister.co.uk/2016/10/11/ex_unmanned_warrior_royal_navy/)
17. Apart from a gesture in the direction of modularity in the form of the ships mission bay.





## BASE LOAD = BASE COMMON SENSE = NUCLEAR

The NAVY Magazine with relation to the procurement of 12 DCNS Shortfin Barracuda attack submarines has for long maintained that the Deterrence Force is not only the submarines. It is also and essentially comprised of Australia's ability to build, fit out, crew and sustain such a submarine force in peace time – so that war might not occur. And if war was to occur, to have the strategic base industrial capabilities to build submarines at a more rapid rate – and to replace and repair losses. The Deterrence Australia provides is therefore as much as it is about the Submarines (and their associated Task Groups), as it is the strategic industrial base (SIB). As it was for The Doge of Venice, and the Arsenale. There is continuing debate about Australia's submarines, and whether or not they should be fitted with Air Independent Propulsion (AIP) systems. There is also an underlying debate that suggests nuclear propulsion should be considered for the latter batches – in what is already an extraordinarily long (and thereby risky) procurement and build process. If Nuclear power were to be adopted, it would in actual fact reduce risk, since the submarines were originally designed for such propulsion systems. And if one was to adopt Nuclear propulsion, say for the last batches, then one would need to have 9 such submarines to sustain 'critical' industrial and crewing (back-end) mass. That would mean building a combined class of 15 or having 3 diesel-electric trials and experimental vessels, and 9 nuclear powered versions. Such a strategy – which may subliminally be there through the choice of the Shortfin Barracuda – would need politically empirical sense-making of an order rarely demonstrated in recent years. There is continuing debate about the unbalanced, mad rush for renewables and targets of 50% RET in very short timeframes. Such politically inspired jumps of belief have contributed to power outages

in South Australia (where the Submarines are to be built) and putting strain on the rest of the network, including in Victoria and NSW. Funny old thing, as the Brits found out, the wind does not blow when it is either very cold (in UK), or very hot – and when demand is at its highest. At those times one needs the Base Load. In highly industrialised, green Germany, since the closing down of their nuclear power industry (after the Fukushima Nuclear power plant disaster), they have required each new wind farm to have an associated gas (or coal) base-load generating capacity for exactly those types of occasions. In actuality driving up its carbon footprint! Of course Germany also takes Nuclear power from France (which delivers 75% of its energy needs through clean, non-Carbon Nuclear power).

The Prime Minister states Australia 'has a vested interest' in making 'state-of-the-art, clean coal-fired technology' work and that \$590 million has been invested in clean coal technology research and demonstration. What is not said is that more has been cut out than was subsequently restored to the program. In actuality, Australia is back where it started with the need to resurrect previously scuttled research (as led by CSIRO until its scientists were all 'reorganised' and 'left') and demonstration plants to try to make carbon capture and storage a reality.

And even if that programme were to be resurrected, and the objective is to promote energy security; preserve base load; develop 'state-of-the-art' clean coal; and, to achieve emission reductions (a sensible programme), it appears that the Government may not have read the small print in the Act that is very specific about the types of technologies in which Australia can invest. Along with nuclear technology, investment in carbon capture and storage technology is banned.

Ironically enough South Australia was at one stage calling itself the Energy State, no doubt contributing \$Ms to the advertising accountancy consultancy companies that thought this one up

– rather than solving the base-systemic problems confronting the state. Any programme that actively prevents such research and industrial development, ties both hands of the suppliers behind their backs. No doubt there are some Green politicians that count this as a singular victory – but the rest of Australians who need the air-conditioning on when it is hot, to live, and when it is not hot, to work are beginning to take a contrary view to the 'fake news' and 'alternative facts' delivered by successive members of the professional-political elites (PPEs). This will not have been missed by potential enemies – meaning that the dereliction of sense and duty by the PPEs is already impacting Australia's Deterrence, and so making the world more dangerous and it more likely that we will have to fight one day, exactly because someone makes a strategic miscalculation.

Of course Nuclear power should be in the mix, as the Chief Scientist has occasionally mumbled, when his arms have been freed from behind his back. And Nuclear power with the industry necessary to sustain it (and shipbuilding) in the 'Energy State' is fundamental to Deterrence. It would therefore make absolute sense if fitted to our future submarines.

The most effective way Australia could meet its carbon capture requirements and maintain its RET commitments is through Base Load Nuclear (BLN). That would be good for Deterrence and good for our Submarines; our Navy and Country. Got right, as John Strang noted, in 15 years Australia could be generating Nuclear Power and developing and sustaining the type of back-end engineers and technicians necessary to sustain Industry and Navy. Nuclear makes sense – do any polities yet realise this and will they have the courage to say so?

## HOUSTON WE HAVE A PROBLEM...

Former Australian Defence Force Chief Angus Houston stated that 'it may be too late to stop Beijing's activities in the South China Sea'. Instead the focus should shift to ensuring freedom of navigation and the right of innocent passage, Sir Angus told a dinner conference on Australia-Japan-US strategic co-operation. 'In my view it is too late to stop the China program in the South China Sea' he told the dinner at the Australian National University, that 'we need more co-operation and less competition'. That may well be true but megaphone, armchair strategy by ex-Chiefs of Defence Force at this delicate stage in the positioning of the U.S., Japan, Australia and the Allies with regard to the South East Asia Sea and China, is not helpful. The signalling plays entirely into a bellicose Chinese mind-set and is more likely to escalate and encourage miscalculations to be made – such as that Australia may be divided from its Allies – than to de-escalate. In this regard, Houston is in danger of being cast as a 'useful idiot'; providing (along with some notable politicians) solace to a defeatist and declinist narrative, exactly when appeasement may no longer be viable (if it ever was). Glad-handing by retired senior-officer-talking-heads can be a risky business and, unfortunately, Australia's Upper House (unlike



Potential Shortfin Barracuda (Suffren class) image showing some similarity with the US Virginia class SSN.



Saudi Frigate AL MADINAH (F702) shortly after being hit by an unmanned attack craft (UAC).

the House of Lords) does not have the ability to promote retired Chiefs to the cross-benches, where their advice can remain loyally discrete. In looking to reform Australia's failing Senate, the Government might like to look at the Irish Senate (and the HoL), which both allow for these types of appointments within their ranks.

### **SAUDI FRIGATE STRUCK BY UNMANNED ATTACK CRAFT (UAC) ANTI-ACCESS WEAPON OFF YEMEN**

In an attack initially thought to have been by suicide bombers and subsequently confirmed by Vice Admiral Kevin Donegan USN (Commander US Naval Forces Central Command and US Fifth Fleet based in Bahrain) to be: 'an unmanned, remote-controlled boat of some kind' (or UAC), struck the Saudi Frigate AL MADINAH (F702). There is some conjecture that the attack by Houthi rebels fighting in the south of the country around Aden (and the Bab el Mandeb straits at the mouth of the Red Sea), and against Saudi backed forces – was intended for a U.S. Warship. The AL MADINAH apparently successfully fought off two UACs, but the third vessel got through; exploding under the flight deck on the ships' port quarter. The Houthis, in an increasingly bitter campaign against the Saudi backed coalition – which has reportedly used cluster bombs and other such banned weapons against the Houthis – are being supported by Iran, through the Islamic Revolutionary Guard (IRG) Corps.

The Yemen war therefore also represents an extension, by proxy, of the underlying conflict between Sunni and Shia; connecting also with the ISIS / DAESH wars in Iraq and Syria. The threat of the proxy wars in Syria and Iraq spilling over into a major conflict involving powers – such as the U.S. and Russia – remains pressing. In the convoluted way in which wars in the Middle East have been fought, U.S. and Australian support for the Shia Government of Iraq (supported / controlled by Iran), against the Sunni dominated DAESH (in Iraq and Syria), also sets the U.S. and its Allies indirectly up against Saudi Arabia. The Kingdom, with its brand of radical Sufi-Wahhabism that has been exported to Al Qaeda, and now ISIS / DAESH in the Arabian Peninsula, the Middle East, and cities in France, the UK, and parts of the U.S. and Australia. At the same time, the IRG represents a major faction within Iran's Byzantine political structures; committed

to the preservation of the Shia revolution and the Ayatollah. It is a past master in ratcheting up tensions when it needs to exercise power at home, and is deeply antagonistic towards the U.S. and any agreements – such as the Iran Nuclear Deal Framework – that might enable even minor rapprochement with the U.S. Successfully targeting a U.S. warship while inviting retribution, would nevertheless succeed in damaging this agreement, at a time when President Trump is moving more squarely behind Israel – Iran's 'first front', through Hezbollah in the Lebanon and also now in Syria, where the IRG and Hezbollah are also fighting. IRG-Hezbollah also claimed success in the attack against INS HANIT (503) on 14 July 2006. The attack, originally thought to be by a drone, has subsequently been identified as a missile, most probably a C-802 anti-ship missile, smuggled into The Lebanon by IRG for Hezbollah. The IRG were also behind the seizing of HMS CONRWALL's RHIBS in March 2007, and two USN riverine CB90-class fast assault craft in January 2016.

The Al Madinah-class frigates were built in France (Arsenal de Marine, Lorient (French Government Dockyard and CNIM, La Seyne) in the mid-1980s. Two Saudi sailors were sadly killed and three were injured when the AL MADINAH was bombed. Damage appears extensive and potentially also included writing-off the embarked helicopter a AS565 SA Dauphin?, damaged in the blast. The US responded by

dispatching the USS COLE (DDG 67 – herself damaged by an AQ suicide vessel attack (SVA), in the port of Aden in October 2000), in a sign of support to the Saudis.

At some stage, as the wars against ISIS / DAESH come to an end serious consideration will need to be given as to the role of the IRG in the region, and in Iran (and specifically Syria, where Iran is Allied with Russia (and, increasingly Turkey)). It is unclear whether or not a peaceful Iran can exist alongside the IRG, or the IRG will allow such a peaceful compact to be made. And since Hezbollah is a proxy-extension of the IRG, the same applies in the Lebanon and so to any realistic Middle East Peace between Israel and the Palestinians...

The IRG would count as a singular victory a successful missile hit (such as those attacks made by IRG-Houthi against USS MASON (DDG-87) in Oct. 2016) against a USN Ship, whatever the consequences, since such an attack would achieve and solidify its (not necessarily the ruling Iranian factions) strategic aims in the Middle East.

### **SPANISH NAVY SHIP EXERCISING IN AUSTRALIA**

The Spanish Armada ship ESPS CRISTÓBAL COLÓN (F 105) departed the Ferrol naval station, with a detachment of five Royal Australian Navy (RAN) personnel, bound for Fleet Base West in Rockingham, Western Australia, and arrived in mid-February. The ship will stay in Australia until mid-2017 taking part in a number of exercises and promoting Spain's bid for the SEA 5000 Future Frigate. Australian Defence Attaché to Southern Europe, Captain Ray Leggatt, and the Commander of the Naval Action Group One, Rear Admiral Spanish Armada, Alfonso Perez de Nardares, farewelled the frigate under the command of Commander Ignacio Cuartero Lorenzo.

### **DEFENCE CONTRACTS POSE WORKFORCE CHALLENGES**

Large contracts will need to be addressed post-haste, according to First Assistant Secretary of the Defence Industry Policy Division Kate Louis, who identified a huge opportunity around 'the contracting work that the Capability Acquisition



Five MV-22 Ospreys flew over 2,200 nautical miles to participate in exercise Cobra Gold 2015 being refueled by USAF KC-10. Image by CPL Joshua Murray.





Two FA-18 Super Hornets and two Royal Malaysian Air Force SU-30 Flankers fly above the aircraft carrier USS CARL VINSON (CVN 70), operating in the South China Sea / South East Asian Sea (2015).

and Sustainment Group (CASG) has done to bring the programs along'. In this context, she also referenced LAND400 project (for mounted close combat capability including for deploying forward in HMA Ships ADELAIDE, CANBERRA and CHOULES) as a prime example of Defence reaching out successfully to industry. First Assistant Secretary Louis also noted: 'The workforce base right across ADF, the public service, and industry is a challenge, it's going to be a challenge, from a national point of view, right through education, skilling and science, technology, engineering and mathematics (STEM) programs'.

### USMC AIRCRAFT DEPLOY TO AUSTRALIA

The US Marine Corps this autumn is sending its largest aircraft element to Australia, including four tilt-rotor Ospreys and five Super Cobra and four Huey helicopters (all capable of being deployed by HMAS CANBERRA and ADELAIDE (along with USMC AV8B Harriers and LIGHTNING II F-35B), all out of Hawaii – to the 2017, \$25 million rotation of Marines to northern Australia as the Corps continues to redistribute its forces around the Pacific and in preparation for Exercise Talisman Saber. The USMC moving to four major forward areas of operation over the next decade -- Japan, Guam, Hawaii and Australia -- as part of a 'distributed laydown' that seeks to deter growing threats in the vast Asia-Pacific region, particularly from China and North Korea.

### VICTORIA LAUNCHES DEFENCE CAMPAIGN

A new advertising campaign promoting Victoria's defence industry was unveiled by the Andrews Labor government to help secure major defence contracts, attract investment and create jobs. The state Labor government has a proposal with the two shortlisted bidders for the LAND 400 Phase 2 project – BAE Systems Australia and Rheinmetall Defence – to base their project activities in Victoria. The government was also a major sponsor of the Australian International Airshow 2017, which took place in late February. The Victorian defence industry contributes up to \$8 billion to Victoria's economy and includes more than 300 businesses, employing more than 7,000 people.

### DSTG RETAINS ACOUSTIC EDGE

Despite significant changes, a collapsing leadership and demoralised staff; including the marginalisation of Defence Science under the First Principals Review and the failure to promote science and defence above managerialist policy-wonkery, Australian scientists have managed to develop a world first naval acoustic signature model for use by ASW forces. The Australian Rapid Assessment Tool (AusRAT), developed by Defence Science and Technology Group (DST) in partnership with Frazer-Nash Consultancy (an Accountancy Consultancy Company by background – emphasising the lack of leadership provided by DSTG) over several years, is an extremely powerful tool in modelling the acoustic signatures for all classes of naval vessel. Defence scientist Dr Stephen Moore played an instrumental role in the AusRAT project. The tool provides approximate analytical models that allow a whole-boat radiated noise estimate to be run in just a few minutes. This is in contrast to commercially available modelling tools, which require detailed information to develop models and can take significantly longer to produce results. AusRAT will be used for the Future Submarine program (SEA1000) and the Future Frigate program (SEA5000) to predict the acoustic signature of the proposed designs to confirm they meet Australia's requirements.

### TURKEY BUILDS FIRST FRIGATE

Work began in early 2017 on Turkey's first national frigate as part of Turkey's national vessel project. Speaking at a ceremony at the Istanbul Shipyard, Defense Minister Fikri Isik said it was among the government's main priorities to have a 'strong fleet built using national resources'. President Recep Tayyip Erdogan said last year Turkey's defence industry would be self-sufficient by 2023, the centenary of the declaration of the republic while Prime Minister Binali Yildirim said the government had invested \$30 billion in the defence industry over the last 14 years.

### MATTIS BACK

It's good to be back and I'm grateful to serve alongside you as Secretary of Defence. Together with the Intelligence Community we are the

sentinels and guardians of our nation. We need only look to you, the uniformed and civilian members of the Department and your families, to see the fundamental unity of our country. You represent an America committed to the common good; an America that is never complacent about defending its freedoms; and an America that remains a steady beacon of hope for all mankind. Every action we take will be designed to ensure our military is ready to fight today and in the future. Recognising that no nation is secure without friends, we will work with the State Department to strengthen our alliances. Further, we are devoted to gaining full value from every taxpayer dollar spent on defence, thereby earning the trust of Congress and the American people. I am confident you will do your part. I pledge to you I'll do my best as your Secretary.

From those who have known and worked with you from amongst the Five Eye Nations, welcome back Secretary Mattis, General USMC. You are always welcome on these Australian shores you know so well.

### GREENWICH STATION

Readers will have noted the reduction of *Greenwich Station* in this issue. The reason being that the running criticism of the British Royal Navy has been much better and more eloquently expressed in Paper 2 by Jonathan Foreman and Paper 3 by Thunderer. There is no joy in reporting on the current leadership and materiel state of the RN. It is only through honest critical thinking of its current state that the RN may return to its previous deserved position amongst the Common-Wealth Navies (including the USN). It is of strategic importance to the Global West that the Royal Navy and the UK re-claims its place amongst the Allies as soon as possible. You are sorely missed.

### CN WRITES A BOOK

Chief of Navy, Vice Admiral Tim Barrett AO CSC, RAN launched his book *The Navy and the Nation: Australia's Maritime Power in the 21st Century*, in January. As noted in the Presidents Page, and Letters, frequent request were made to engage with CN on proposals to suitably commemorate the 75th Anniversary of the Battle of the Coral Sea. Attempts have also been made to provide to both Chief of Navy and DCN personal copies of the NLA's recent Book: *Keeping Watch: A History of the Navy League of Australia, 1895-2015*, which has received strong reviews. The NLA would still like to present a copy of *Keeping Watch* to both CN and DCN if their staff can find the time. *The NAVY Magazine* would be delighted to review CN's book if he or his staff might like to send a copy to: The Office of The Editor, THE NAVY, Navy League of Australia, GPO Box 1719, Sydney, NSW 2001. Of course, it might be more courteous to arrange an 'exchange of books', when both presentations can be made. ■



The Royal Ensign, colloquially known as the Red Duster has been around since the 17th Century when it was flown by the Royal Navy and later adopted by British merchantmen. The current design, a red flag with a Union flag in the first quarter (Canton) was introduced in 1707. To avoid confusion, in 1864 the Red Ensign was officially designated as the ensign to be flown for merchant ships and the White Ensign was introduced for the Royal Navy.

The Australian Red Ensign design, a red ensign with Commonwealth Star and Southern Cross design dates from a competition held by the Commonwealth Government and was introduced in 1901 and is the only flag permitted to be used by ships registered in Australia. Pleasure craft may use either the Australian Red Ensign or the National flag, but not both.

### THE AUSTRALIAN MERCHANT NAVY

A few facts: - The latest available records of the Australian fleet are for the year 2013-14 and are set out in the Department of Infrastructure and Transport's official magazine Australian Seafreight. The records are misleading, insofar as they list the number of vessels in the Australian Trading Fleet (over 2,000 t dwt) as 79, whereas only 25 were Australian registered vessels. The remaining, 54 vessels, are foreign flag bulk carriers, container ships, tankers, livestock carriers; included as part of "the Australian Trading Fleet" because they are owned or operated by Australian entities. Most of these vessels are wholly or partially engaged in international trade.

### COASTAL TRADE

Allowing for recent changes, as near as can be adduced, the total number of Australian flagged and crewed vessels engaged in the coastal trade is 11 vessels over 2,000 GRT; comprised of 2 x Ro-Pax Bass Strait Ferries, 5 Bass Strait cargo ships, 3 Cement carriers, 1 Trans-Tasman cargo vessel. Approximately 16 foreign flag vessels have been granted Coastal Trading Licences permitting them to participate in the coastal trade.

### OVER-EXPOSURE OF GERMAN BANKS TO SHIPPING

Since 2014 financial pundits have been warning of the German banks exposure to shipping. German banks are struggling to recoup billions of dollars of loans as the decade long shipping slump hits home. Their exposure is believed to be around \$ 100 bn, a quarter of the estimated worldwide debt of \$400 bn. The risk stems from prior to the Great Financial Crisis of 2008 when closed investment funds – called KG Houses – encouraged doctors, dentists and high wealth individuals to become shipowners, buying ships and leasing them to shipping companies. At its peak the Houses had 440,000 investors encouraged by big profits and tax incentives. Then after the GFC, came the slump and companies such as the South Korean shipping line, Hanjin collapsed – a company of 98 container ships and a total fleet of 142 of which only 38 were self-

owned. Most of the large shipping companies have very similar ownership to charter balances so that the entire sector is exposed.

As an indication of shipping fortunes, prior to the slump, Very Large Crude Carriers or Bulk Carriers were earning up to \$ 200,000 per day, now the same vessels are earning \$ 10 -15,000, barely enough to cover wages and running costs. Shipping was always a less speculative business, traditional owners knew that the industry was cyclic but were in it for the long haul. Then the smart new financial whizz kids, the Student Princes, with no knowledge of the industry or loyalty and suckered by the market parvenus arrived. If it didn't show an instant return – sell it – and they did.

### INTERNATIONAL TRADE 2016

LNG – There are 4 Australian flag LNG Tankers, which in conjunction with 6 foreign tankers are engaged in the transport of LNG from the NW Shelf.

### MAJOR AUSTRALIAN EXPORTS AND IMPORTS

Iron Ore -Total exports of Australian Iron Ore in 2016 were approx. 750 m tonnes. Coal - Total exports of Steaming & Metallurgical Coal were approx. 475 m tonnes; Petroleum - imports to Australia – all grades 52,205 m l, approx. 43.35 m Tonnes,

None of the aforementioned export or import cargo was carried in an Australian flag vessel .

### MARITIME EXECUTIVE

3rd Jan 2017, two container ships collided in the Straits of Johore, Singapore flag, 2,496 teu, Taiwan owned "Wan Hai 301" and Gibraltar flag, German owned, "APL Denver". APL Denver suffered a holed bunker tank resulting in a loss of 300 tonnes of oil and consequent oil spill.

25 Jan 2017 The Minister for Infrastructure and Transport, Darren Chester, says that the government is committed to "reform" of coastal shipping, saying that Labours' coastal trading system has failed to revitalize Australian shipping or create an environment where we can compete globally. He said he planned to bring legislation into Parliament to "enable positive, long lasting, economically sustainable change, allowing businesses efficient and cost effective shipping.

### CHINA ANNOUNCES CHANGES TO MARINE SAFETY LAWS

The Chinese Government is looking to introduce changes to marine safety laws that will require foreign submarines to surface and fly their national flags when transiting Chinese claimed waters. This will undoubtedly have a significant impact on tensions in the South China Seas and is clearly intended to raise as an act of provocation any passage of a foreign submarine

through Chinese claimed seas. The subterfuge being claimed is that the Government considers the submarine passage to be a threat to safety, which is of course applicable to recognised maritime sovereign limits, but would not be applicable to claimed areas – notably those claims that have already been unequivocally rejected in total by the Permanent Court of Arbitration in The Hague. Nonetheless, the U.S. is still not a signatory of UNCLOS, unlike China. It would appear that China is manoeuvring to isolate the U.S. from its traditional regional Allies, while seeking ways of working within the Law – which does provide for certain exceptions / exemptions in matters regarding warships, defence and security. Ultimately any informal agreement by recognition of nations to adhere to these requirements will provide de-facto recognition of China's claims, and therefore provide the bases for precedence. Dangerous times.

### FATIGUE INCREASING

An internal IMO study has found that fatigue levels among seafarers, particularly Masters and Watchkeepers, is increasing. Masters do more on a weekly basis than do other crew members, however no one on board gets enough sleep. There were also differences in working patterns, with Chinese seafarers averaging 15.11 hours of work per day, compared with 10.23 hours for Europeans and stress levels were found to be higher amongst Chinese managed companies.

### IMPROVE WATER QUALITY

The international convention for the control and Management of Ships Water Ballast and Sediments comes into force on 8 Sep 2017 meaning that for the first time outside Victoria, domestic ballast water – known to be potentially damaging to aquatic organisms – will be regulated.

### BAN SUPER TRAWLERS

The Tasmanian Government is looking to ban super trawlers from operating in its waters; following concerns about the rapid depletion of fish stocks.

### RECOGNITION OF SEA-SERVICE

After 75 Years, Mrs Sadie Horton has been recognised by the U.S. Department of Defense as a WWII Veteran of the US Merchant Marine. In 1942 after her son was killed when his tug was sunk by a German U Boat, Mrs Horton joined as a crew member of a tug skippered by her Husband and sailed throughout the remainder of the War in costal and inter-costal barging operations. Barging played a significant role in moving bulk cargos and war material along the Eastern Seaboard, in preparation for the Normandy/D-Day landings in 1944. ■



# SYSTEM VARIETY: COMPARING RN & USN ENGINEERING – TAKING ‘THE LONG VIEW’ PART I

By Thunderer

**There are many things UK did very well, during the post WW2 period, using lesser resources than the US. The reasons are worth dissecting, since they offer a longer-term and historic perspective compared to the more narrowly focussed acquisition studies like Jordan-Lee-Cawsey or the more recent Gray report. However much evidence has been discarded as organisations were re-shaped; the result is that history is lost, and is only partially viewable through the archives. This is a much wider subject than just the Royal Naval engineering branches [1]: Part I examines cultural variety in terms of capability and system divergence between the RN and USN within a historical-contemporary setting based on weapons engineering, whilst Part II will consider these differences through the lenses of the marine and air engineering organisations, and wider defence project management skills.**

Achieving Maritime capability is a complex endeavour that builds on the joint efforts of: policy staff in MoD Main Building, the Procurement Organisation (with embedded RN personnel), scientific advice from the Research community, and front-line ‘users’ represented by Navy Command Headquarters [2].

## MANAGEMENT OF DEFENCE CAPABILITY

The UK Defence Lines of Development (DLOD) are described by the TEPIDOL acronym [3] which mirrors the DOTMLPF and PRICIE constructs used by other Coalition partners. Despite the hype, there is no effective mechanism to ‘trade’ between UK’s eight headings, which is compounded by a compartmentalised costing structure that separates resource, and capital spends; these issues particularly impact on the personnel part of the system (covered later).

Lessons Learned from the Falklands – this campaign success generated about 5-8 years of headroom for the Navy against baleful Treasury influences, but then evaporated:

- It will be interesting to see whether the Iraq/Afghanistan bonus for the Army similarly wears off over time.
- The RN have been excluded from the top defence post (CDS) for some time, despite contributing more than half of the in-theatre force in Afghanistan for extended periods, succeeding in both Sierra Leone and Libya (though blamed for the Cornwall boarding team debacle).
- The UK have ‘pastel shaded’ their defence planning scenarios, to be manageable within the overall cost-ceiling imposed by SDSR, which was not anchored in the strategic reality of a resurgent Russia, or the PRC’s wish to dominate the South China Sea. With training outsourced to *Flagship* (Collingwood) and *The Defence Academy/Cranfield* (Shrivenham), there is no scope for any subsequent savings, due to the ‘block’ nature of

the contract. This also reduces the shoretime of uniformed ‘trainers’ so constraining harmony. Another example is the fixation with managing travel & subsistence as a discrete budgetary line item, despite it being dwarfed by the staff time (at capitation rates) being expended. More mature organisations fully cost their projects, with effort being interchangeable with T&S, to the best overall effect to the Crown.

UK has had too many ‘initiatives’ in the IS area. JCSI/JBD and NEC were virtual constructs) that consumed huge amounts of staff time & effort. The US version was NCW (led by Cebrowski) but this was only a bumper sticker, it didn’t hijack the whole Pentagon effort; though it led to later difficulty in killing off non-compliant CIS programmes.

There are some essential differences: ‘pork-barrel’ politics have a larger impact in the US (especially over Base Re-Alignment and Closure) due to the sheer scale of their country, making each facility, key to its local state economy. In contrast, the UK has much smaller physical separations; therefore closures have less regional impact, until special pleading occurs for Scotland, Ireland or Wales.



Lynx with Anti Tank Missile Capability and Apache Aircraft operating from HMS OCEAN (L12) - both capabilities were initially prevented by UK (MOD) and were engineered on board.

## EVIDENCE BASED DECISION MAKING

There are cultural differences between the Nations approaches, and whilst UK has been consistently good at Operational Analysis to underpin defence decisions; in comparison, the US DoD were often 'led-by-the-nose' by their contractors (so called beltway bandits) working in the Pentagon. However in the UK, there has been a recent bias towards preference (rather than evidence-based) acquisition; cost-effectiveness has taken second place to affordability within an overall cost profile. This has ignored any defence risks, which have been subordinated to the Treasury macro-vision. Despite the obvious risk to UK, none of the 'seniors' (at 4\* level) have exercised their preserved right to see the Queen, or taken resignation action.

Some minor capabilities have been dropped to make trivial cost savings, leading to inflexibility. The result is a 'command economy' that requires centralised control to deploy more specialist teams (diving, Explosive Ordnance Disposal, Force Protection, LDET boarding, Contractors on Deployed Operations (CONDO)) to augment ships. The law of unintended consequences has resulted in a de-natured role for ships staff, and contributed to the current RN Technician melt-down.

Removing systems towards end-of-life makes small support savings, but leads to a capability 'trough' when the replacement programme is not brought forward (e.g. Harpoon). This is widely perceived as the 'hollowing-out' of the RN.

## INTERNATIONAL ASPECTS

The Five-Eyes coalition (AUSCANNZUKUS) have relationships between the Naval Staff's or the similar The Technical Co-operation Program (TTCP) covering science, research & development which are uniformly good [4]. These provide peer group support, but performance is wholly dependent on the staff that are assigned by National Leaders and that the study teams have to build on existing national research work. Junior partners should also be aware of the different US approaches:

- When they are in a leading position, expect them to enforce bilateral relationships, where not having an open forum allows the US to disguise differences in build-standard (for example, Harpoon). The US may well kill-off challenging projects by offering their own products without recouping development cost (Britmiss v JOTS). Another example would be the USN JMCIS library of pooled software – tightly bound to UNIX and TAC-3 or -4 hardware.
- In contrast, when there is a more open playing field, expect the USN to participate, but beware of their predatory attitude to Patents – for example, the Fresnel version of deck landing sight, or the more recent RTOF buoy, where the US sought to patent inventions they did not originate. The US have a strong record on intellectual property rights (IPR), which in some areas like CEC has allowed them to compete development, then separately to re-compete production, in order to squeeze out costs. In contrast, the UK is poor at patenting, for example not capitalising on development of the Liquid Crystal Display (LCD).

Note the relative longevity of the USN's gurus: Nuclear (Rickover), Aegis (Meyer), Steam Machinery (Bowen), IT (Cebrowski/Tuttle). There are no equivalent UK senior engineers (except maybe Mackenzie for Polaris); Benjamin's analysis of his own work is flawed.



HMS OCEAN (L12) Returning to Base Port Plymouth being led by an LCVP(5) after Sierra Leone in 2000. The RN Flag Ship is due to decommission in 2018 with no replacement.

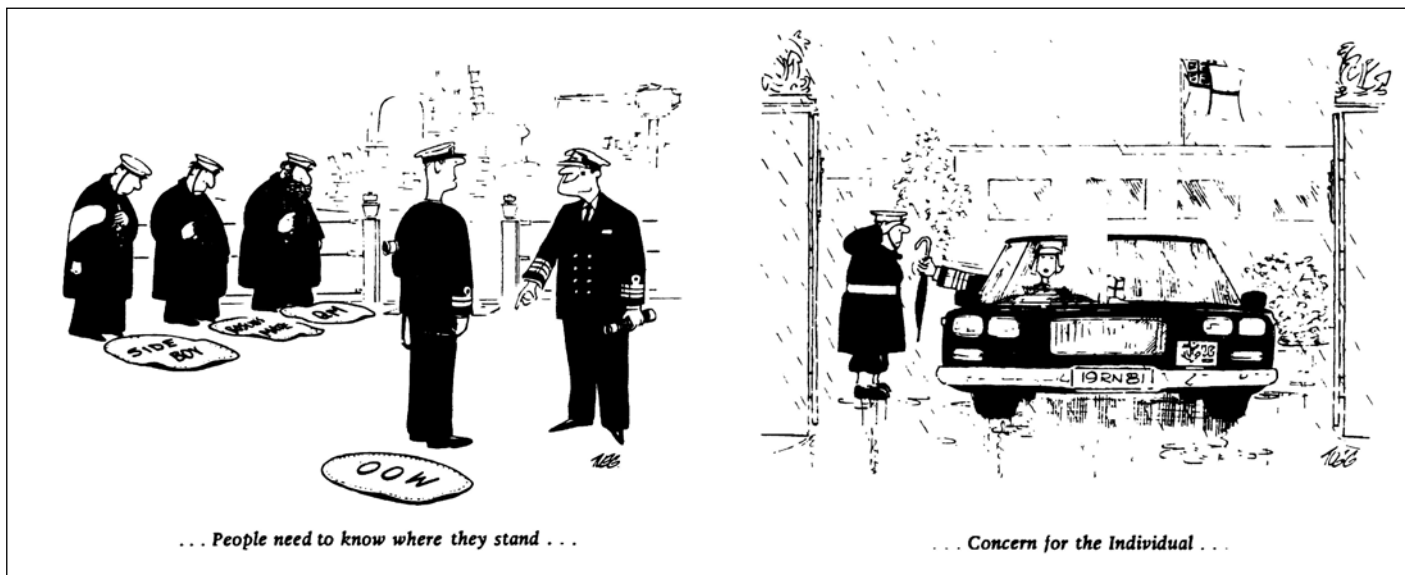
## EXPERIENCE & LESSONS LEARNED

**Weapon Engineering.** There are several areas where UK could be considered to have done well in the post-war period, in terms of exploitation and 'pull through' from Research, to acquisition and service usage:

- **Air Defence Radars.** After 984, there were a series of cancelled radar projects including Broomstick and STIR. Eventually there was a renaissance via the research programme, leading to collaboration with the US on BMD. Whilst the earlier USN flat-faced Aegis radar (a high-power RFTx, with passive array using ferrite switching to generate beams), the UK technology demonstrators (MESAR→ARTIST) use an active array built of low-power Tx modules. This was exploited via the Sampson two-faced (rotating) phased array radar (1045), and then Artisan (997). UK has two manufacturers for such modules: Ferranti Edinburgh/Selex and Siemens-Plessey (now BAe) at Cowes. Success was based on sustained MoD commitment over a relatively long period; the future trajectory is unclear.
- **ESM.** Research effort led to series of successful EW systems (the UA series) with notable work to develop the instantaneous frequency measurement (IFM) receiver, and the user interface. The exception was UAF (an early CPS failure, abetted by a unrepresentative test scenario). Most development areas (like the digital receivers and library sorter) were MoD led, though the de-interleaver came from industry. The future is a relatively stable industrial environment, but requires continuity of effort in order to remain an intelligent customer; it would not necessarily function if turned-off, and then restarted in the future. In contrast to ESM, jammers have been a much more problematic area, due to low usage, lack of commitment and cheeseparating of spares support.
- **Command Systems.** Overall, the RN had a roller coast ride with its Post-War AIO and C2, with pronounced highs & lows.

ASWE led much of the early digital innovation, but after the award of a single hardware/software contract to Ferranti in Feb 1965, there was a progressive estrangement between science and acquisition. After the Falklands, an arms-length procurement relationship (plus a pedestrian requirement) facilitated the CACS disaster. This was compounded by not having an 'in-house' software development capability and





By Tugg Getting thing's done (b) 1981 [5].

unlike the USN, Netherlands and France, the RN were less able to be 'intelligent customers'.

The USN has shown real strength in their human factors work, triggered by the Vincennes incident. This led to Naval Postgraduate School student work on TADMUS, RoE and DSS tools, that informed prototype JOTS-CSS, and TLAM mission planning; because they owned the IPR, they were able to re-compete later phases.

In the UK, the CDS X-model and DFTDS showed the value of technology demonstrators; though not be taken forward, these significantly 'raised the bar' of user expectations. However the remainder of the research programme achieved little or no 'traction' or exploitation into later acquisitions.

The latter part of the post-war period has been marked by an accelerating pace of change. Command & Control (driven by Commercial Off-The-Shelf technology) has been changing at twice the rate of other ship systems. Currently, the RN has exploited COTS computer hardware to make savings, but there is little understanding that commercial operating system software represents a potential cost-escalator thereafter.

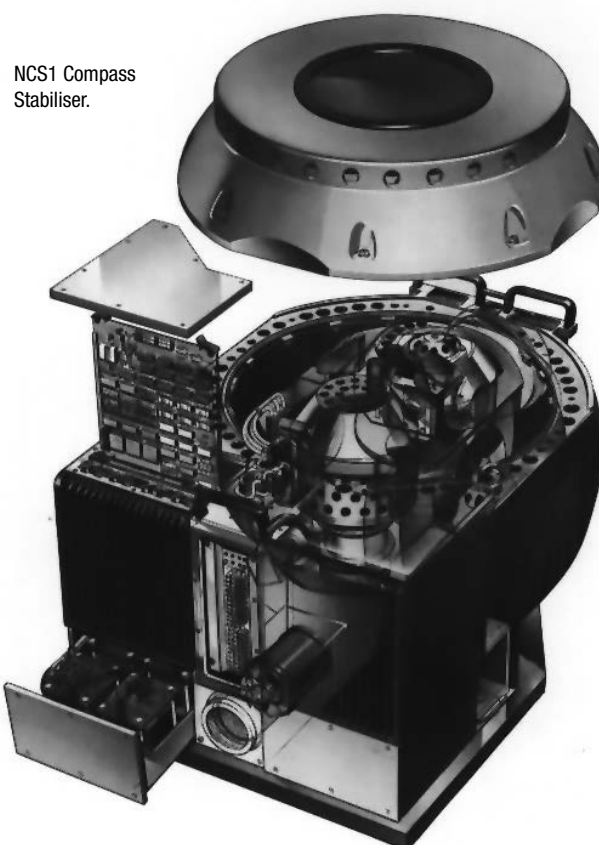
The USN experience with Aegis v CEC integration reinforces the need for modular programmes, regression testing, and a drive towards open standards. There has been little actual research pullthrough, despite huge effort committed to demonstrator programmes. There are real commercial tensions between vendors and research, and MoD has few levers to enforce open standards architectures or to introduce real competition.

**Data, Comms and Optics.** The USN had a long buy-in to UNIX and TAC-3 and -4; in this area, UK did better with RN CSS, accepting the cost of commercial INRI licenses, but were then able to move across to modern Windows operating system much sooner. The US did useful work on flexible configurations for Command spaces with non-operational CIS like GCCS(M). The experience of recent UK programmes emphasises the need to contract for space, weight, power and to flood-wire LAN cables, but to leave detailed design/outfitting until much later in the shipbuilding and outfitting sequence

- **Data Links.** Long, complicated relationship with NATO partners to development TDL, and struggle to make Link 11 work. MoD is now beholden to industrial consortia, who have their own agenda.
- **Comms.** UK led on satcoms for ships, and was also good at HF wide-banding. Research support was quite firm, up to the point where the Skynet 5 contract was awarded to the Paradigm consortia

in 2003. Since contract award, there has been a major rundown in intramural support as staff retired, and Dstl now has minimal capacity to assist DE&S as an intelligent customer, except for the niche area of submarine VLF communications.

- **Electro-Optics.** UK EO effort had a Malvern-centric focus, to support Land operations like Northern Ireland, and culminated in the large-scale Albion TICM programme. Future work is likely to involve re-packaging existing components, rather than seeking new technology, but places a premium on overall system design that incorporated foreign components. The national industrial base could well lapse; this would have a negative impact on UK's ability to obtain release of substitute technologies from the US.



**Missiles and Torpedoes.** The USN (after its problematic 3T get-well programme) has had a long run of success in 'spiral development' of its Standard missile, with a common interface to a variety of launchers and inboard systems. In the UK, research advice was pulled through into Seadart, Seawolf, Exocet and Harpoon, though there was less involvement in Aster/PAAMS; and the lead has transferred over to the Complex Weapons endeavour and MBDA. The sequence of Mk 24, Stingray and then Spearfish torpedoes (plus follow-on Mod 1 updates) shows that doing serial projects in succession is a major factor in overall success.

**Sonar.** Whilst the RN had a sound position in the early 1950's with 170 and 177, this lead evaporated through the protracted development of 184M (kept alive by a solo Warrant Officer in WESPIT, trickling in elements of the solid-state GI750). UK never adopted the brute force approach of SQS-26 or -53. Canada led the work on Variable Depth Sonar, and whilst the RN tried a big body (192 ≈ 177) it then settled for a much more pedestrian (170 sized) 199. The Anglo-American sonar trials in Matapan covered both bottom-bounce, and a high grade duct sonar that became 2016; the follow-on 2050 was better.

Later sonars also exploited MoD's IPR over Curtis architecture derived from the towed array programme. Given most skills were in Portland/Winfrith (now Krupp-Atlas), any UK knowledge base is likely to fragment or disperse. The evidence from internal self-noise problems in 2020 is that continuity of scientific and capability advice skills is required; however the most recent duct sonar (2091) is imported from the US (EDO). The evidence from minehunting sonar (2093) is that resurrecting an intelligent customer is difficult after a long pause, after the relative success of 193M. Internal Comms. Initially MoD led projects made a significant improvement in human factors effectiveness (via VCS) in RN ships, compared to

equivalent USN platforms. UK also delivered an advanced analogue internal comms suite (RICE) that could be safely scaled by ship designer with little risk. After this plateau, platform prime contracting introduced a digital ICMS that is now the Achilles heel of the LPD. Network technology is key to performance, but has been outsourced, and there is no independent UK skills base to ensure the continued availability of such COTS based systems.

## ENGINEERING PERSONNEL

The RN have endured a perfect storm 'melt-down' in Engineering. DE&S changes and savings: spares ranging and CONDO all denatured on-board Engineering skills and morale; savings made without joined up thought, to meet narrow financial targets, without regard to wider impact on capability. In parallel, senior management were fixated with operational tempo, making statements that praised 'running hot', or 'sweating the assets'. Overall Force levels v commitments are unsustainable, causing the demotivation & retention problem.

One temporary fix was to import French and USCG staff, on terms that will further de-motivate the remaining RN staff. Other palliative measures are Project Faraday and SIP (Support Improvement Programme), but these will be slow acting (due to the hysteresis 'lag' that affects morale & retention). Temporary Financial Incentives (TFI) represent another retention measure, paying maintainers a £30k bonus for an extra three years' service.

## GENERAL OBSERVATIONS – PART I

The above points also support some general observations and wider lessons learned:

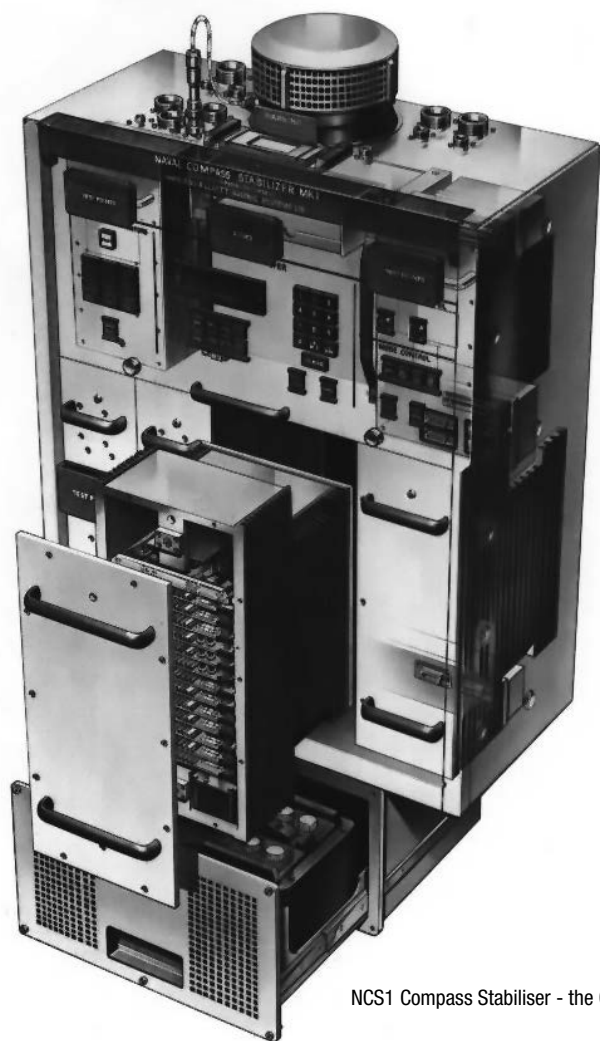
The evidence is that development and acquisition projects go better when they are undertaken in sequence, to give continuity of the corporate memory and knowledge of 'what works', examples are the relative success in: sonar, torpedoes and ESM system projects. There are real problems when projects are more widely spaced out, since knowledge and hands-on skills lapse, and cannot easily be regenerated.

There are also problems when a new system leads to a plateau in capability, since there was no incentive for procurement organisations to commission future research. Notionally successful projects also face a 'honeymoon period' – examples 996 and NCS1, where the initial euphoria was followed by a deep trough in the perception of the system, due to 'second eleven' maintainers and logistics, spares, support and training shortcomings.

Projects formerly enjoyed a creative blend of Naval applicators (both user and technical), scientists and PE staff working in concert. The sequence of DPA's formation, collocation and more recent changes focussing on acquisition process have watered down the 'added value' of the DESG staff pool, which now lacks refreshment from inward rotations of science and RN grades; remaining staff could be accused of being little more than technical clerks.

Other problems include inadequate requirements: i.e. CACS was only half generational leap ahead (at a full projects cost and effort), UAF as part of the CPS process had a lightweight test specification that favoured the vendor, or Soothsayer where a slothful procurement allowed the requirement to change underneath the project, leading to eventual cancellation.

Overall, more than two thirds of project technology leads have appeared to have come from government sponsored work, whilst less than one third came from industrial private ventures.



NCS1 Compass Stabiliser - the Guts.



## ENGINEERING LEADERSHIP OBSERVATIONS – PART 1

Recent UK Governmental ethos emphasises a very directive (down the line) Management style to implement change, but appear to ignore the Leadership requirement for a reverse flow of information in order to reconcile risk and consequences.

It's not clear whether the RN values Leadership at all, and the pendulum has swung entirely across to process-based management. The reason may be that true Leaders are prepared to challenge their higher management if the circumstances require it, to tell truth to power, or indeed to say No, rather than meekly accepting each directive be passed down-the-line. This isn't a shop steward role; but it does require a backbone, and it can be career limiting. Leadership is carrying your people with you, and this requires that there are accurate (if uncomfortable) communications both upwards and downwards; it's not merely cascade briefing the usual heap of manure.

Our current RN, MoD and Civil Service management would find officers displaying Leadership to be a real challenge. It is perfectly possible to make more senior management aware of unpalatabilities, or to request powers of direction; the prudent officer really should keep a copy of advice he/she gave to their seniors, just in case there is a subsequent inquisition..... (!).

A closely allied weakness is career management. Overall shortages lead to wholesale gapping and 'churn' of staff who may be key to delivering new projects. The problem is that the manpower 'pyramid' was sized using percentage margins like advancement or the higher training quota, which gave some flexibility to manage moves to best effect. As the RN has downsized, this % margin has reduced, despite empirical evidence that the small number (tending to zero) may increase friction, and cause new problems, because the 'float' is insufficient to allow a pragmatic best fit, in near term manning targets are to be met, no matter what the collateral damage caused.

In Part II the essential cultural differences in engineers and technicians fundamental to enable maritime systems to deliver in time and evolve over time, will be examined, along with wider defence project management skills.



A reconstruction of Stonehenge - the world's largest undocumented computer [6].

*Thunderer* is a former RN Engineer Officer, with several sea-going appointments including a Head of Department tour in a frigate, and in a destroyer during the Falklands conflict. He had a wide range of other jobs ashore, including: research, procurement, and latterly in a 4\* headquarters. He is a Chartered Engineer who is domiciled outside UK, and had most recently been working as an analyst for renewable energy projects.

**Note:** The Royal Naval Engineering College Manadon, HMS THUNDERER, was closed down in 1994 as part of the so called 'Peace Dividend' or 'Front Line First' cuts driven through in the early 1990s – largely at the expense of engineering and logistics (the fundamental strategic enablers of an effective Navy). It is now widely acknowledged that the decline in engineering standards and the subsequent collapse in engineering morale in the RN can be traced to this time. There are no plans in being to restore the RN Engineering Corps. In fact, under current plans, the stripping out and outsourcing of strategic engineering knowledge and its associated technos continues apace. ■



RNEC Manadon (where many RAN / RNZN Engineers undertook graduate and post graduate application courses) c. 1980s now a Housing Estate. A metaphor for modern UK.

### FURTHER READING

Frederick P Brooks (*Mythical Man Month*). Addison-Wesley, 1995. "How did your project get to be a year late - One day at a time!" p153.

Robert J Graham (*Project Management as if People Mattered*). Primavera, 1989. "Managing for Creativity – one doesn't discover new lands without consenting to lose sight of the shore for a very long time, pp183.

Rick Jolly (*Jackspeak*, 1989) and (*In-Confidence*, 2004). Both Palamando Press.

### FOOTNOTE

1. For the historical and people-centric aspects of the Weapon Engineering branch, see *The Greenie*, Patrick A Moore (2011), The History Press, Stroud. Based on material contributed to a 'Line Book' for the branch 50th celebration in 1996.
2. Given the devolution of some powers formerly held by central MoD, to the Front Line Commands.
3. TEPIDOIL (Training, Equipment, Personnel, Information, Doctrine & Concepts, Organisation, Infrastructure, Logistics).
4. Especially when Action Group's (AG) with time-bounded charter were introduced to replace ossifying Technical Panels (TP); but note The Travelling Cocktail Party sobriquet.
5. Tugg's eponymous cartoons, from *Getting Things Done* (1981). Note that the foreword to BR 1992 (the RN Divisional Officers Handbook) had Jack (and later Jill) were 'the most important single factor'. This is a message that the RN has comprehensively forgotten.
6. "A reconstruction of Stonehenge – the world's largest undocumented computer", see Brooks (1995), pp.162-3. The statement equally applicable to the NCS1 compass stabiliser.



# AUSTRALIA'S MARITIME INDUSTRY STRATEGY

By Cameron Eadie

**Australia, the world's largest island nation is dependant upon a robust maritime sector. The Maritime industry alone, through an array of manufactured products and services contributes over \$8 billion annually to the economy. The Australian maritime industry has the fifth largest shipping task in the world largely occupied with export of raw commodities and is well on track to become the largest exporter of LNG by 2018. In total, the Australian maritime industry includes ship and boat building, repair, component manufacturing and marina development operations. Over the years, through employing around 22000 people as well as being vital to the economic stability and growth of many coastal regions around Australia, the industry has demonstrated a strong capacity to successfully operate in both domestic and international markets. A complete consideration of Australia's maritime industry strategy would incorporate its importance as a considerable contributor to the economy as well as its vital role in support of defence capability. For the purpose of this essay, economic factors (trade, fishing, aquaculture etc.) will largely be ignored with primary focus being directed towards the current state of Australia's defence industrial capability.**

## INTRODUCTION

This paper's purpose is to determine the ability and possible future direction of the Australian maritime industry required to support Australia's defence vision for the future. It will also attempt to highlight the fact that development of an indigenous defence industry, including strong research and design organisations capable of supporting future warships and submarines through all the phases from design to construction to ongoing maintenance and repair, is only possible through a strategy which recognises the importance of a stable and continuously modernising maritime industrial sector. In order to effectively explore and define Australia's maritime industry strategy, one must first recognise that the issues which affect Australia's commercial maritime industry, directly effect the nation's greater defence capability. Of equal importance, any legislative or policy measures which influence our ability to remain commercially productive and competitive on the international stage, also have true and measurable consequences. The point being, these issues cannot and should not be considered in isolation. To a greater extent, the issue of the Australian government looking beyond the balance sheet to placing the appropriate level of prioritisation towards investing in Australian Defence Industry will be explored in some detail.

## SLOCS

From a strategic viewpoint, the maintenance of sea lines of communication is essential for not only achievement of objectives within the ever expanding and complex battlespace, but also essential to trade.



Defence White Paper 2009 - Defending Australia in the Asia Pacific Century Force 2030.

As Corbett defined, command of the sea means nothing but the control of maritime communications, whether for commercial or military purposes. The object of naval warfare is the control of communications which clearly has both defensive and commercial context [1]. Fast forward to today's strategic landscape and it's clear that a decisive and ultimately productive maritime industry strategy remains highly relevant, providing leverage to pursue Australia's defensive interests. As Australia's Navy continues to modernise following the release of the 2009 White Paper, Defending Australia in the Asia Pacific Century: Force 2030, and the government announces plans for fleets of new submarines, air warfare destroyers, frigates and patrol craft, the overarching question remains of how the Australian maritime industrial sector can remain competitive throughout the ruthless bidding process and represent a viable option for defence. Clearly, public opinion is highly

supportive of locally built hardware, and from a defence perspective represents the ideal solution, however historically, purchasing and building platforms overseas often represents the preferred option from a financial perspective.

It is clear, as long as budgetary concerns remain the primary driver for delivery of capability the current approach to defence procurement lacks long term strategic vision. These decisions, in the recent past, have been based upon ad-hoc political considerations or the application of the Commonwealth Government Procurement Guidelines, which have an extreme focus on obtaining the lowest contract price,[2] seemingly ruling out any conscious industry capability building role for government procurement.





AMWU National Day of Action to Save Shipbuilding July 2015.

## STRATEGIC ENVIRONMENT

Australia's current government by virtue of the challenging strategic environment presented in the Indo-Asia Pacific, combined with broad national interests must make strong decisions on defence policy. These factors continue to make it essential to modernise the Australian Defence Force.[3] Both major political parties have agreed that Australia's future military capabilities will include many elements of Force 2030, yet solid doubt still exists whether this aspirational force will ever be realised. [4] For the majority of doubters, Force 2030 remains an unobtainable mirage due to a disconnect between the increasingly complex strategic environment and insufficient attention paid towards defence policy and funding. Whilst the future Maritime Industry Strategy does not solely hinge upon the interests of defence, it is the government which must recognise the obstacles faced by the industry and attempt to remove them. In order to achieve the force structure required to protect and advance the nation's interests the present governmental approach to the maritime industry and its efforts to support innovation and long term development, are brought into question. Ultimately the realisation that defence capability is greatly enabled through support of defence industry needs to come to the fore front and evolve over time into policy.

From a slightly different perspective but entirely within context, this view is largely supported in a report by the Australian Manufacturing Workers' Union (AMWU) included as a submission to the Defence White paper in 2014. Whilst the majority of AMWU members are primarily based in manufacturing industries, a significant membership includes civilian members within the Department of Defence including each of the armed services and the Defence Materiel Organisation (DMO) and Defence Science and Technology Group (DSTG). It also has members within BAE systems, Thales, Boeing, ASC and Raytheon. The AMWU submission declares that Australia's defence capability cannot be separated from our defence industry capability and goes on to express disappointment that this truth, whilst readily accepted in other countries, is increasingly ignored in Australia. Specifically, the AMWU believes that the shipbuilding situation in Australia, is one of the broader challenges facing the defence sector, namely a lack of strategic planning combined with lapses in capability building and skills investment [5].

## RACE TO THE BOTTOM LINE

Writing for the Australian Strategic Policy Institute, Manager of the the Australian Business Defence Industry Association, Graeme Dunk has expressed his views stating:

Decisions on military acquisitions and support seem to be made on the basis of the balance sheet rather than any deeper consideration of strategic importance. [6]

Probing further following queries regarding how Australia compares with other countries that fancy themselves as middle powers, Dunk rates Australia as "abysmal" in our support for our indigenous defence industry. The inability to recognise the link between local defence industry capability and the mitigation of strategic and sovereign risk remains, and continues to be largely overlooked by policy makers. At the time of this report (2014) it is clear to see that the current approach to defence procurement and decisions made are made solely on a case by case basis, seemingly with no

consideration of the impact of the industry, resulting in a series of random outcomes, such as the Spanish acquisition of the Canberra Class LHD's. If this approach continues, the Australian shipbuilding sector will be led down the "valley of death".[7] In summary, the report by the AMWU as a submission to the 2014 White Paper, and comments by Graeme Dunk state that government procurement guidelines are fundamentally flawed. They fail to take a holistic account of value for money, instead remaining firmly focussed upon cost minimisation to the detriment of indigenous maritime industry.

## FUTURE LESS-IMPERFECT?

Taking a more optimistic tone is possible reviewing recent events. Is it possible the Government is taking a new approach to defence procurement? The recent announcement of Australia's future submarines to be built in Adelaide after French company DCNS won the anticipated \$50 billion contract was heralded by Malcom Turnbull as:



Prime Minister Malcolm Tunbull visiting HMAS ALBATROSS during the 2016 Federal Election Campaign.

[A] great day for our Navy, a great day for Australia's 21st century economy, a great day for the jobs of the future [8].

During a recent tour of Austal shipyard in Western Australia, the newly installed Defence Industry Minister, Christopher Pyne stated that the governments aim with building submarines in Australia was to make the country into a "defence industry hub", making defence industry, as his portfolio would imply, a fundamental input into driving defence capability.[9]



President and General Director of DCNS Herve Gillou and Defence Industry Minister Christopher Pyne at the DCNS Yard Cherbourg Dec 2016 (AFP-Charly Triballeau).

Simply put, does the multi billion submarine contract signal the dawn of new age where the government considers the bigger picture beyond the accounting balance sheet and invests in the defence industry capability required to realise our middle power status ambition?

A further example of the Department of Defence commitment to harnessing the local defence and maritime industrial sector, is the ANZAC Frigate Anti-Ship Missile Defence (ASMD) upgrade being conducted out of the Australian Marine Complex (AMC) at Henderson in Western Australia.

The upgrades which take around 12 months to fully install, followed by an extended period of testing, represent a highly complicated process drawing upon a variety of trades from aluminium welding to fibre optic installations.

Capitalising upon the pool of skilled labour created in WA by the resources boom [10], the Common User Facility and BAE's shipyards at the AMC are considered to be a national asset. The work required for the ANZAC frigate upgrade is complex, employing around 70 public servants and military personnel and up to 250 contractors [11] involved in sustainment of existing vessels and installation and testing of the upgraded capability. In this instance, the AMC represents a successful fusion of Defence and commercial industry, making a positive and lasting impact upon Defence capability. Based upon the continued success of the program, the potential exists for WA to become a destination for additional naval industry work, clearly representing a great opportunity for the local maritime industry. When considering the governments aspirations for Force 2030, without significant continued investment in the existing facilities, and measures to ensure the attraction of a skilled labour force, AMC's and the WA maritime industries grand ambitions to support this future capability could be little more than a pipe dream.

## **RADICAL INNOVATION – EVOLUTION NOT REVOLUTION?**

In another positive sign, on 25 February 2016, Defence announced the emergence of a "once

in a lifetime" change to Defence's approach to industry engagement and innovation.[12] Published by the Defence Industry Policy Division, the "radical" Defence Industry Policy Statement (DIPS) was released in an effort to acknowledge the massive challenge in reshaping industrial policy. With government backing and intent, senior government buy in and through a dynamic framework, DIPS hopes to facilitate business development and innovation nationwide in order to deliver a greater Defence capability with Australian industry as the central provider. In addition, a renewed and solid focus on improving defence engagement with industry [13] and addressing historic shortfalls forms the core of this policy statement.

With an effort from defence to improve the nature of defence and external industry relations and ties, just how in the long term is such a statement set to improve defence capability? In the short term, whilst representing an innovative shift towards defence industrial policy, without significant investment in infrastructure and relaxing of legislative measures, the DIPS will be incapable of solely implementing change in isolation. Just as commercial interests and concerns are linked to defence capability, defence based policy statements form only half of solution without significant contribution from the commercial maritime sector. It is hopeful DIPS will provide a baseline mechanism for future engagement.

## **A PIVOTAL MOMENT?**

In considering Australia's Maritime Industry Strategy, the issues facing individual industries, the policy and legislative context and the future science and technological requirements needed to further maritime industry development must be identified and discussed. At first glance, Australia already has a strong foundation to support the maritime industry: first class marine research capability involving government institutions as well as private sector activity; and the ability to create and sustain a highly skilled and capable workforce.[14] Over the past three years, there are positive signs the government is willing to look beyond the balance sheet and invest in defence industry to enhance overall capability. It's time the government got serious about supporting the defence industrial sector, with a robust response to support the aims of the Defence White paper required. Whilst the recently released DIPS is indicative of steps



Defence Industry Minister Christopher Pyne Welcomes the Italian 'FREMM Class Frigate ITS CARABINIERE (F593) to Adelaide.



Floating Dock at Australian Marine Complex (AMC) Hederson carrying INCAT Catamaran.



in the right direction for sustaining maritime industry capability whilst maintaining defence engagement, more can be done to magnify these measures. For the first time, in a pivotal moment for the nation's manufacturing sector, Australian naval ship builders are about to get a sustainable workload [15]. State governments, federal parliamentarians and defence businesses are all engaged in enthusiastic debate about where the huge procurement projects should be allocated.

At this stage, complexes such as Australian Submarine Corporation in Adelaide, and AMC in Henderson, WA, will reap the immediate benefits. As awareness of the importance of developing and sustaining an indigenous maritime industry capability grows, the continued hope is that it will be eventually matched through updated policy. Without doubt, such a capability, backed by appropriate policy will become a cornerstone for an overall defence strategy and realisation of Australia's role within the region and ability to exert herself as a medium power. ■



HMAS ADELAIDE (L01) and HMAS CANBERRA (L02) fitting out at BAE Systems Williamstown Shipyard circa 2014.

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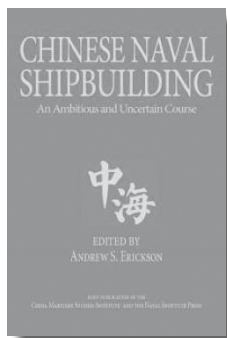
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## Chinese Naval Shipbuilding

### An Ambitious and Uncertain Course

Bernard D. Cole

Naval Institute Press

(15 January, 2017)

ISBN-10: 1682470814 (Hardcover)

ISBN-13: 9781682470817 (Paperback)

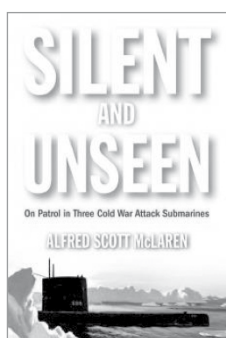
**\$US39.95; \$AS54.50**

This is an important, timely and indeed ambitious book at a pivotal moment in World history. In understanding China's Shipbuilding and Designs one also gains a glimpse into the cultural knowledge, technologies and enduring artefacts necessary to sustain a Navy. It was no accident that the Industrial Revolution had at its core the impetus given by the need to rebuild the Royal British Navy following the Civil Wars; the 1688 Golden Takeover (by the Dutch); the financial crises of the 1690s; and, the 1707 Act of Union. Ship designs, builds and manufacturing that defined British Navy and Industry for the next 300 years.

The enduring nature of both the revolution and the Navy also shaped new means of working and organising resources (Admiralty); new financial models (based upon The Bank of England and the City of London), and significantly impacted the mass movement of peoples across the world – exacerbated by the Irish Potato famine and the Highland Clearances. An industrial revolution of this type could not therefore be sustained without impacting society and the work force (for example the Great Leap Forward that killed millions); which similarly impacted the designs and builds of ships and democratic political organisations alike. For example, the rise of the Unions; the Labour movement, and Sinn Féin (in Ireland).

This raises the fundamental questions addressed by Andrew Erickson in identifying the means by which China is seeking to become a maritime power. It is one thing to build ships – another one entirely to sustain Fleets over time, with supporting structures and organisations necessary to endure. It is here that Erickson's final analysis is most interesting – recognising that, 'ultimately, it is likely to be the ability to rapidly adapt to a changing war-fighting environment that will confer the most long-term advantages'. This ability to adapt is a component of the human software, as Erickson calls it, and is likely to be the critical factor. Just as Kaiser's Germany was essentially entrapped by the Mahanian effort put into building a formidable Blue Water Navy (with

aspirations in the South China Sea), so too may be China. By locking itself into current thinking, just at a moment of significant change – when the Global West moves (as we know is coming) to a new state. Strategic agility, as Erickson also argues, should be the guiding star for all naval planners. This planning, though, and its impact is wider than simply on navies alone. The question for the CCP may be 'what organisations are coming that may augment, overthrow or replace it'? History also shows, this can often come from Navies. A threat for the West may be that over-emboldened by its Navy and facing interstitial threats at home, a weakened China may severely miscalculate. And President Xi Jinping and China, despite Admiral Harry B. Harris's (U.S. Pacific Command) contrary views, may not be as powerful or secure as often portrayed...



## Silent and Unseen

### On Patrol in Three Cold War Attack Submarines

Captain (Dr) Alfred S. McLaren USN (Ret.)

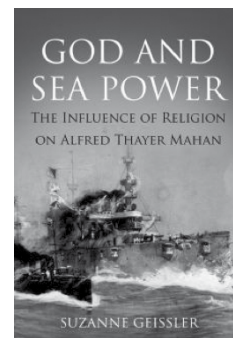
Naval Institute Press (May 15, 2015)

ISBN-10: 1612518451

ISBN-13: 9781612518459

**\$US39.95; \$AS54.50**

This book is about many things, but chiefly it is about engineering and technological leadership and seamanship of the first order in the most existential of environments – with a nuclear reactor at the back-end and an enemy beyond-the-depths, just to add some gist to the mill. This is a humble and humbling book – which perhaps harks back to a lost age of technological exploration and endeavour, when everything seemed so big and so doable. Like putting men on the moon. There is therefore a sense of loss – of lost skills and peoples capable of crewing these vast machines of war – and deterring the Soviet Union from making a strategic miscalculation. There is also a sense that we will not see these types of men and women again, from the Great Generation. Stories such as these though may provide that inspiration for our youngsters and enable them to do other great things, such as commanding the North Pole expedition that completed the first survey of the entire Siberian Continental Shelf. Above all, the lessons for future engineering leaders – including during the Cuban Missile Crisis – are profound and worthy of digesting. McLaren's story should not remain silent.



## God and Sea Power

### The Influence of Religion on Alfred Thayer Mahan

Professor Suzanne Geissler

Naval Institute Press (October 15, 2015)

ISBN-10: 1612518435

ISBN-13: 9781612518435

**\$US39.95; \$AS54.50**

Render therefore unto Caesar the things which are Caesar's; and unto God the things that are God's.

This is undoubtedly an important and somewhat troubling book in its approximation of God with Sea Power, albeit through Mahan's culture, upbringing and beliefs. Yet at the same time, for those of us who have had to confront radical Islam and jihadism over the past two decades, and who also have experience serving at sea – where one can often feel in need of a prayer or two to ride out the tempest – it is possible to recognise the importance of religion on understanding, and upon strategy. It is this understanding and approach that makes Geissler's book so eminently readable. Paraphrasing both Clausewitz and Sun Tzu: 'to know one's enemy, one must first know oneself'. In many regards the West no longer knows itself. It has taken the challenge posed by the long wars of Iraq and Afghanistan – both of which began with Amphibious Assaults from the sea – to bring us back to our senses. To move from fought to thought and to start thinking and strategizing again, so we might better define our enemies, through knowing ourselves. Knowing how the mighty ATM thought and why he approached the problems of the time in the way he did is therefore an important contribution. Interestingly, Mahan's view of Nelson despite his affair with Lady Hamilton and this 'great lapse in judgment', are 'overwhelmingly positive'. This ability to look beyond and to understand that we are not Gods and that beauty lies also in our imperfections is perhaps summed up by the memorial plaque in Quoge Parish Church: '...Great among the nations as an expounder of Sea-Power: Greater in the Kingdom of GOD as an example of a Christian man'. That is probably an epitaph many contemporary leaders would struggle to be given.





# THE NAVY LEAGUE OF AUSTRALIA ANNUAL MARITIME AFFAIRS ESSAY COMPETITION 2017



## TOPICS

- 21st Century Naval Warfare
- Australian Naval History
- Australian Industrial Maritime Strategy

## CATEGORIES

A first, second and third prize will be awarded in each of two categories:

**Professional category**, which covers Journalists, Defence Officials, Academics, Naval Personnel and previous contributors to *THE NAVY*; and **Non-Professional category**.

Essays should be 2,500-3,000 words in length and will be judged on accuracy, content and structure.

## PRIZES

	1ST PLACE	2ND PLACE	3RD PLACE
Professional	\$1,000	\$500	\$250
Non-Professional	\$500	\$200	\$150

Essays should be submitted in Microsoft Word format on disk by;

Post to:

Navy League Essay Competition  
Box 1719 GPO, SYDNEY NSW 2001

OR

Emailed to: [editorthenavy@hotmail.com](mailto:editorthenavy@hotmail.com)

Submissions should include the writer's name, address, telephone and email contacts, and the nominated entry category.

## DEADLINE

**Saturday 26 August 2017**

Prize-winners announced in the January-March 2018 Issue of *THE NAVY*.

# STATEMENT OF POLICY

For the maintenance of the Maritime wellbeing of the nation.

CURRENT AS AT 1 APRIL 2017

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

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

## The Navy League:

- Believes Australia can be defended against attack by other than a major maritime power and that the prime requirement of our defence is an evident ability to control the sea and air space around us and to contribute to defending essential lines of sea and air communication with our allies.
- Supports a continuing strong alliance with the US.
- Supports close relationships with all nations in our general area 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.
- Welcomes the 2016 Defence White Paper and the Government intention to increase maritime preparedness and gradually increase defence expenditure to 2% of GDP.
- 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.
- requirements of our 5 new major warships and the many other essential maritime tasks.
- Recommends bringing forward the start date of the replacement frigate program.
- 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 the increasing tensions and major changes now taking place in international relationships.
- 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.
- Supports the efforts by Navy to rebuild the engineering capability to ensure effective Fleet maintenance and sustainability.
- 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 Naval Reserve and Australian Navy Cadets organisation.
- Advocates a strong focus on conditions of service as an effective means of combating recruitment and retention difficulties.

**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 concept of a Navy capable of effective action in war off both the east and west coasts simultaneously and advocates a gradual build-up of the fleet and its afloat support elements to ensure that, in conjunction with the RAAF, this can be sustained against any force which could be deployed in our general area.
- 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 escort

## The League:

- Calls for a bipartisan political approach to national defence with a commitment to a steady long-term build-up in Australia's defence capability including the required industrial infrastructure.
- While recognising budgetary constraints believes that, given leadership by successive governments, Australia can defend itself in the longer term, within acceptable financial, economic and manpower parameters.





### **HATCH:**

HMAS ADELAIDE (L01) INS CARABINIERE (F593) a SEA5000 contender on PASSEX. The shape of things to Come - LSIS Peter Thompson.



### **MATCH:**

A RAAF P-8A Poseidon AWACS passes NUSHIP HOBART (D39) in the Gulf St Vincent off the coast of Adelaide. CPL Craig Barrett.



### **DISPATCH:**

Decommissioned HMAS TOBRUK (L50) leaves Sydney Cove for the last time (7 Dec 2015) en route to its Viking funeral in Queensland Chris Sattler.





F-35B Lightning II Fly Past (with one on deck) Wasp Class LHD USS BONHOMME RICHARD (LHD-6) Nov 2016 - Shape of things to come.