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AUSTRALIAN NAVAL INSTITUTE

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- · to encourage and promote the advancement of knowledge related to the Navy and the maritime profession; and
- to provide a forum for the exchange of ideas concerning subjects related to the Navy and the maritime profession.

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The Journal of the Australian Naval Institute is published four times a year: at the end of January, April, July and October.

The Editorial Board seeks letters and articles on naval or maritime issues for publication in the *Journal*. Articles concerning operations or administration/policy are of particular interest but we will consider papers on any relevant topic. As much of the RAN's operational and administrative history is poorly recorded, the recollections of members (and others) on these topics are keenly sought.

Back copies of the *Journal* (where held) cost \$5 for members and \$15 for non-members. The Institute will take back old copies of the *Journal* if members no longer wish to hold them.

Pen Names

If a member wishes to publish under a pen name the Editor must be advised either in person or in writing of the identity of the individual that wishes to use the pen name. The Editor will confirm in writing to the member seeking to use a pen name that the name has been registered and can be used. More details are available on the Institute's website.

Style Guide

Articles and correspondence should be submitted electronically in Microsoft Word, with limited formatting. Relevant pictures or maps can be submitted electronically (if under 1 MB), otherwise they should be provided on CD.

Articles may range in size from a few pages to 10+

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A number of members based outside Canberra can provide advice on membership and the development of articles for the *Journal*. Their details can be found on the Institute's website, on the *Journal* page.

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The ANI library is located at Campbell Park Offices (CP4-1-039). The collection, which numbers several hundred books on naval history and strategy, and more general defence matters is being managed by the Sea Power Centre-Australia on the ANI's behalf. By combining resources with the Sea Power Centre's own reference collection, ANI members now have access to an unrivalled and often unique selection of research material. The library is normally available for use 0900-1630 each weekday, but please ring to confirm this before your arrival, particularly if visiting from outside Canberra. As this is a reference collection, it is not possible to borrow the books.

The Institute will gladly accept book donations on naval and maritime matters (where they will either be added to the library or traded for difficult to obtain books).

The contact for access to the library or for book/journal donations is Mr Joe Straczek on (02) 62662641, email jozef, straczek/@defence.gov.au.

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Front Cover: HMAS *Tobruk* alongside Loloho wharf during final logistics wind down for Operation *Bel Isi* in Bougainville (RAN) **Back Cover:** HMA Ships *Voyager, Melbourne* and *Vendetta* (RAN)

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The passing of Rear Admiral Nick Hammond, AO RAN (Rtd)

Vice Admiral Chris Ritchie, AO RAN (Chief of Navy) - It is with great sadness that 1 inform the Navy of the death of RADM Nick Hammond, AO RAN (Rtd) who passed away on Sunday 12 Oct 03.

RADM Hammond joined the Naval College in 1960. During a long naval career as an engineering officer he was extensively involved in defence acquisition, including the management of the guided missile destroyer modernisation and the Australian frigate and *Anzac* ship projects. He retired from the Navy in 1995 as a RADM. He then continued his association with defence by serving as the First Assistant Secretary Defence Material. In 1997 he was appointed Managing Director of SAAB Systems.

RADM Hammond's passing is a great sorrow for the RAN.

Editors Note: RADM Hammond was a long time member of the Institute and provided corporate sponsorship as a Friend of the ANI.

Designing the RAN for the 21st century

Commodore Alan Robertson, RAN (Rtd) - In his article Designing a Modern Navy Admiral Stansfield Turner USN began with the very reasonable statement that, in order to design a modern navy, it was necessary to have an idea of what the navy was supposed to do. Accordingly, he argued that it was necessary to be able to perform one or more of the three seapower missions which make up a complete maritime strategy. And, in his view, a maritime strategy's missions were sea denial, sea assertion and power projection. In the Australian context these would be sea denial, sea control and maritime power projection. The difference is merely one of semantics, the terms are effectively interchangeable. And, whatever the strategic guidance handed down from the government, it is clear that an ability to perform one or more of those three seapower missions must provide the basis for the design to be based on.

But, of course, any proposal for military force structure must be aware of the resources needed to implement the design. The process is as follows:

- (a) Strategic requirement, leading to
 (b) Tactical elements needed to impl
 - Tactical elements needed to implement (a), leading to

(c) Costs of the tactical elements.

And, if (c) comes out as more than the you can reasonably expect the government to provide, then you must go back to (a) and rethink the strategic basis until you can come out with a (c) which is acceptable. But before you do that you can reduce the amount needed by adopting such ideas as the High-Low Mix. In the case of the USN Admiral Turner had in mind the High level CVANs and the 8-10,000 ton destroyers, whereas the Low end would, in his view, consist of the envisaged 18,000 ton Sea Control Ships (STOVL carriers) and the FFGs.

In the late 1970s, observing that the RAN had some FFGs on order, it seemed to me that, for an RAN High-Low mix the FFGs would represent the High end escorts, (though today that is probably the Anzac frigates) and that would mean that our air capable ship would have to be something like Turner's proposed Sea Control Ship. As for the Low end escorts in the RAN context, I believed that the US Coastguard 270' cutter would be a reasonable acquisition. This was based on a cost, in those days, of \$90m a copy, and requiring a crew of only 90. Furthermore, they had obviously been designed to have maximum commonality with USN escorts, in that they were fitted with the same weapons, combat data system, EW equipment etc, but would have only one, not two helicopters. It seemed to me, too, that we needed a proven design to fulfil the roles undertaken by the Bathurst class AMS during WWII, and could be built at any number of yards around the country. The AMS did everything except sweep mines until the end of the war, and they survived in a modern war at sea wherever they were sent.

Today, though, to suggest air capable ships for the RAN is about as popular as farting in church it seems. Ever since the 1980s, when the government of the day decided to do away with fixed wing naval aviation it has become politically incorrect for anyone in the Navy to suggest a need for a renewal of fixed wing at sea. But, how can the RAN perform its sea control function without organic fixed wing? And how can the RAN make an effective contribution to support the Army in maritime power projection without air defence and ground attack fighters?

The immediate reply from the thoroughly brainwashed as a result of the carrier debates of the 1980s, is to say *that's all very well, but it would cost too much.* This is thrown off as a Blinding Glimpse of the Obvious, but, I suggest it is an attitude which is open to very serious question.

The Design to Price philosophy was used in designing the FFGs. So let us set a figure for a carrier and its air group. Assuming a price for such a package ran to \$1.5b and we needed three of them, the total cost of getting back into fixed wing at sea from a ship and aircraft point of view, would be only \$4.5b. Now, observing that the Defence vote over the next twenty years will be of the order of $20 \times $16b = $320b$. In that case \$4.5b would represent only about 1.3% of that amount. And if we cannot budget for such a small amount I would suggest that we should get out of the Defence business altogether.

Can we keep the price down to \$1.5b a copy? I do not see why not. The hull is simply steel and air, reasonably cheap. It then becomes a question of what you put into that hull. If we have kept the DDGs operations room consoles, radars, communications kit, EW outfit, TACAN etc, then that equipment should be available for nothing. If we foolishly decided it wasn't wanted then could we ask the USN if we could buy three secondhand DDGs from their reserve fleet, and cannibalise them?

For engine room plants could we put in two Anzac frigate enginerooms? As for compartments, is it worth considering an idea by the British shipbuilders for the 1970s carrier project, that is, design compartments to go in standard shipping containers, which means you could go out to tender for their construction all around the country. It would also make for easier refits. Of course, hooking them up to be supplied with electricity, water and waste disposal could present some problems. but not, 1 suggest, insurmountable.

One of the most expensive items in shipbuilding costs is cabling. So, as far as internal communications are concerned, could we resurrect an idea I had forty odd years ago, and to which the DSTO applied some design effort? That is, design an integrated internal communications system to carry the ships telephone system, audio and television broadcast using standard terminals (handsets, loudspeakers, and video screens) and running it all round the ship using co-axial cable For damage control purposes it would be necessary to have in each compartment spare lengths of co-ax cable. And we could save ourselves the cost of an internal telephone directory by having a self-evident numbering system eg Captain 001, Exec. 010, Mate of the upper Deck 011, Commander Air 020, Little F 012 etc.

have any merit, but they indicate the sort of things we might do to prevent the sort of Rolls Royce attitude we seem to have taken with regard to the Collins class submarines.

In conclusion, let me reiterate my belief that the RAN of the future needs aircraft carriers if it is to be able to perform the all-important sea control and maritime power projection missions, which are, together with sea denial, its raison détre. And we should not shy away from saying it, out loud and without embarrassment. To get over the unthinking response that aircraft carriers are too dear, let us examine some of the ideas I have put forward. The need is urgent, and it won't go away or be helped by silence on the part of the Navy. At the very least, let us debate the issue in the pages of this *Journal*.

ANI Annual General Meeting 2004

The 2004 Annual General Meeting will be in Russell Offices on 15 March 2004 at 1215. The venue will be the large conference room on level 4 of the Russell 1 building.

For those members who wish to attend but do not have a Defence security pass, please contact Commander Peter Leavy, RAN on (02) 62655005 prior to the 15th to arrange access.

The major item on the Agenda is continuing constitutional reform, updating the Constitution to reflect modern terminology, current practices and to ensure the Constitution conforms to the Act and other ordnances.

Proposed changes to the Constitution are recorded on the Institute's website.

ANI library donations

Thanks to RADM David Campbell, RAN (Rtd) for donating his copies of the *Journal of the Australian Naval Institute* to the ANI library.

was in her air group when she collided with USS rrain L Lians in 120

What caused the Voyager collision? Where did the investigation fail?

Commodore D.S. Ferry, AM RAN (Rtd)

It is forty years since Voyager was sunk on 10 February 1964, and many now serving were not born then. Twelve years ago Dr Tom Frame published his book Where Fate Calls: The HMAS Voyager Tragedy, a compendium on the accident, its investigation and its milieu. I was lent this book recently and became engrossed, took notes and mulled, as so many have. After an exploratory start I came to the conclusion that there was a more cogent explanation of the accident's cause than had been offered previously. Also, while much of the community's impression and memory of the collision stem from the muddled investigation, the origins of this seemed accessible. Even though the manoeuvre Voyager was engaged in and some features of the investigation are in the past, my judgement was that publication of a further analysis could yield benefits for the future. This article is the outcome. It is in two sections, the first on the collision, the second the investigation.

My sources are mostly Where Fate Calls, and the relevant parts of the Reports of the Royal Commissions of Inquiry into the accident.

Background

The accident occurred during night manoeuvres for flying off Jervis Bay. *Melbourne* was steady on course and struck *Voyager* abreast her bridge, on her port side, as she crossed *Melbourne*'s bows, about square with her track. *Voyager* broke in half, the bow section capsizing and sinking a few minutes later. The stern stayed afloat for some hours before sinking. Eighty two men from *Voyager* lost their lives. The rescue was conducted by *Melbourne*, search-and-rescue craft from *Creswell* and *Albatross*-based Wessex helicopters. The seas were benign, winds light and the night moonless.

Melbourne had another collision during night flying manoeuvres five years later, with the destroyer USS Frank E Evans, resulting in a similar loss of life from the destroyer. It was possible to reconstruct the sequence leading to the Evans collision but the cause of the Voyager accident remains conjectural, as there were no survivors from amongst her bridge officers.

A Royal Commission convened in February

1964, to inquire into the collision. It found that Voyager was responsible, in not maintaining a constant and efficient lookout, and that a misunderstood signal might have contributed. It found also that Melbourne should have alerted Voyager to the impending collision. Some politicians took up the cause of Melbourne at the behest of her captain, Captain R.J. Robertson. Subsequently, Lieutenant Commander P Cabban, recently relieved as Voyager's first lieutenant, made a statement intimating that the Voyager captain, Captain D.H. Stevens, had had health problems which interfered with his command responsibilities. A second Royal Commission in 1967 inquired into the statement. It found that Captain Stevens was unfit to command due to ill health and that Voyager's turn which led to the accident was in the mistaken belief that she had been to port of Melbourne when in fact she had been to starboard. The second Commission overturned the finding that Melbourne should have warned Voyager. It found that it was not a signal misunderstanding which induced Voyager's final turn to port.

COLLISION

Voyager was fine on Melbourne's port bow, both on a course of 060, when a Melbourne signal ordered a turn together to port to 020. As Melbourne turned, she sent a flying course signal requiring Voyager to assume the duty of rescue destroyer, in preparation for flying operations. The signal directed the destroyer to planeguard station on Melbourne's port quarter for a flying course of 020. These signals are referred to frequently in this article as the turning signal and the flying course signal.

The evidence is that *Voyager* turned towards 020, briefly turned back to about 065 on receipt of the flying course signal, then reversed into a sweeping port turn, consequently colliding with *Melbourne*. Figure 1 depicts this. It is a simplified and slightly modified version of a reconstruction by Robertson dated 6 May 1964.

Voyager took avoiding action but too late. Melbourne's engines were ordered full astern before the collision but with little effect. At the collision, Melbourne was on a course of 020,

¹ Commodore Ferry served onboard *Voyager* in 1959-60. At the time of this collision he was visiting *Melbourne* and was in her air group when she collided with USS *Frank E Evans* in 1969.

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speed about 21kt. An inspection of *Melbourne*'s damage placed *Voyager*'s course at 280-285, speed 23. Other evidence supports the course though she may have been slower.

Figure 1. THE COLLISION



Captain Robertson's Opinion

While watching *Voyager* after dispatch of the flying course signal, Robertson thought at first her starboard turn was to continue, taking her across *Melbourne*'s wake towards planeguard station. After *Voyager* reversed her turn to port, his reaction was that she had not turned to starboard far enough for her to clear *Melbourne* astern in a fishtail. He therefore assumed she was doing a zigzag, or double fishtail. The turn continued, it becoming evident she was turning too far for that, and he ordered full astern.

Robertson's preferred view later was that *Voyager* had believed herself still to be to port of *Melbourne* after the turn to 020. This, he surmised, would have explained her deciding on a port turn to take up planeguard station after a first reaction to circle to starboard.

An alternative he advanced was that the starboard turn was again to take up plane guard station, *Voyager*'s rudder being reversed during discussion as to whether the flying course signal required action or was for information, port wheel then being left on inadvertently. He felt this less likely because heel would have alerted bridge officers to the continuing turn.

Robertson with others went to some trouble preparing reconstructions for the Commission, which were refined after receiving naval architect's advice and data from Melbourne sea trials. There is conflicting evidence as to courses and speeds from Voyager survivors, many of whom had been subjected to harrowing ordeals, but Robertson was the best placed to resolve the most likely sequence. Frame accepted the general validity of the reconstruction having reviewed the evidence and transcripts. I have no reason to question it except in some minor detail, but I do warn the reader that it remains informed surmise, as it depends on Robertson's recollections and his weighing of evidence. That said, I am unaware of any sensitivity in what follows in this article to the rudder and speeds he attributed. Implicitly, the evidence he accepted was that Voyager did not change selected speed during her turns, having applied 15 degrees of rudder in her starboard turn, then 10 degrees of port in her final port turn.

First Royal Commission

The 1964 Royal Commissioner did not accept the reconstruction, because he had a different view of timings. There was a general difficulty in relating Voyager's movements to the signal sequence, partly because time keeping onboard Melbourne was approximate and partly through difficulties with memory. The Commissioner also did not accept Robertson's preferred theory, as he thought that Stevens' experience made it unlikely. He found instead that Voyager was on a steady course of 270 prior to the collision, inclining to the view that Voyager's final movements were 'a result of the ...turning signal' having been perceived as ordering a course to the west of 020. He noted that 'the operative effect of the last flying course signal is not wholly free from doubt' but that 'the final movement was not induced by the final signal'. As he did not elucidate nor provide a reconstruction, his findings were fragmentary. The second Commission reviewed the timings deduced by the first and found that they were in error. Frame analysed the timings and likewise took issue with them.

The Commissioner's findings have another weakness. He and those assisting during the hearings seem to have quite missed the import of the nature of a turn in company, a signalled turn by definition being in concert with *Melbourne*. Such a turn would be on *Melbourne*'s tactical diameter of 2800 yards. The reader might 7

envisage Figure 1 with about a threefold increase in the diameter of Voyager's sweeping port turn, Voyager's speed being slowed slightly less by the slower turn rate. The turn could not lead to collision. because Voyager would cross Melbourne's track ahead of her on a more acute and forgiving north-westerly course. One could argue that Voyager might have been turning more tightly to port to catch up after the starboard turn, whatever induced that. Cutting the corner would help, but she came too far to port for this to be an explanation. Probably she would have increased speed also, but none of this is within the Commission's findings.

The implication of the nature of the turn seems not to have occurred to the Commission. The flaw is such that its finding, of *Voyager* turning to the west because of the turning signal, can be discounted for this reason alone.

The Commissioner speculated in passing about why it would be that Stevens was apparently distracted at the chart table during some stage of the final port turn and unaware of the developing danger, though without admonition. I will return to this.

Second Royal Commission

The second Royal Commissioners (plural) sought the Naval Board's view of the accident's cause. Though there had been no comprehensive investigation or appraisal by the Navy, its advice was that '*loss of the tactical picture by Voyager*' was the most likely explanation.

The Commissioners found that Voyager's turn to starboard, then to port were induced by the flying course signal, not the turn signal. The Commissioners' supposition was to the effect that a Voyager bridge officer had decided first on a turn to starboard but if this was Stevens, he changed his mind and if not, the initiator was countermanded by Stevens. As mentioned earlier, they found that Voyager continued across Melbourne's bows due to her bridge officers believing they were to her port, and thus they accepted the Robertson preferred theory, advocated by his counsel during hearings. This bridge officers' belief was 'induced by an error of mental judgement or visual observation (in which) there were some circumstances peculiar to Captain Stevens and physical conditions relating to the night ... '. As this Royal Commission drew no direct connection between Stevens' ill health and the cause of the collision, it remains unclear how it arrived at the conclusion that 'circumstances peculiar to Captain Stevens' could be material.

Frame's Theory

Frame discounted the Robertson preferred theory as being inconsistent with Melbourne's navigation lights. He states that her starboard light would have been visible to Voyager throughout the joint turn to port from 060 to 020. The reader will deduce from Figure 1 that in fact she was on Melbourne's port bow during some of this turn. In the Robertson reconstruction. Voyager turned more tightly than Figure 1 indicates, prolonging the exposure to Melbourne's port light, Perhaps Robertson had in mind she might have turned faster than Melbourne for station keeping: she had been to starboard of station and there was evidence taken of corrective action. Still, whichever it was, the light certainly should have been visible during Voyager's final port turn. Frame found it difficult to accept a theory of wheel inadvertently being left on, for the reason advanced earlier, that ship heel would have been obvious.

Frame indicated the findings of the second Royal Commission suffered the same flaw as the Robertson theory: *Voyager* would have had ample view of *Melbourne*'s starboard light not to be deceived she was to port.

The alternative he advocated was that Voyager believed she had been ordered onto a course to the west, though not by the turn signal. His preference to account for this had been advanced during hearings of the first Royal Commission. It entails possible reversal on Voyager's bridge of the words foxtrot and corpen in the flying course signal. This evidently would have transposed the signal's intent from ordering Voyager to planeguard station to a turn together with Melbourne to the flying course. There, Voyager would be on Melbourne's starboard quarter, awaiting a further signal to reposition her to planeguard station, to Melbourne's port. A second mix-up in the same signal would have the 020 course relayed on Voyager's bridge as 200 or 220.

Frame explained *Voyager*'s initial turn to starboard by suggesting this was the Officer of the Watch (OOW) effecting a course to plane guard station for the westerly course, not understanding the import of the hypothetical *foxtrot/corpen* transposition. He supposed a countermanding by Stevens, who would have expected a further signal to follow, to execute the requirement for *Voyager* to move to her planeguard station. He expressed his belief that Stevens was at the chart table confirming the meaning of the transposition and in so doing was distracted from monitoring the turn. There had been evidence from the tactical operator on *Voyager*'s bridge that Stevens and the yeoman had been at the chart table during the final turn, discussing a signal.

Frame's theory is also supported by further evidence originating from the tactical operator, conveying his impression that while *Voyager* had turned, *Melbourne* had not. *Where Fate Calls* contains supporting diagrams illustrating the feasibility of this explanation. Frame pointed out that *Voyager* would have found continuing observation of *Melbourne*'s starboard light consistent with *Melbourne* turning to port.

Problems with his theory are:

- Voyager's initial turn to starboard was to about 065, a turn of approximately 45 degrees according to Robertson, and it is unclear why Stevens would not have reversed this turn earlier. A possible explanation is that the yeoman or navigator raised the issue of *corpen/foxtrot* and after discussion Stevens concurred, but this does not sit well with him continuing to consult a tactical manual as a priority and allowing the turn to continue while he was uncertain she should be turning at all.
- Such an error would require two coincident and undetected mistakes with the signal, though the yeoman was supervising on the bridge.
- Captain Stevens might also wonder why Melbourne would not have used a simple turn signal?
- Where Fate Calls cites corroborated evidence attesting that Voyager's final turn to port was tight enough to cause noticeable heel. This is consistent with a turn to take up plane guard station. Were it tightened to make up ground after a wrong initial starboard turn, as Frame speculated, it is more likely this would have been by speed increase, for with the tighter turn she would still have fallen short of station by my estimation, even allowing for Voyager's speed to creep up as she straightened. His book contains no evidence of a selected speed increase. Besides, a tighter turn would have increased the monitoring of for close incentive Melbourne's course, for station keeping purposes, increasing the likelihood of early detection that there was a problem.
- It is unlikely that *Melbourne*'s rapid closure would not have clashed earlier with the OOW's expectations than it seemed to, judging by *Voyager*'s very late emergency helm and engine orders.
- Communicators would need to confirm Corpen Foxtrot 220 would not call for a turn to starboard to 200/220, not to port, prompting instant interrogation

In short, the theory has the merit of explaining how *Voyager* turned to port when in *Melbourne*'s starboard arc, but the weight of problems with it lead to it being unsustainable.

Other signal mix-ups and courses to the west canvassed by Frame included mistakes in the relay of the courses in both the turn and flying course signals, again resulting in Voyager turning to the south west. This possibility was advanced by the naval adviser to the first Royal Commission. The naval adviser also put an alternative, that being a mistake with one signal supplemented by Voyager inadvertently leaving helm applied. Further, he raised the possibility that helm had been left on, or the ship left swinging, after the turn from 060 to 020. None, Frame related, was put with conviction, presumably because the coincidence of two mistakes was improbable as was the others remaining undetected.

Lights

At this point *Melbourne*'s lighting intrudes. She was partially darkened and her navigation lights were dimmed. *Melbourne* estimated that they were visible for a mile, nevertheless. Two thirds of a mile separated the ships, *Voyager* on station. *Where Fate Calls* has a diagram depicting the limit of light visibility at 500 yards, though its origin is undisclosed. *Voyager*'s lights were undimmed and clearly visible to *Melbourne*. She was generally undarkened. Robertson described *Voyager*'s side as visible as she turned to starboard when about 1350 yards distant.

Melbourne had just been rigged with experimental red floodlighting of her flight deck. This had been checked as not shining to starboard the weekend before the collision by her navigator. Frame recounted that the lights were adjusted forward after a pilot indicated they were dazzling during night landings, but the pilot he quoted (Commodore T.A. Dadswell) has told me he does not recall saying this, and he could not have, as he made no night approaches with the lights installed. Frame also states that the night of the accident was the first use of the lights. The sequence is important, a possibility being that the earlier check had been nullified. There was deck landing practice to within half an hour of the collision, but apparently the senior pilot then participating knows nothing of this.

What adds to confusion about these lights is a letter from (then Lieutenant) Albert Riley in the 11 October 2003 Sydney Morning Herald 'Good Weekend Magazine'. He said as co-pilot of the Wessex that flew Royal Commission members across Melbourne's bows at bridge height in a

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night re-enactment, only a red light could be seen from Melbourne's darkened starboard bow. The Report of the first Royal Commission notes there was a visit to Melbourne on 19 May 1964, during which Commission members observed landing 'touch and goes' and a destroyer taking up planeguard station. There is no mention of the lights. In a subsequent letter to me, Riley conveys his suspicion that while he attempted to point out the red light, he doubted the passengers were looking in the right direction or knew what they were looking at. In a Wessex, the pilots and passengers were in separate compartments, with smaller windows for the passengers. Only one passenger had headphones and Riley could get no response from him. He said that they were flying at 90 feet at night and their attention might have been elsewhere.

While there might have been a different impression at height and distance in calm waters than in the earlier sea level check, there is no indication from its findings that the first Commission found the lights relevant. The second Commission's report mentions Robertson's counsel having raised these lights during its hearings. His view was supported by the Naval Board in a letter which said 'one of the most plausible theories involves a false appreciation of the situation on the bridge of Voyager; possibly because of a red light shining to starboard ...', the light in question being a floodlight. The Commission indicated that it was possible this could be taken as Melbourne's port navigation light. It neither implicitly nor explicitly ruled in or out whether this light contributed to its finding that Voyager believed herself to port of Melbourne.

Other Hypotheses

Obviously a possible deception by these lights would alleviate the blame on *Voyager* and make more explicable why she would turn to port for planeguard station. It would not of itself explain the turn to starboard.

That could be explained were a signal corruption onboard *Voyager* be seen to require a 070 flying course, the corruption emanating from *Melbourne*'s '07' call sign. This, in conjunction with a deception by *Melbourne's* lights, or the lights being invisible, might lead *Voyager* to believe *Melbourne* had turned from 060 to 070 when *Voyager* had thought she had ordered the 020 turn. This might have caused *Voyager* to turn back promptly to 070 (the starboard turn) before deciding on a port circle to plane guard station for the 070 course. A reproduction confirms a port circle would have placed her about in plane guard

station for that course, though a fishtail would have been a more likely choice, and *Melbourne*'s approach would have given early signs there was an error. Deception by the floodlights could lead to other permutations also. These theories, however, run counter to the statement provided by *Voyager*'s tactical operator as to the signals he recalls receiving.

As to whether or not the lights are germane, Frame advanced the view that *Voyager* had had ample opportunity earlier to observe and notify *Melbourne* of distraction by the floodlights. A quarter of an hour before, *Voyager* had been on *Melbourne*'s starboard bow during a turn from the south. Evidently Robertson had instructed that *Voyager* be warned of their use. I tend to agree with Frame, but in any case prefer an alternative theory that sidelines their relevance.

The Theories So Far

I have given a view of the first Royal Commission findings. My perspective of the Robertson preferred theory and that of the second Royal Commission is to note that Voyager had on her bridge three and up to four seamen qualified to be OOW, were the navigator and first lieutenant included. The first lieutenant arrived at a late stage: the navigator was there throughout. There was also an assistant OOW. Voyager had been fine, about 20 degrees, on Melbourne's port bow and the turning signal required them to turn together 40 degrees to port. Twenty minus forty equals minus twenty. How could any Voyager bridge officer believe after such a turn that she would be to port still of Melbourne's track? The geometry is simple enough. It is incredible, irrespective of the lights. Were the lights misleading there would at least have been discussion, leading, one supposes. to a clarification. It is unimaginable that even should one of her officers been mistaken, others would have acquiesced in a manoeuvre which they would have known to be from starboard, would take Voyager across Melbourne's bows and was manifestly dangerous. There would have been a high level of attention and great concern. Certainly Melbourne was astern of Voyager at the time the starboard turn was decided and then the final port turn, possibly in funnel haze and probably in her radar blind spot; and the evidence is that Melbourne, if not Voyager, was still swinging to 020 when the flying course signal was relayed. This would complicate the scene but the assessment of which side of Melbourne's track she would finish on after the turn remains simple.

Thus I invite the reader also to conclude that Voyager almost certainly knew she would be to

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starboard of *Melbourne*'s 020 track after *Melbourne* turned to 020. The deception by lights is relevant only if there were a coincident signal mix-up, the coincidence of misleading lights remaining undetected and the signal mix-up making this unlikely.

Some other conjectures which have been advanced are encompassed variously by the above contentions and evidence. There are others still, but we must draw the line at the more likely.

New Hypothesis

To me the focal point is the Voyager OOW. There is no direct evidence of where his attention was except towards the end of the manoeuvre. He may have kept Melbourne under surveillance from the pelorus, or attempted to ascertain her inclination using bridge radar. He was unseen by the port lookout until towards the collision. He was a senior lieutenant and experienced watchkeeper. his experience including minesweeper manoeuvring. Evidence during hearings was that at a late stage he was observed by the port lookout to have his binoculars on Melbourne. Robertson commented that the OOW would have gone harda-starboard rather than looking through binoculars had he found Melbourne on her port bow unexpectedly. I contend also that since he would have seen her lights with a naked eye, he was attempting to ascertain her relative course, with Voyager swinging. Some have raised whether he saw himself as a bystander, believing Stevens had assumed control earlier. Were this so it is unlikely such a belief would not have been dispelled during the duration of the turn, supposing the captain was at the chart table as reported; at least for some of the time. Even should the OOW have been rebuked earlier, let us say, or not felt any ownership of the turn, it is unlikely that he would not be alert should he have had doubts about it, and later alarmed, assuming Melbourne's inclination was apparent to him. Instead, the port lookout found it necessary to draw his attention to the danger. This suggests he and others were confident in Voyager's movements to that point, or that he could not pick Melbourne's direction. Robertson commented how difficult it was to ascertain ship inclination on a moonless night. He said he had mistaken Voyager's during her final port turn. One quote from him was it was a sudden realisation in fact that he was right around that way (to port, well past north), whereas up to that moment I had him in my assessment as going away or at least turning away at that time. In other words it suddenly became evident to him that she had turned towards Melhourne when he thought she was

turning away.

Others have given warning of the particular difficulty in ascertaining a carrier's aspect in these conditions. Where Fate calls quotes a Royal Navy Far East Fleet signal subsequent to this accident, which reminded commanding officers that 'it is exceptionally difficult to judge inclination and varying rate of turn of a carrier' and that 'the large number of red lights on a carrier are confusing'. Melbourne was darkened, had no silhouette but carried a variety of required lights. Side lights reduce the possibilities in a vessel's course only to 1121/2 degrees, almost a third of a circle. I think it reasonable to assume that during much of Voyager's final port turn, Melbourne's starboard light and approach were where and what the OOW expected generally. As Frame related, one minute prior to the collision Voyager was half a mile away. It is quite possible she was becoming alert to hazard at about this time. She was on a collision turn, not course. Her turn rate, from her heel, revealed that her intention was to assume plane guard position, that is 20 degrees on Melbourne's port quarter, 1000-1500 yards clear. Plainly she was actioning the flying course signal.

However it was that Stevens was alerted, and possibly it was by the alarmed port lookout, he might have needed to regain night vision. Incredulity might have demanded momentary confirmation of the predicament, followed by a decision as to what action to take, then of course a delay in helm response. The OOW passed or gave the emergency helm and engine orders. The port lookout recounted that the OOW lowered his binoculars and ordered 'full ahead both engines', and perhaps it was this that alerted Stevens.

The following possibility seems not to have been aired hitherto. Figure 2, illustrative only, indicates what I am supposing *Voyager* had in mind: a fishtail. It depicts *Voyager* taking her turn to starboard an arbitrary 25 degrees further than she did and compares this with her fatal track. The starboard turn now can be explained as seeking the necessary room. Maintaining speed would be consistent with her need to make station promptly, with aircraft already on the way, although a speed reduction would have been more normal. A full circle to starboard would have had her behind station.

It is possible that Stevens was confirming at the chart table that the flying course signal had been actioned, and was meanwhile relying on his OOW to monitor the manoeuvre. While Robertson, who had been a communications specialist, obviously was of this opinion, it was a subject raised after the collision.

Where was the misjudgment? Was it that she

did not alter far enough to starboard, or did not hold her elected starboard course for long enough, or was it that she should have slowed or perhaps used more rudder?

Figure 2. WHAT YOYAGER HAD IN MIND (and full starboard turn alternative)



O Collision Position

Notice that at the time of her turn to port, Melbourne was on Voyager's starboard side. This, with a red light visible from Melbourne, might have influenced the second Royal Commission towards its wrong side theory, discounted earlier. This theory will be raised again, but assuming for the moment she was well aware of where she was and given that Melbourne's starboard light was visible, there might have been a visual illusion still, giving her the impression she was behind Melhourne's beam, spurring her to turn to port at that point. Possibly relevant was the assessment by Stevens' superior a month before: 'He handles his ship well but his movements in company sometimes show more impetuosity than judgement'. Robertson commented that he had noticed that Voyager had not turned enough to starboard for such a fishtail; implicitly then he would not have been greatly surprised had she turned further and entered this manoeuvre from there. In fact he described it as 'a normal method of changing station in the circumstances'. Frame attributed the description unseamanlike, in deprecation of a fishtail, to both Robertson and the then fleet admiral. It is apparent from a careful reading of the second Royal Commission's Report that they were alluding to a zigzag, or double fishtail. Figure 2 suggests that had *Voyager* turned the further 25 degrees she could have cleared *Melbourne* astern by over ¼ mile, even without holding her course to starboard longer, turning more tightly or slowing. The turns and speeds in Figure 2 would have positioned her in her plane guard station as she reached position Y, in minimum time.

Assuming Figure 2 to be about right, the bearing of *Melbourne* is shown in the early part of the intended turn to port as about 240 degrees. Further into the turn the bearing would have increased to 263, and the increase would continue. In contrast, in the fatal turn, using the same arbitrary *Melbourne* positions, the initial bearing of 236 degrees would have altered little, to 237. This would have raised concern. A confirmatory check would have disclosed that the bearing was decreasing, galvanising the OOW and any other observers to assess *Melbourne*'s inclination urgently. But time was too short. Note that at the earlier stages of the turn there would be no indication she had turned too early.

the reader are familiar, While you diagrammatically, with some of the bearings and turns, please contemplate the expectations of her bridge officers, were they of the belief she was to port of Melbourne at the start of the port turn. A compass bearing at that stage would be incomprehensible and would quickly disabuse them. Even were such a bearing used just as a datum, the initial rate of bearing change would be much lower than they would have expected, giving warning in itself. Were no bearings taken, consider now the imaginary case that she supposed she started a port turn 1300 yards dead ahead of Melbourne, as aired by the second Royal Commission. A full circle for planeguard would leave her well behind station, even were the last half tightened. Deceived or not she would be unlikely to opt for this. A fishtail would work, but this would entail her reversing wheel to starboard after about a quarter of a circle to port. However, she had turned about 150 degrees to port at the time of the collision. This again renders her manoeuvre inconsistent with a belief she was to port of Melbourne. It buttresses the earlier reason for discounting the Robertson preferred theory and the associated second Royal Commission finding.

In summary, the initial starboard turn is explained as one needed to attain room for a turn to port to cross *Melbourne*'s track astern. This hypothesis explains why *Melbourne*'s approach 7

might have been within the OOW's general expectations. It does not invoke corruption of a signal or a double coincidence. It accommodates absence of reported rancour on the bridge.

Thus the failure by *Voyager* may have been one of judgement in the first place, followed by an inability of the OOW to make out *Melbourne*'s inclination in time, despite the port lookout having noticed the danger. Possibly, he may have developed doubts earlier but was unable to narrow down *Melbourne's* inclination enough to know whether to go to port or starboard.

It is possible also that the OOW was aware of the danger early and was unsuccessful in persuading Stevens of it, or drawing his attention to it, but both would imply that the navigator and first-lieutenant were by-standers or pre-occupied.

A perception of the *Voyager* tactical operator that *Melbourne* was still on a course of 060 may have been the reason for his belief that *Melbourne* had not turned but should have.

It is evident that no personal circumstances of Stevens need be implicated. From the Report of the second Royal Commission, he suffered from a long standing ulcer condition and had been hospitalised for this some years earlier. His peers were aware generally of his discomfort but he was able to conceal the effects of a recurrence in the previous year formally from the Navy; otherwise he might have lost his command. The Commission found that this warranted posthumous censure of him on moral grounds. Occasionally he drank too much. His condition seems to have affected his reaction to moderate drinking, and may have been worsened during a demanding social round abroad some eight months earlier. Alcohol apparently alleviated his ulcer discomfort. There was evidence he was served with a triple brandy the night of the collision, though Cabban had no experience of him earlier drinking at sea. The second Royal Commission was thorough in its investigation of this. It had grounds for doubting that a triple brandy was served that night and noted that his autopsy did not conclude he had consumed any alcohol. The Commission found 'beyond doubt that any suggestion that his faculties or judgement were in any way impaired by alcohol at the time of the collision is positively excluded'.

The mistake could have been instigated by Stevens, the OOW or the navigator and possibly was corporate, noting the evident confidence in it. It was a mistake under circumstances where, to recapitulate, *Melbourne* was astern, both the ships probably were swinging, and at the time *Voyager* decided to enter what was her final port turn, *Melbourne* was on her starboard quarter. Obviously they would have been unaware of the twenty five degrees or so shortfall, but one might expect that a decision to turn then might have led to a careful subsequent monitoring by both Captain and OOW. Perhaps there was, though unsuccessful.

Between danger and catastrophe insert luck. Had *Voyager* arrived at the collision site 25 seconds later, or 6 seconds earlier, there would have been no collision.

I think it is useful to repeat in fuller form an extract of a finding of the second Commission which I truncated earlier.

The mistaken belief (Voyager was to port of Melbourne) was induced by an error of mental judgement or visual observation (in which) there were some circumstances peculiar to Captain Stevens and physical conditions relating to the night, the darkened carrier and its appearance during the final changes of course common to all three (sic) officers on the bridge of Voyager which, along with the capacity of all persons for human error, could, in our opinion, account for the error.

Putting the reference to Stevens and specifics aside, the tenor of the finding remains salient.

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Variation

There is a variation to the alternative I have advanced, which is that *Voyager* understood the turn signal to require a joint turn more to the north or west. In this case the manoeuvre she responded with to this and the flying course signal would have cleared *Melbourne* more amply. Figure 3 shows the outcome supposing her to have understood the course after turning to be 000.

A full starboard turn here still would have put her behind station. This misunderstanding of the turn signal would have added complexity to planning her next manoeuvre. Stevens' discussion at the chart table with the yeoman, at which the navigator may have been present, might have included the signals and the planning. (The second Commission received new evidence that Stevens had a task of deciphering an unrelated priority signal, though this is unlikely to have engaged his attention at that stage). He would have interpreted the 020 flying course signal as directing Voyager to planeguard station, again 1000-1500 yards from Melbourne, 20 degrees on her flying course port quarter, such that Melbourne was bearing 040, and relatively green 40. This would be in anticipation of a subsequent signal ordering a turn together to 020 for flying, after which Melbourne's relative bearing would be green 20. As Figure 3 illustrates, Voyager's

timing of her turns would not be a misjudgment in this case.



Figure 3. EFFECT OF SIGNAL MISUNDERSTANDING

O Collision Position

The course after turning could also have been misunderstood as 270. Stevens most likely would have queried a turn to a course to the south, to 220 say, yet another of the possible corruption combinations, because a port turn would have been in the wrong direction from 060. He may well have been puzzled at a turn to 000 and querulous of one to 270 which might have appeared out of context with the wind having swung to the north, though it was light. The 270 turn has been added to Figure 3, to illustrate it.

The probability of this variation is reduced by the second Commission's conclusion that *Voyager's* bridge loudspeaker, which broadcasted tactical net signals, was functioning satisfactorily and that the bridge officers could monitor the signals. The functioning of the loudspeaker had been put in doubt in some evidence before the first Commission.

Please note that the distinction between this misunderstood signal theory and those advanced at the first Royal Commission, and by Frame, is that it explains the tightness of the port turn while being the result of a single signal corruption. It remains consistent with the impression of *Voyager*'s tactical operator that *Melbourne* had

The possibility of *Voyager* perceiving a 270 turn signal together with a 020 flying course signal was discounted by the second Royal Commission, on the assumption it immediately would have called for explanation from *Voyager*. However, what the Commission may have believed was that the courses in the signals necessarily had to be coincident, while my understanding is that a non-coincidence can be interpreted as I have above.

Other Issues

As to the level of attention onboard Voyager, were Captain Stevens confident in his manoeuvre he might have found resolution of Melbourne's signals a high enough priority to take his direct attention. Evidently he delegated ship handling more than was usual. Robertson believed that Stevens may have left the handling to the OOW. The reader might like to bear in mind that while there was not the same responsibility to avoid collision onboard Melbourne, her navigator was, at one time during this manoeuvre, consulting an anemometer about wind for flying and her OOW was on her port wing as part of his responsibility to keep a general lookout, in other words the two were meeting other normal functions. There is no evidence that Voyager was or was not maintaining a proper lookout, just supposition that she cannot have been. To reiterate, the darkness, darkened ship and general difficulty with interpreting a carrier's direction may have contributed to the lookout being ineffective. It is possible that all officers on the bridge were party to the manoeuvre. There is insufficient evidence to know the extent of the failure of the lookout, but the disparity between observations during the final turn and those expected during a fishtail is a deal less than would arise from, for example, her turning when believing herself to be to port. The first Royal Commissioner found that 'a constant and efficient watch' would have provided adequate warning to obviate a collision or lessen its effects. It is conceivable that it was not so much the lookout that failed but that the consequent response was too slow.

There remains the question whether Robertson's flying course signal was unclear in its method of execution, or was premature. The Naval Board adjudged the signal to be clear, in response to a retired admiral's questioning of it. Robertson seems to have come to the view that the flying course signal was sent with *Melbourne*, or both ships, still swinging: although his earlier reports of the accident describe both vessels as steadied on 020. It does seem possible that a flying course signal directing *Voyager* to change station, while the turn was in progress, might have increased *Voyager*'s difficulty with her manoeuvres.

Also, there are some opinions recounted in *Where Fate Calls* to the effect that *Melbourne* could have positioned *Voyager* astern during turns, and that had she been astern she would not have been exposed to the error. However, none of this was raised by the first Royal Commission as bearing on the cause of the collision.

Collision Cause

In the choice between a misjudgment and a signal misunderstanding, my observation is that both the signal system and bridge officers were seasoned but the signal system was under no particular pressure or difficult circumstances. By far the more likely, the collision was caused by *Voyager*'s gross mistake in not gaining enough room to starboard to complete an intended fishtail manoeuvre safely. Contributing, was her inability to discern *Melbourne*'s course in time to avoid the collision. Fortune did not help.

INVESTIGATION

Frame pointed out that the reason the 1964 Royal Commission of Inquiry was appointed was that the Navy did not have the requisite investigative structure in place at the time, though it could have, should have, and now does. He describes how the Prime Minister had ordered the drawing up of regulations for a naval court, to be headed by a judge, after a naval accident in 1950. He had been Prime Minister also at that time, some 14 years previously. Initial Navy misgivings about this were overcome but a few months later the Secretary of the Navy informed the Parliamentary Draftsman that the Navy Minister had decided not to proceed with the regulations, for a reason as yet undisclosed. The Prime Minister envisaged, in his first announcements after the collision, that the regulations were in place. When this was found not to be so, the appointment of a Royal Commissioner was a substitute. A conventional naval board of inquiry was, to the Government, inappropriate given the magnitude of the tragedy. and the public mood was acrimonious, this disaster following a series of naval accidents in the years leading to the collision. There may have been similar inhibitions in the Navy about setting up an unsolicited investigation. Such a step might have been seen as unwise, though in retrospect it would have been courageous and would have allowed a more comprehensive and thorough naval contribution.

To digress briefly: some have believed that the

Had what is now a naval court of inquiry been convened, most probably it would have employed the services of a judge, assisted by two naval assessors. My expectation is that there would have been two principal differences in its deliberations to those of the Royal Commission:

- Its terms of reference would have included the standard phrase 'make recommendations to prevent recurrence'. The Navy was not consulted in setting the Royal Commission's terms of reference and the Commission was not charged with this.
- It would have applied, or obtained access to, more extensive accident investigation expertise than did the Royal Commission. The Commission could have sought the assistance of a naval investigation into the accident, or the services of more accident investigation expertise from other sources, though it did obtain some external advice on impact velocities. Perhaps it perceived the naval advisers appointed to it were enough, but they seem not to have been integrated by its Leading Counsel.

A naval court of inquiry's findings would have been scrutinised by those with the naval and legal skills, rather than by cabinet and parliament, where such work was submerged in the broad review of what was wrong with the Navy, following the earlier series of accidents. There systematic review of the Royal was no Commission findings, though there was the adhoc parliamentary process that eventually led to the second Royal Commission. The criticism and censure by the first Royal Commission of Melbourne officers, which included her navigator and OOW, could be taken as implying they might have contributed in some way to the collision. Frame wrote that they were not tried by courtmartial as it was adjudged that no charges would be upheld, so a court-martial would have been perceived as a whitewash. Also, the Prime Minister indicated that a Royal Commission's evidence was inadmissible at a court-martial. though one supposes that some, at least, might have been retaken. The problem is that if there is no avenue of appeal against an Inquiry's findings, its criticisms are permanent. A review, however, can decline to uphold them should serious

criticisms not lead to charges.

Naval advice to the first Royal Commission was that the collision was inexplicable. There had been no investigation, but there had been work behind the scenes and it is possible that this would have been the conclusion of a naval court also. Even so, its findings as to cause most likely would have included detailed and developed speculations as to possibilities. The Royal Commission was inhibited by the lawyers' practice of taking particular care with speculation, despite this being a Royal Commission and not a court. Its Leading Counsel Assisting was adversarial and unnecessarily provoked publicity which was damaging to reputations and the Navy, Frame described how the Prime Minister attempted, to intervene, unsuccessfully. The Leading Counsel's reputation was as a cross examiner. He had been recommended by Sir Garfield Barwick, then the External Affairs Minister, presumably for fear that otherwise the Commission might be seen as a vehicle for a Navy cover-up. It might have been expecting too much prescience for him to anticipate that finding the accident cause would be the problem. The Leading Counsel's skills proved to be unsuited and the motivation of other counsels was defence of their client's interests. The 1964 Royal Commission is an example of how such bodies are not always suited to finding facts, though the second Commission belies this as a general thesis. Its investigations into other than the collision cause were thorough and the cause was not its centrepiece.

The 1964 Royal Commission focused on blame and its attribution. Its recommendations for corrective steps were implicit only, though this might have been due to its terms of reference. A comprehensive review and correction of relevant deficiencies might have salvaged more from the wreckage of this accident, principally its loss of life, injury and bereavement, than was realised at the time.

A naval court of inquiry would have concentrated on cause and would have yielded an explicit and detailed listing of what corrective steps should be taken. It might have had the following types of thoughts to ponder on, during its deliberations:

- Internal combustion engines such as diesels and gas turbines, react faster than steam turbines. With gas turbines and controllable pitch propellers, frigates now can stop in three ship lengths from full speed. Obviously, safety in manoeuvring is enhanced with such engines.
- Extra steaming lights subsequently were added to help with inclination assessment of

some ships, but would displacing navigation lights further from steaming lights, or a strobe/sector light concept, have helped with establishing inclination of vessels at night, by refining the large arcs of navigation lights?

- Was there a case for data recorders (including helm) and voice recorders (including tactical net) for accident/incident reconstruction; and ship data transfer, such as course and speed, for prevention?
- Evidence emerged of numerous collisions and near collisions in the RAN and other navies, many unreported. Was the reporting system blame orientated? Should the culture have been changed so that increased reporting might help all learn from others' mistakes and experiences?
- Rescue operations might have been reviewed in the context of the calm seas, proximity to Creswell search-and-rescue craft and Abatross helicopters. and bulkhead containment of the penetration of Melbourne's hull. Voyager's mistake could have had even worse consequences had she arrived ten seconds later. Captain J.P. Stevenson, Melbourne's captain when she collided with Evans, noted that with different Evans could have penetrated timing Melbourne's aviation fuel tanks (she was carrying aviation gasoline at that time).
- Were fishtails unseamanlike, like the double fishtail, when initiated forward of the beam and should their use have been inhibited?
- What should the required manning level on bridges have been during night manoeuvring? What was the level of expectation of an OOW, given that he may be called on to interpret signals and tactical manuals, con the ship, keep a good lookout on radar and determine the courses of other ships in the vicinity, equipment occasionally failing meanwhile?
- The Voyager OOW reportedly had not been to sea for two years. Should there have been a currency limit to a watchkeeping certificate, for night manoeuvres? What should have been the *night* eyesight tests and spatial skills required of OOW's and commanding officers?
- What recommendations should have been made to expand manoeuvring instructions, and about the concept espoused by the fleet commander that there may be like times when a manoeuvring escort should be given warning? His comment had been the basis for the Royal Commission's criticism of Robertson and he was not alone in his view.

A book by Vice Admiral Hickling, *Postscript* to Voyager, indicates the Naval Board shared it.

What might not have been put before a naval court at all was the relevance of international law for the prevention of collision at sea. A matter of interest from the 1964 Royal Commissioner's preoccupation with this was whether it was the responsibility of a commanding officer to interpret compliance with international regulations directly, as distinct from working to naval instructions interpreting them. For warship manoeuvres, perhaps this remains moot still?

Criticisms

Presumably there would have been, and would be now, an adequate means available to Robertson for defence against any adverse finding by a Navy court of inquiry, in the event he needed this.

I would imagine that any serious criticism which stood after review of its findings would have led to trial by court-martial. There is no reason why this could not have led to a clear and just outcome, with the proviso that breaches of good practice and convention do not necessarily lend themselves to charges. However, by facilitating a court-martial, quite probably a naval court of inquiry would have saved the long and public campaign by him and his supporters to overturn the Royal Commission's criticism.

It is uncertain whether Captain Stevens' health and drinking habits would have emerged from the evidence then offering, which included that of Cabban and Stevens' steward. The 1964 Royal Commission did not take Cabban's evidence, because it could see no connection between it and the cause of the collision, but a naval court of inquiry might have. This would depend on the terms of reference, which could have included the conventional 'investigation of the circumstances surrounding the collision', and the nuances of surrounding. The Royal Commission was charged with '...relating to the collision. Under a naval inquiry, these issues might have realised less prominence than they did, since they were immaterial to the cause of the accident, but had they been taken they may yet have prompted reviews of fitness-for-sea-service examinations and reports, and fleet drinking practices. What a naval court of inquiry would have found difficult to replicate was the thoroughness, by the second Royal Commission, of the assessment of the evidence about the triple brandy.

General Consequences

After such a naval court of inquiry, the Cabban statement would have been unborn and the second

Royal Commission unnecessary.

There might have been a more productive next few years in the Navy in implementing fruitful change than was then realised. It might well have regained public confidence earlier than advent of the second Royal commission allowed. Parliament and press would have been spared what appeared to be scapegoating of Robertson, who had resigned without a pension on receiving an unacceptable posting; and of Cabban, whose statement the Navy had resisted (chiefly as having no connection to the collision). This might have fostered in them a more balanced outlook.

Investigation Summary

Thus the added stresses on survivors and the families of the dead, and the load on the body politic and Navy, which resulted from the investigation into the collision, may not have had their source in the work of the Royal Commissions. Neither might it have been Stevens' health and drinking habits, nor a Navy cover-up; but instead the Navy Minister deciding not to proceed with regulations for naval courts of inquiry, ordered years before the accident. This was the genesis of a serious, damaging and unnecessary train of consequences. While not spectacular, it was pivotal.

The failings of the Royal Commissions and the stresses they caused might have been alleviated had the Navy been consulted as to the terms of reference for the 1964 Royal Commission, and been invited to conduct an investigation into the accident, or chosen to. The Royal Commissions, mostly 1964's, would have derived more secure and useful findings as to cause had they sought access to more accident investigation expertise and used it, and had the 1964 Commission concentrated less on blame.

The Amphibious Ready Group in Australian maritime strategy

Lieutenant Commander Arnaud Ng, RAN

From time immemorial the purpose of the navy has been to determine or influence, and sometimes decide, issues on land...the sea has supplied mobility, capability and support throughout history. Those failing the sea power test, notably Alexander, Napoleon and Hitler, also failed the test of longevity. Edward L. Beach

Despite the end of the Cold War and direct superpower competition over two decades ago, the world has become less stable and safe. Regional instability, civil war, terrorism and failed or rogue states are now considered to be the main threats to world peace and security. This means that crisis can occur at short notice and anywhere in the world. In addition, the rise of asymmetric threats to Australian security has eroded the warning time that Australian military planners have traditionally relied upon to provide indicators of potential trouble.

Australians live on the edge of an arc of regional instability. In addition, our role as an international citizen requires Australian politicians and military planners to look farther afield when preparing to employ the ADF. It can probably be taken as an article of faith that increasingly, Australian forces will be employed offshore and often at considerable distances from the Australian mainland. These threats may range from high intensity operations in support of our allies as we seek to ensure global peace and security, to evacuating Australian citizens from the trouble spots that suddenly emerge. The seas will no longer be self-contained battlefields, or moats behind which nations can secure themselves from the turmoil outside. They have increasingly become the 'great highway and broad common' as described by the American naval strategist Alfred Thayer Mahan, and they will increasingly provide the medium from which Australian forces will conduct warfare in the future.

The nature of maritime strategy

The flexible and successful use of naval forces has been one of the essential force multipliers to establishing global power for centuries in both war and peace. The world's oceans span most of the earth's surface, and provide the vital arteries of trade and communications which, even in this day of air travel and satellite communications, continue to bind the world's economies together. This dependence upon sea lanes of communications has ensured that ...command of the sea and inland waterways has remained a key political and strategic concern of seagoing people throughout history.¹

In essence we define maritime strategy as ...one which in the world's maritime communications systems are exploited as the main avenue by way of which strength may be applied to establish control over one's enemies.2' Sea power is the marshalling of all naval forces; including surface, sub-surface, aviation and marines, to focus on the maritime objectives of national strategy. Naval power can be applied to achieve both peacetime and wartime objectives in a manner that is difficult to replicate with armies and air forces, which lends to navies an inherent level of flexibility. As outlined in Australian Maritime Doctrine, this flexibility devolves from a navy's ability to remain poised for long periods of time in international waters without appearing to directly interfere in another nation's internal affairs, yet able to spring to action quickly when required.3 It is this adaptability that allows one to consider the use of naval forces for political and diplomatic purposes as opposed to purely military ones. Thus, a navy is able to enjoy ... the unique advantage of being able to signal menace without violating sovereignty, and once the need is past, of being able to sail over the horizon without signalling retreat.4

This benefit in both war and peace was ably articulated in a 1985 US Naval War College study highlighting that between the years 1946 and 1975 the US armed forces were employed 215 times (not including the conflicts in Korea and Vietnam). Of these 215 deployments, 177 involved the navy, with 100 being solely naval operations, aircraft carriers were committed 106 times and the marines were involved in 71 of these incidents.⁵ This means that the USN was involved in 82% of foreign incidents, utilising carriers 49% of the time, with 47% of these operations being solely navy and landing marines in 33% of these cases. Thus during a period of

^a Lieutenant Commander Ng entered the Canadian Navy as a Seaman Officer in 1989, transferred to the RAN in 1997, and will transfer to the Army as a major in February 2004.

relative peace, the US was able to actively use its maritime resources to project power onto the soil of a foreign antagonist and bring about a successful solution in 75% of these cases.⁶

Amphibious Warfare as an instrument of maritime strategy

As described in the USN's seminal work ... From the Sea:

...naval forces provide powerful yet unobtrusive presence; strategic deterrence; control of the seas; extended and continuous on-scene crisis response; project precise power from the sea; and provide sealift if larger scale warfighting scenarios emerge.⁷

With the demise of the Soviet Union and the break up of bipolar Cold War configurations, naval forces have seen a renaissance in their traditional roles and applicability that harkens more to the 19th Century rather then the 20th. This has become increasingly true as the focus has shifted from global threats of worldwide and potential cataclysmic destruction to a death by a thousand cuts from a multitude regional challenges and flare-ups. While their level of destructiveness may appear diminutive compared to the armed clashes between superpowers envisioned at the height of the Cold war, these small wars of the 21st Century have gained an importance out of all proportion to their size. International peace and security is assailed from all directions by civil war, ethnic conflict, failed and rogue states. In addition the rise of a global terrorist threat, supported by increasingly militant Islamic extremism, has illustrated that the spectre of mass terrorist attack is no longer confined to the Middle East. Thus, although the prospect of global war has receded, we are in a period of enormous uncertainty with regards to international peace and security.

The problem for a maritime nation is how to translate naval power at sea into effective influence upon the land. A strictly blue water theory of warfare cannot be maintained in a vacuum due to the fact that since ...people live on land, decisive results [can] only be concluded on land.⁸ The historical question then has always been how does sea power grapple with land power? As a medium, the sea provides a potent area for exploitation of enemy weakness as was observed by history's greatest soldier:

Napoleon once wondered if the British really did appreciate the full potential of their naval supremacy. He could deal with a landing of 20,000 British troops on the Continent, but 20,000 British troops aboard transports, destination unknown, would pin

down several number of French ... 9

Ultimately however that landing must occur, the shot must be fired from the ships, and so the insertion, support and sustainment of ground combat elements (and in the modern era air combat elements) by naval forces has been the principal feature of maritime power projection for centuries. However, unlike armies that are constrained by the lines of geography, amphibious forces have been able to exploit the sea as an open and rapid medium by which to choose their time and place of landing in order to capitalise upon the uncertainty and over extension that so confounded Napoleon.

Here lies the true power of amphibious warfare as the unpredictable nature of its movement allows it to turn the sea into an exposed flank for the enemy. This permits it to perform missions far beyond the narrowness of a tactical lodgement, and elevates amphibious warfare into the area of operational and strategic art. It can focus maritime power on a critical point in the enemy's rear and either threaten it to fix him (as in the Gulf War) or strike decisively (as at Inchon). This efficacy of amphibious forces and their role in military and diplomatic missions was effectively expounded upon in 1996 by the then Commandant General Royal Marines, Sir Robert Ross when he stated:

A sea-based force is...an extremely valuable crisis management instrument. It can be sailed early (with or without publicity) and can keep its deployment options open. It can remain at sea almost indefinitely in order to buy diplomatic time, it can loiter. land, reembark or deploy.¹⁰

Amphibious forces represent a significant national strategic asset, capable of offering selfcontained military packages with a strategic reach that is unobtrusive and yet at the same time highly visible. This, coupled with their independence from land bases and ability to maintain a sustainable on scene presence, allows amphibious forces to make a decisive contribution at both the strategic and operational level, and as a result can be considered as highly significant political and military tools. This independence and sustainability derive from the fact that amphibious forces couple the self-contained nature of ships, with the efficiency of sea transport to move ground combat units and their support in mass. Instead of a barrier, the sea is considered as the medium of manoeuvre to turn the enemy's flank or exploit his weaknesses. This clearly highlights the importance of amphibious warfare to naval operations, and further reinforces the point that the primary purpose of forward-deployed naval forces is to project ... power from the sea to

Influence events ashore in the littoral regions of the world across the spectrum of peace, crisis and war.¹¹ Amphibious warfare conceives of a unity, a juncture between land and naval warfare that envisions ...the army and the navy [are] the blade and the hilt of one weapon...¹²

To this must be added the sheer volume of equipment which seaborne forces can carry with them. While airborne forces have a faster insertion time, they suffer from dependence upon tenuous air links for sustainment, slow ground manoeuvre ability, are invariably weak in heavy support weapons, and must be relieved rapidly or else face being overwhelmed by enemy forces once the initial surprise is over. Amphibious forces are able to bring with them a broad suite of warfighting capabilities and the logistics to support them ultimately in a more timely fashion than is possible by air. This was dramatically revealed in 1991 when the UK initially attempted to deploy an advance party of approximately 5% of 3 Commando Brigade to Northern Iraq by air. This aerial deployment included a number of Landrovers and B vehicles. In the end, the advance party was still in the process of arriving three weeks after the main body had already arrived and deployed in theatre by sea.13

Despite the fact that the medium is the sea, when discussing amphibious warfare it is important to remember that as these types of operations bridge the gap between all three spheres of warfare, the closest cooperation and most detailed coordination among all participating forces in an amphibious operation are essential to success. They must be trained together. There must be a clear understanding of mutual obligations and of the special capabilities and problems of each component. As in all elements of warfare, it has been noted that the rapid transfer of force from sea to shore is a matter of sound training and planning and the right equipment.14 Due to their nature the complexity and dynamics of amphibious operations means that they are intensive in time, money and resources. This is particularly so as while it is accepted that whenever possible we would of course chose to land unopposed on a hostile or potentially hostile shore...this luxury can never be guaranteed.15

Finally, whether committed ashore, or loitering in an area of interest, an amphibious force ensures that a sustained approach can be taken, particularly in times of tension. It is a bolt that once fired, is not lost forever, but can either be reinforced or else withdrawn, redirected and fired once more in relatively short order. As has already been stated, the ability of naval forces to operate from international waters without the requirement for bases, overflight or foreign governmental permission means that *the military options available can be extended indefinitely because sea-based forces can remain on station as long as required.*¹⁶

Amphibious Warfare is a difficult and distinctive form of maritime war that goes far beyond mere sea transport. Naval and ground combat units must work intimately together in order to be effective. Ground forces projected from the sea are able to move rapidly and strike decisively over great distances while leaving a small footprint upon the ground. This ability to dictate the place and nature of the combat comes at the price of being dependent upon sea generated combat power (aerial and fire support) and logistic sustainment. In addition the wide dispersal and rapid movement of combat units provides significant problems in relation to command and control.

Amphibious Warfare as an element of Australian maritime strategy

A major factor in the employment of Australian forces in the future will be the ability to deploy responsive, self-contained and highly capable expeditionary forces that can strike deep into the enemy's core and be sustained without having to rely on established or permanent fixed bases. Their effectiveness will be enhanced by manoeuvrability. versatility flexibility and coupled with the capacity to range widely, strike without warning and then reconstitute themselves for further missions in a rapid fashion. To carry out these tasks will require a robust, effective and responsive amphibious force, and it is just this sort of formation that is increasingly being viewed as Australia's capability of first resort.

Today, Australia's vital economic, political, and military interests are truly global in nature and scope. In many respects these interests are located across wide oceans, and to a great extent they intersect those of current and emergent regional powers. Thus, for Australia, the strategic operating environment must be viewed as primarily a maritime one. Because we are a maritime nation, dependent upon the free and unrestricted movement of shipping to and from our shores to overseas markets and transhipment points, our security is necessarily a transoceanic one.17 Our vital interests, those interests for which Australia is willing to fight, are at the endpoint of highways of the seas or lines of strategic approach that stretch from Australia to other points on the globe. It is in this maritime theatre where the RAN, operating from sea bases in international

waters, can influence events ashore in support of these interests. To this end, the RAN should start to examine how to develop our budding amphibious capability in a concerted and coherent fashion and this could well include the development and establishment of an Australian Amphibious Ready Group (ARG).

In general terms it is envisioned that this ARG would comprise a ready force package comprising amphibious ships, ground combat and support units and the requisite air and surface transport craft necessary to insert them ashore as a tactically viable unit. It would comprise units from all three Services, jointly trained, exercised and deployed on a continuing basis to ensure the retention of corporate knowledge in tactics, planning and procedures that is so vital to successful military operations. These could comprise new formations and equipment, or the collocation and above all dedication, of existing ones. The ARG would include such capabilities as necessary to exploit the joint battlespace as a medium for imposing our will upon the adversary by supporting and sustaining the ground combat elements from the sea and air. It would be deployable on short notice and form an integral part of the RAN's Fleet Activity Schedule and the ADF's regional engagement plan. In short, the ARG would be employable as a self-contained force package that could be augmented, supported or integrated with other ADF elements as dictated by the required role and mission.

As a continental maritime trading nation surrounded by the sea, Australia is dependent upon the ocean as her primary means of defence. This fact, coupled with the need to maintain our overseas links for trade, means the need exists for a truly national amphibious capability, as opposed to an alliance dependent one. This is particularly so despite the assertions of many that a more viable, and more economical (read cheaper) defence plan should be to concentrate upon continental defence. It is a vital necessity that Australians must acknowledge the simple fact that Australia cannot be adequately defended only by guarding our territory and merely looking on at the changes sweeping through Asia.¹⁸ The bankrupt policy of defending Northern Australia neglects Australia's overseas interests and the fact that ... a frontier strategy would not be able to cope with breakouts along Australia's long northern border.,,19 should an invader actually establish himself ashore.

The peculiar nature of amphibious warfare has traditionally made it the poor cousin of the other warfare disciplines. Like all hybrids it suffers from straddling two sides of the fence and does not sit quite easily in either arena. Too often it has been allowed to languish as each element feels that the other should look after the unwanted child of their union. It has been stated that since

no single service has a particularly vital selfinterest in promoting amphibious warfare in the resources scrum, nor is there any other body such as an Australian Marine Corps to represent the amphibious case. This results in a 'Catch 22' relationship...Lack of representation has lead to lack of strategic direction, which has in turn perpetuated the lack of representation.²⁰

Unfortunately, it has been the traditional belief among many within the ADF that ...amphibious movement is...little more than a means of administrative transport, rather than in the broader sense of operational manoeuvre from the sea.²¹ Thus, unlike many navies around the world, amphibious warfare within the RAN and the ADF has often been relegated to an administrative role and concept as opposed to a true warfighting capability. The reality as expressed by the Commandant General Royal Marines is quite different:

amphibious capability is not just about sea transportation. Indeed the ability to project power forward in the littoral or 'near land' area of the world is arguably more demanding than deep water naval combat.²²

In the past, amphibious capability has been approached from different directions as individual services concentrated on those working parts that affected them, as opposed to addressing the whole of the system. Of particular importance has been the disparate development of many elements of Australia's amphibious forces. It appears that the Navy, in its escort-focused culture's disdain for the development of its own ground combat capability, has concentrated upon the elements of the bow, while the army has in isolation concentrated purely upon the arrow, with no interaction to determine whether it fits the bow. Of significant note is the fact that nowhere does the RAAF appear in the equation. Despite the importance of air superiority in the modern era, with the exception of the area surrounding fixed bases, Australia has had no ability to inject airpower into the joint battlespace since the demise of the RAN's aircraft carriers and the Fleet Air Arm. It is salutary to realise that as a nation that suffered so much from the disaster that was Gallipoli it should have ignored so vividly its lessons, and this despite the fact that the Gallipoli Campaign is the bar against which every amphibious power assesses its ability. This situation will have to change if we are to be

successful in the future and avoid the mistakes of the past. Amphibious warfare requires a smooth synergy in order for it to be effective. Specialist ships, craft, training, aviation and ground combat and support elements must be combined and fielded in a coherent tactical organisation that can plan, execute, and above all adapt, to the ebb and flow that is modern warfare.

The present nature of the ADF structure necessitates that this must be a joint tactical problem and therefore will require a joint solution. Unit training must focus on these operations as a core capability, not a secondary one. Equipment procurement decision-makers must be cognisant of the realities of the amphibious environment and ensure that systems and equipment are complementary. As has been illustrated, one cannot fuse disparate parts into a smooth running machine, they must be engineered to fit together. To this end Joint Project 2048/2027, SEA 4000 and AIR 9000²³ (among others) offer a unique opportunity to overcome this impasse as Australia is not constrained to the point that some other nations are by legacy systems. Given the apparent disjointed approach of the past, it would seem that in the future, defence equipment acquisitions ... will have to pass the three key tests of versatility, usability and interoperability with allies.²⁴

However, the ADF should look beyond the mere acquisition process in order to develop a truly viable amphibious organisation and gain all the strategic and operational utility that the ocean provides. A significant cultural and organisational shift will also be necessary if we are to reap the maximum benefits and advantages from this. The development and acquisition of amphibious platforms and other core systems will require a joint intellectual effort. Improved management processes and organisation are necessary to effectively develop and sustain the ADF amphibious capability for the future. While the roles and missions of an Australian ARG have been outlined, the actually composition of this force package can be scalable to reflect requirements and the capacity of the ADF to develop such an entity. It will be the culmination of inputs from various single service experiments such as Headline and Headmark, and some joint modelling and development work. Ultimately, there should be no mistake that these sorts of operations are in fact the ADF's core business. Anyone who doubts this requirement should remember that this is one of the current Chief of the Defence Force's highest priorities.

The development of a standing ARG capability is not limited to operations in the military sphere. As US, UK, Dutch, Spanish and French efforts in



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Africa, the Caribbean and the Indian Ocean have illustrated, amphibious forces ... can make a most useful contribution right across the spectrum of activity, from disaster relief through evacuation of nationals and humanitarian operations to hot war.25 Imagine what a difference could have been made in Papua New Guinea if, after the tidal wave of July 1998, an amphibious task force with its helicopters, operating theatres and construction equipment had arrived right at the point of impact and area of greatest need. Operating free of the land-based infrastructure of roads and airfields (in fact, capable of constructing a new one) and with a weight of numbers and equipment surpassing what could be airlifted in, such a task force could have brought aid directly to the affected area. Similarly, if an ARG had been able to position off Bali within a short time of the bomb blast to treat the injured on scene, much suffering could have been alleviated and an immediate sense of security imposed on the situation. Amphibious forces at sea can insert not just combat power onto enemy weakness, but humanitarian assistance to the scene of disaster as well.

Historically all of Australia's wars have been fought off the mainland, and there is no indication that this situation will change in the near future. vital interests: trade, resources, Australia's commerce, peaceful markets and the access to them, all lie offshore. As threats to these interests are most likely to originate outside of Australia, it stands to reason that the effort required to defend them will have to be conducted offshore and far from Australian bases as well. Therefore, in order to ensure that the Navy's ability to remain off hostile shores as a clear signal of resolve and intent achieves its full potential as a vital asset to foreign policy, it must be allied to the ability to project this influence ashore. In order to realise these advantages, the persistent and continual development of amphibious forces must continue. In particular, there must be a move to integrate the concepts of amphibious operations into the larger doctrine of maritime warfare and bring the disparate elements together to form a cohesive whole. Rather than depending upon the timely arrival of allied assets to stabilise a situation, it would be prudent to consider how the coherent build up of an independent and effective amphibious force would provide Australia with a powerful diplomatic and military tool. Success would gain for Australia a ... balanced structure of military capability which can respond to the unexpected, with or without assistance from allies, and whose principal attributes are costeffectiveness, versatility, utility and ubiquity...²⁶

in ... From the Sea

...unrestricted by the need for transit or overflight approval from foreign governments in order to enter the scene of action...naval forces [have] the unique capability to provide peaceful presence in ambiguous situations before a crisis erupts.²⁷

In the end, a true Australian amphibious capability would enable the ADF to ...,project a...positive image, build foundations for viable coalitions, enhance diplomatic contacts, reassure friends, and demonstrate...power and resolve,²⁸ out of all proportion to its cost and size.

Conclusion

While it is generally recognised that ... command of the sea by itself would never fully carry the day and was only decisive in its facilitation of land operations,²⁹ the means to accomplish that end has always been difficult to coordinate and execute. Thus the increased debate over amphibious operations and how best to achieve them. It is more than just a term, for Expeditionary implies a mind set, a culture, and a commitment to forces that are designed to operate forward and to respond swiftly.30 It sees a seamless flow from the maritime to the land and concentrates environment upon the adversary's decisive points and seeks to exploit his weakness to our advantage. It envisions forward deployed naval assets, on call and available being able to steam, loiter, manoeuvre and strike were and when required. Although this is a far cry from the current state of affairs in the within the ADF it is a valuable, and viable, goal for future development. As one international affairs specialist put it

Since our national interests and liberal democratic values are demonstrably threatened by the tyranny of armed despots and transnational terrorist organisations, logic dictates that our responses ought not to be proscribed by distance or arbitrarily drawn lines on a map.³¹

In this sense, it is prudent to consider that it has long been a rule among business circles that *...companies invest in overseas presence because actually 'being there' is clearly the best way to do business.*³² So too it is with navies. The continual deployments of RAN units overseas are significant in the diplomatic and military role they play towards shaping our strategic environment through international engagement. This in itself is an important part of Australia's Military Strategy.

The development of a true amphibious capability, powerful, deployable and visible,

would go a long way in improving the military standing of Australia within the region. A visit by an Amphibious Ready Group would reassure our friends, impress neutrals, and make a significant point upon anyone harbouring less than benign thoughts towards Australia. Interesting times are upon us and to face these challenges it is imperative that we are cognisant of ...*it is important that naval forces avoid a narrow definition of their capabilities. At the same time, the fact that the future is uncertain is no excuse for failing to make adequate preparations.*³³

The achievement of a mature, effective and viable amphibious capability will require a good plan, concerted effort, innovative thinking and a new approach with better links than is currently available. We cannot afford to carry on with 'business as usual'. Ultimately we must reflect upon the words of that great naval historian, Dudley W Knox:

The supreme test of the naval strategist is the depth of his comprehension of the intimate relation between sea power and land power, and of the truth that basically all effort afloat should be directed at an effect ashore.

¹ Clark G Reynolds. Command of the Sea, London, 1976, p. 1.

² Captain JC Wylie, 'On Maritime Strategy', USNI Proceedings, 1953, p. 468.

' Royal Australian Navy, Australian Maritime

Doctrine, Defence Publishing Service, Canberra, 2000, p. 43.

⁴ Admiral AH Trost, 'Looking beyond the Maritime Strategy', USNI Proceedings, 1987), p. 14.

⁵ Laurence Martin, 'The Use of Naval Forces in Peacetime', *The Naval War College Review*, Newport, 1985, p. 9.

⁶ ibid

⁷ United States Navy, ... From the Sea, Department of the Navy, Washington DC, 1992, p. 1.

8 Lt Col John D Gibson, 'Sir Julian Corbett on

Amphibious Operations' Marine Corps Gazette, March 1998, p. 69.

⁹ John R Elting, *Swords Around a Throne*, George Weidenfeld & Nicolson Limited, London, 1989, p. 504.

¹⁰ Lt Gen Sir Robert Ross, 'The Role of Amphibious Forces in a Changing World', *RUSI Journal*, April 1996, p. 22.

¹¹ Scott Bowden, 'Forward Presence, Power Projection and the Navy's Littoral Strategy: Foundations Problems and Prospects', IRIS Research Paper, July 1997, p. 1.

12 Gibson, p. 68.

¹³ Major R.E. Moyse, RM, 'The Future of Amphibious Warfare in the ADF-Cognitive Dissonance or "Catch 22"?' Australian Defence Force Journal, No. 117, March/April 1996, p. 26. ¹⁵ Ross, p. 22.

¹⁶...From the Sea, p. 7.

¹⁷ Australian Maritime Doctrine, pp. 12-13.

 ¹⁸ LCDR John P. Robinson, 'Manoeuvre from the Sea-The Forgotten Force Multiplier', *Australian Defence Force Journal*, No. 125, July/August 1997, p. 47.
 ¹⁹ Sam Roggeveen, 'Amphibious Warfare in the ADF: The Poverty of Non-Offensive Defence Strategy in the Australian Context', *Australian Defence Force Journal*.

No. 120, September/October 1996, p. 36.

²⁰ Moyse, p. 27.

²³ LPA and amphibious watercraft replacement, the Air Warfare Destroyer, and the ADF helicopter strategic master plan.

²⁴ Alan Dupont, 'Straitjacket off as defence gets real', *The Australian*, 27 February 2003.

²⁵ ibid

²⁶ ibid, p. 21.

²⁷...*From the Sea*, p. 3.

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²⁹ Gibson, p. 68.

¹⁰ ibid, p. 2.

²¹ Dupont, 'Straitjacket off as defence gets real'

32 Adm Jay L Johnson, USN and General Charles

Krulak, USMC, 'Forward presence essential to

American interests' USN library website, 1998, p. 1.

33 'Operational Maneuver From the Sea', p. 3.

²¹ ibid, p. 25.

²² Ross, p. 22.

Logistic support in Operations Bastille and Falconer

Commander Christopher Percival, AM RAN

At around midday on a sunny but mild Tuesday in early December 2002 I arrived at the Fujariah International Airport, United Arab Emirates having enjoyed the in-flight services of the ADF contracted IL76 for the previous twenty two or so hours. The flight departed RAAF Base Pearce (at last) at 1900 the previous day. After a brief stop over at Diego Garcia at midnight (local) for fuel we proceeded to the end of the line after dropping off cargo and a few personnel at Kuwait. As our point of entry in the Middle East, from what we could, Kuwait appeared to be a relaxed and quiet city. Off in the distance one could see activity at the Kuwait International Airport but where we were, all was pretty quiet. A couple of local Kuwait security vehicles, each with a load of armed personnel were parked just off the apron watching as we stretched our legs while waiting for the cargo, headed for the ADF contingent at Camp Doha to be offloaded.

So commenced my tour of duty as the Commander of the small but very effective Royal Australian Navy Logistic Support Element, Middle East. Hopefully this article will provide a perspective of the activity of logistics support as viewed by the Commander RAN Logistic Support Element, Middle East during the period December 2002-March 2003. This submission will not address the specific employment of any ADF units in Operations *Slipper*, *Bastille* and *Falconer*. Rather it will provide an insight into the logistic planning and subsequent provision of logistic support to RAN units that participated in these operations.

As we entered 2003, Commander Task Group (CTG) 633.1, the Maritime Task Group Commander had developed a draft Concept of (CONOPS) covering maritime Operations activities for possible operations in IRAQ. The proposed CONOPs required a change to the traditional Concept of Logistic Support that the Logistic Support Element (LSE) and Maritime Component Command, Australian Theatre (MCC AST) had followed for earlier RAN deployments to the Middle East Area of Operations (MEAO). This reassessment was due primarily to the substantial increase in Coalition assets expected to be deployed to the MEAO and the uncertainty as to whether the level of support that had been

available in the recent past, would in fact remain. It is the author's assessment that a major assumption made by all Australian Operational Level Headquarters was that support traditionally provided by Coalition and Host nation resources in the MEAO would continue to be provided at the same level. Certainly this was an optimistic approach!

By mid January 2003 frenetic operational and logistic planning at both the Coalition ((United States Navy Central Command (NAVCENT)) and National (Australian) level was under-way in anticipation of increased Coalition operations. From the logistic perspective, planning in support of CTG 633.1 and HMA Ships *Anzac* and *Darwin* as well as the proposed deployment to the (MEAO) of HMAS *Kanimbla* and AUSCDT Three became the priority.

History would show that the RAN assets intheatre would not increase dramatically. The increase in maritime Coalition (primarily USN and RN) assets in the Middle East Area of Operations and the promise of the international community to provide maritime assets in support of the War on Terror had the potential to severely strain the logistic resources operating in the AO. To maintain perspective the MEAO comprised the Red Sea, the Horn of Africa, the Arabian Sea, the Gulf of Oman, the Straits of Hormuz and the Arabian Gulf comprising the South Arabian Gulf (SAG), the North Arabian Gulf (NAG) and the Central Arabian Gulf (CAG). In late December 2002, The United States Navy Logistic Force Commander, Commander Task Force 53 (CTF 53) was providing afloat logistic support to 47 maritime Coalition units in this broad AO. At the end of March 2003, the number of units being supported by CTF 53 was in the vicinity of 174, including Carrier Battle Groups. While a number of other nations provided capable and well received logistic support platforms including the Japanese Maritime Self Defence Force, the Royal Navy, the Royal Canadian Navy and the Polish Navy the number of "weapons platforms" requiring support tested the coordination and ability of CTF 53 particularly as the operational tempo increased.

^{*} Commander Chris Percival was the Commander Logistic Support Element, and for his services was made a Member of the Order of Australia.

Logistic Support Element (LSE) mission

The mission of the LSE was to provide all aspects of logistic support and resources to sustain RAN Force Elements (FE) and other deployed ADF assets as required in the MEAO. From the RAN logistic perspective the MEAO covered the Arabian Gulf in its entirety (NAG, CAG and SAG), the Straits of Hormuz and the Gulf of Oman. The RAN FE included CTG 633.1, *Anzac*, *Darwin* and *Kanimbla* and the Australian Clearance Diving Team Three (AUSCDT 3).

The mission of the CMDR LSE was twofold. The CMDR LSE was the Commanding Officer of the LSE MEAO. Additionally this position was a key player in the planning of the concept of logistic support and subsequently the development of the Maritime Component Command Australia's (MCC AST) Administrative Instruction for both Operation *Bastille* and *Falconer*. CTG 633.1 utilised the position of CMDR LSE as both his N5 (Plans) and subsequently as the N1/N4 (personnel/logistics) responsible for providing guidance and advice on current and possible logistic and personnel issues that could affect the operational effectiveness of the Task Group.

Current operations

Amongst all this planning in late December 2002 and January 2003 was the continued real-time logistic support for *Anzac* and *Darwin*, which covered the whole range of traditional logistic support including:

- Port visit planning and implementation
- RHIB maintenance and the challenges in getting unserviceable boats ashore and serviceable boats back to respective ships without requiring the units to detach from current operations. Enter the Polish Logistic ship, which provided an outstanding capability in the delivery, of deck cargo to and from our units in the NAG.
- Provisions coordination
- Mail receipt and despatch
- Personnel movements
- Medical support
- Aircraft and ship Diplomatic Clearances
- Continued interface with US, UK and other Coalition force logistic organisations.
- Maintenance of liaison with local contractors, agents, providores and local officials.

Proposed operations

For the proposed operations, planning considerations included the deployment of *Kanimbla* and CDT3 to complement the earlier Maritime operations being undertaken by *Anzac*

and Darwin in the Northern Arabian Gulf (NAG).

The transition from Operation *Slipper* to Operation *Bastille* and finally Operation *Falconer* created separate challenges, not the least of which was the plethora of supporting documentation promulgated by ADF Strategic and Operational level headquarters. As an illustration, the following authorities separately developed Administrative Instructions (ADMIN INST) all of which had an effect on the way the LSE conducted operations in support of primarily the RAN Task Group:

- Headquarters Australian Theatre (HQAST)
- MCC AST
- Joint Logistic Command (JLC)
- Joint Health Services Agency (JHSA)

A number of additional challenges were looming on the horizon as December 2002 came to a close. The LSE had reduced in size from 10 to 6 but continued to operate two offices in Bahrain and Dubai. ADF sustainment flight operations delivering ADF cargo, mail (Army and Air Force) and personnel into the Air Point of Debarkation (APOD) at the International airport in Fujariah, United Arab Emirates (UAE) had increased in frequency from one to two flights per week. By early March 2003 the frequency of ADF Sustainment flights had increased to four per week. Noteworthy was the fact that the reception, coordination and onward movement of personnel and cargo from these sustainment fights was the responsibility of three movements personnel, one of which was attached to the LSE.

The difference between the planning and implementation of support provided to ADF units throughout 2002 was that support had been initially restricted to Maritime units. The ADF concept of logistic support for Operations *Bastille* and *Falconer* included the deployment of both Air Force and Army units. While this paper will not address any specific support arrangements for any non-Navy ADF units the Air Point of Debarkation (APOD) at Fujariah became particularly busy.

In retrospect the reduction in staffing levels of the LSE was untimely. The rationale for the reduced staffing was based upon the fact that two MFUs did not need the same level of support as three. This philosophy is one that the RAN continues to harbour as good business. Realistically however, the range and depth of support required for one unit is no different to two or three units. What should determine the staffing levels is the operational tempo. Of course issues such as manpower ceilings in theatre also have the tendency to cause headaches to planners when attempting to provide the most effective "personnel footprint" in support of an operation. The decision not to deploy a RAN support vessel (HMAS *Westralia* or *Success*) was made noting that the US and UK had historically provided afloat assets with the ability to replenish the RAN units. While there was more to this decision, the fact remains that the conscious decision was made noting that support would be available from USN and RN sources. Of note was the concern expressed by CTF 53 that any substantial increase in maritime units would be affected by the lack of available afloat support units.

In the first instance it meant that the range and frequency of support provided historically by the USN logistic support organisation (CTF 53) would be substantially stretched.

The question at this point was how dependent upon the USN logistic support infrastructure was the RAN units? The support provided by the USN through CTF 53 in the first instance and on occasion by units of the US Marine Corps was comprehensive. Yes the RAN and ADF units that deployed to the MEAO in support of Operations Bastille and Falconer could certainly have operated independent of external (Host nation and coalition) support. Lines of communication substantially however would have been lengthened and delivery times would have subsequently increased. This approach would have affected the ability of the RAN Task Group to achieve its aims as detailed in the CONOPS as the ability to effectively sustain the TG would have been questionable. On task time would therefore be affected.

helicopter The USN logistic assets. affectionately known as Desert Ducks, that delivered urgent parts, mail and personnel to units in the NAG was a crucial factor in the ability to sustain RAN units at sea. The Sea King helicopters that comprised the Desert Duck fleet were an aging group of dircraft and certainly struggled to keep pace with the heightened tempoof operations. In December 2002 units in the Northern Arabian Gulf could expect to see a Desert Duck twice per week, by mid March 2003 these "workhorses of the sky" were flying seven days per week. It's little wonder that bags of mail would occasionally arrive on deck with hydraulic fluid all over them. Additionally the ability to consign provisions to USN/USNS afloat logistic support units out of Bahrain and Jebel Ali (UAE) were considered by the author to be crucial to the continued sustainability of Anzac, Darwin and Kanimbla. At short notice a call on the CTF 53 Sustainment Cell staff in Bahrain could confirm space available on the next support ship heading out of either Bahrain or Jebel Ali. This flexibility

and "can do" attitude often provided the LSE with the necessary breathing space needed to ensure sustainment provisions, including the occasional eighteen to twenty four drum load of 44 gallon drums of lubricant could be delivered at sea without the necessity for the receiving unit to detach from its major tasking.

LSE composition

During the transition from Operation *Slipper* to *Bastille* the LSE extended its permanent coverage to three primary locations across the Area of Operations (AO) including Bahrain, Dubai and the APOD located in Fujariah (UAE). The increase in sustainment flights resulted in the decision to source permanent accommodation in Fujariah to facilitate the permanent LSE presence in support of all sustainment flight arrivals into the Area of Operations. In mid February 2003, the 26 members of CDT3 joined *Anzac* and *Darwin. Kanimbla* joined the Task Group in late February 2003.

At the commencement of the reporting period the composition of the LSE was as follows:

- CMDR LSE (Chris Percival)
- LCDR LSE (Wolfgang Miko)
- LEUT LSE (Ian Jamieson)
- CPOSN (Craig Murdoch)
- PONPC (Darren 'Harry' Butler)
- SGT (MOVDET) (Richard Hardy)
- LSSN (Glen Boston)

During the period the following positions changed out:

- LEUT LSE (Corinne Court)
- CPOSN (Michael Eaton)
- SGT (MOVDET) (Glenda Woods)

24-hour operations remained a reality across a wide area of the MEAO for the LSE through out the reporting period. The broad range of functions that the LSE performed invariably required staff capable of multiple tasks, often beyond their core roles.

Early in the reporting period it became apparent to the author that the LSE was under staffed for the current range of logistic support operations. Upon my arrival the LSE comprised seven personnel. Downsizing from an enhanced team of nine had occurred earlier in 2002 due the reduction in MFUs in theatre from three to two.

The split office/manning between two disparate locations (Bahrain and Dubai) resulted in duplication of effort with the management of two office activities. The many and varied support functions of the LSE across the region resulted in an already stretched resource that required the 10

ability to continue to provide 24 hour coverage of all support aspects. Ideally this could only be achieved through a 24-hour watch process whereby the staffing levels could permit an occasional recuperative break without adversely effecting the productivity of the team. With seven personnel split between two and at times three locations, this was at best, difficult to achieve.

In January 2003 subsequent to a submission to MCC AST, approval to increase the LSE complement by two additional personnel was given. In February 2003 the permanent LSE complement increased to nine with a Leading Seaman Writer (LSWTR) and Able Seaman Stores Naval (ABSN) joining the team.

The submission and subsequent approval for two additional personnel to be posted as part of the LSE was well received and afforded the LSE the opportunity to focus its energy towards the provision of crucial logistic support to the RAN units and personnel in theatre. Each position was separately justified. The additional stores sailor integrated within the team in Bahrain focused his attention the daily cargo and passenger management at the US Aviation Unit (Av Unit) located at Bahrain International Airport. The LSWTR took on the role as office and accounts manager located in the LSE Dubai office.

With the substantial increase in operational tempo in February 2003 a further request for staffing assistance was met through CTG resources where-in CTG staff members rotated ashore to assist the LSE with the management of the extensive messaging processes. This support proved invaluable at the time.

Development of the logistic support concept

Over the New Year period I embarked in USS MILIUS for discussions with CTG 633.1. This visit was opportune as the development of the concept of operations for the proposed RAN Task Group was being undertaken. CTG 633.1 requested that I draft a proposed concept of logistic support that could be implemented for three major fleet units and a diving team. At this time the only confirmed units were Anzac and Darwin. Approval and subsequent deployment of Kanimbla and CDT3 was still some way in the future. The draft concept of logistic support was agreed by CTG 633.1 and transmitted to Maritime Headquarters for consideration. While this logistic support concept didn't change much to that developed for previous deployments of RAN major fleet units to the Arabian Gulf, assumptions for this proposed activity were substantially different to that implemented for Operation Slipper. Issues such as available afloat support (fuel, provisioning), log helo (Desert Duck) capability and force protection were among the list for consideration

Logistic support implementation

The provision of logistic support to RAN units would remain similar to that which had been provided to RAN units undertaking Damask deployments to the Arabian Gulf over the preceding ten years. Mail would continue to be delivered via commercial courier to the International Mail centre in Bahrain. Urgent stores (Defect related) would continue to be sent by commercial means to Bahrain where they would be cleared by Bahrain Customs and delivered to the LSE at the US Aviation units by the contracted agent, Inchcape Shipping Services (ISS). Provisions would be ordered through the local supplier and either delivered to the customer unit alongside or embarked as consigned cargo in the first available afloat support ship heading to the NAG. The dependence upon the twice weekly logistic helicopter delivery to ships in the NAG (Desert Duck) was substantial. This service delivered mail, personnel and stores to all units and substantially reduced the requirement for ships to detach or to utilise their organic helicopters to deliver personnel ashore or indeed to receive urgent repair, replacement parts to return crucial equipment to serviceability. This Desert Duck service proved its worth time and again allowing the RAN units to remain on station performing crucial tasking while awaiting the repair parts. The ability to deliver mail via the Desert Duck was also an outstanding morale booster. The fact that some bags of mail would end up smelling and on occasions covered in hydraulic oil from a split hose in the delivering aircraft didn't seem to detract from the service.

Command and Control

Initial Command and Control (C2) procedures had the CMDR LSE responsible to Maritime Commander, Australia (MCAUST) through Chief Staff Officer Support (CSO SUP) maritime Headquarters for the delivery of support to RAN units. With effect from 15 December 2002, the CMDR LSE became responsible to Commander (COMAST) through Theatre Australian Commander Task Group 633.1 for the provision of logistic support to Task Group 633.1. This was a significant cultural shift as the LSE, while remaining responsible to CTG 633.1 was responsive to Maritime Command for the provision of logistic and administrative guidance. Direct support of both the LSE and all RAN FE remained within component lines.

The change to the C2 arrangements did not affect the level of logistic and administrative support provided to the RAN FE. There was however, an initial reduction in the provision of feedback to MHQ, the direct result of the change in C2. Within a very short period however, this communications link was restored with CMDR LSE providing an information copy of the daily personnel/admin/log status report to MHQ. The LSE was under the National Command of ASNHQ, and maintained a close working relationship with that HQ. As directed by CTG 633.1, CMDR LSE took on a more formal operational role as the N1/N4 for CTG 633.1.

From a command perspective the change in C2 was logical and resulted in the CMDR LSE providing increased "value for money" in the wider operational perspective. The change certainly required the position of CMDR LSE to become a more proactive participant in the management of TG afloat logistic support (TGLC) and TG personnel issues. The direction for support to be provided to FE along component lines required a clear line of communication between the LSE and the Maritime Component in this instance. This link was essential to the successful delivery of support to CTG 633.1 and TG FE.

Australian National Headquarters. From the LSE perspective the relationship with the national headquarters was one of cooperation and indirect support. One could say that the LSE became the eyes and ears of the ASNHQ in Bahrain. Certainly guidance and advice related to local threat conditions in and around Bahrain and the UAE was directly passed ASNHQ on a regular basis.

Interface with the Maritime Component Command. The interface with the Maritime Component Command (MCC) from a logistic perspective was robust and well tested. While the C2 aspect changed, the responsibility for logistic support remained within component lines. The points of contact for logistic support from outside the AO remained within the Maritime Component Command. In fact, direct communications between the LSE and HQ AST was minimal and in most cases nugatory as MCC logistic staff handled all requirements.

Interface with USN Commander Task Force 53 (CTF 53). This interface was crucial to the continued sustainability of all RAN units. Logistic Helicopters (Desert Ducks), intra theatre air lift (C-130, C-9, Boeing 747), afloat support in the form of USS units and USNS logistic support shipping all complemented the ability of the RAN LSE to provide timely and comprehensive support

to the RAN units.

Friendly Force Coordination Centre (F2C2). The Commander LSE, as the Senior RAN Officer in Bahrain was the nominated RAN representative to the Friendly Forces Coordination Centre or F2C2. This US led Maritime group comprised representatives from countries participating in the War Against Terror and included Spain, Germany, Kuwait, Italy, Poland, New Zealand, Great Britain, Canada and Japan. This diverse group was to source assets in support of activities across the MEAO. From a RAN perspective the F2C2 facilitated the excellent support provided by the Polish unit (Czernicki) in support of the units in the NAG. On numerous occasions the continued sustainability of the RAN units was enhanced by the delivery of spares and provisions including the operationally crucial RHIB via this flexible and most capable major fleet unit.

Interface with C5F RANLO/NAVCENT RANLO. For such a complex operation, RAN liaison officers embedded within the respective US led coalition organisations were considered crucial to ensuring the RAN maintained its strongest and most influential presence in all planning and implementation. From a logistics perspective the RAN Liaison Officers embedded within the Fifth Fleet and the US Naval Central Command were the major source of current operational planning. These positions were also crucial to providing an 'in' to numerous planning meetings that otherwise would have progressed without the specific RAN logistic considerations.

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Interface with the Royal Navy. While on a smaller scale compared to the working relationship the LSE had with CTF 53, the relationship with the British Maritime Component Command was robust. The interface between the RAN and the Royal Navy (RN) was particularly strong and credit for this has to be placed squarely upon the shoulders of the RAN NAVCENT Liaison Officer. Liaison between the RAN and RN logistic planning staff was also well developed. This was the result of a welldeveloped working relationship between previous Commanders of the RAN LSE and their RN counterparts. Particular issues that were addressed under the RAN/RN logistic planning umbrella included the continued afloat support capability by the Leaf class RFA and the anticipated medical support requirement as a result of possible casualty levels. The medical support issue was one that was not particularly well addressed from the Australian national level and took some time to clarify.

Clearance Diving Team Three

The deployment of CDT3 into the theatre introduced a new dimension for consideration by the LSE. This deployment included the movement of personnel, weapons, vehicles, ammunition and a range of personal equipment. The aim was to embark CDT3 and equipment into USS Gunston Hall soon after the team's arrival in Bahrain. Included in this initial challenge was the requirement to obtain clearances to transport the team's weapons and dangerous cargo from the US Aviation unit located at Bahrain International Airport to Mina Sulman Pier where Gunston Hall was berthed. The clearance process to move sensitive equipment including weapons through Bahrain was a literal minefield. At the eleventh hour approval by the Bahraini authorities was provided and what appeared to be a seamless operation was undertaken. Bahrain public security personnel and vehicles included. After an extensive embarkation operation to load the team's equipment into Gunston Hall, the decision not to sail in her was made and the equipment was offloaded.

The arrival of Kanimbla alongside Bahrain coincided with the arrival of CDT3. Embarked in Kanimbla was approximately 40 ton of diving equipment that was also to be transferred to Gunston Hall. The decision not to embark the diving team's equipment into Gunston Hall resulted in the necessity to accommodate approximately 45 ton of diving and personnel equipment indefinitely until deployment plans could be finalised. The sourcing of warehouse space within the confines of the Bahrain maritime port by the LSE was timely although not altogether planned for storing diving equipment. The warehouse space was initially considered as an overflow for general RAN cargo that could not be accommodated at the US Aviation unit warehouse awaiting delivery to RAN units via the Desert Duck. The requirement to consider options was due to the considerable amount of cargo the USN had concentrated in Bahrain at the Aviation Unit for subsequent onward delivery to the USN units in the NAG, CAG and SAG. Noting that Bahrain was the Middle Eastern Hub for all USN airlift deliveries, the amount of US cargo was immense and reduced both the access to the cargo bay allocated to the LSE and effectively put to rest any consideration of extending the floor space available. The option to utilise warehouse space at the port worked well as the RAN cargo would remain within a "bonded" area under therefore would not be subjected to any customs processes.

What appeared to be a seamless and well planned activity facilitated the secure stowage of a range of equipment and also provided CDT3 an acceptable location to test and prepare equipment while awaiting further deployment instructions. Weapons and ammunition were secured in appropriate secure stowage areas arranged through close liaison between the RAN Diving team and their USN counterparts.

When the equipment was at last called forwarded, four semi trailers were required to transport the diving equipment alongside the *Gunston Hall*.

The subsequent deployment of CDT3 to Kuwait was also subject to diplomatic approval by the Kuwait Navy. The visit by CTG 633.1 to Kuwait and the Kuwaiti Naval Base where CDT3 were to concentrate for further operations was timely as the Commander of the Kuwaiti Naval Forces met with CTG 633.1 and provided enthusiastic approval of the CDT presence. From a logistic perspective, however support for the CDT in Kuwait was somewhat of a challenge with increased difficulties experienced in sourcing most items in country. Additionally the delivery of weapons and ammunition from Bahrain and arranged through the US Marine Corps was a moving feast and one that concerned the author greatly. The successful outcome yet again proved the point that "to stress" was good.

Commander's Reserve

As the Diving equipment was being offloaded from Kanimbla so too did fourteen containers comprising the Commander ASNHO Reserve. This reserve contained a wide range of equipment including NBC IPE, Kevlar protective vests and helmets and general desert uniforms for 200 personnel. Due to unsatisfactory weather conditions the initial plan to disembark this equipment alongside the port of Jebel Ali, UAE the previous day was cancelled. Due to operational exigencies Kanimbla proceeded to Bahrain with the intention to offload this equipment and for the LSE to facilitate the movement of the Commanders Reserve to the UAE by alternate means. The challenge with this requirement was the sensitive nature of equipment and the inability to transport by commercial air or road. Additionally the availability of intra theatre lift support to move such a large amount was not possible. The decision was made to transport the containers to the UAE via commercial sea freight. While initially seen to be the most cost effective and efficient method of delivery in the time available the final result was somewhat of a challenge as the deadline changed dramatically due to developing operational imperatives.

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Deployment of the LCM8

A separate challenge was the deployment of the two Army LCM8 craft that were embarked in *Kanimbla*. These two versatile craft initially deployed from *Kanimbla* to the Northern Kuwait Coastguard station along with units of the Royal Marine riverine squadron. The initial challenge here was the facilitation of diplomatic clearances through official Kuwaiti channels to operate elements of the ADF outside the previously approved ADF participation within Camp Doha, Kuwait City.

Procurement of 5 inch ammunition

The procurement of 5 inch cartridge and charge for Anzac in anticipation of forthcoming operations successfully tested the Australian/United States Acquisition and Cross Servicing Agreement (AS/US ACSA). The request for assistance to procure 5-inch ammunition from USN sources was met with a positive response from CTF 53 Explosive Ordnance staff and the NAVCENT J4. The delivery of ammunition was affected at sea at short notice between the providing CLF unit and Anzac. Interestingly the charge provided had to be exchanged at short notice due to the wrong Department of Defence identification code (DODIC) being used albeit with the correct nomenclature. Again this evolution was conducted efficiently, the result of a particularly supportive USN Logistics agency.

Weapons delivery

Perhaps the most interesting of deliveries was the planning that went into the attempted delivery of Darwin's replacement 9-mm pistols. These weapons had been delivered to Fujariah via a RAAF C130. The weapons were then to be delivered to Darwin. The LSE team in Fujariah facilitated the overnight secure stowage of weapons and the delivery of the cargo to Kuwait. In the first attempt the cargo ended up in Jordan. Once delivered safely back to Fujariah the second attempt required an ADF sentry to accompany the cargo to its end destination. The lucky volunteer was the LSWTR responsible for the office management in the LSE office in Dubai. This delivery operation went off without a hitch until the USN aircraft touched down in Kuwait and was immediately under threat of what appeared to be a biological or chemical attack from Iraq. The flight crew and our sentry went to MOPP 3 and sheltered in the nearest SCUD bunker until the all clear was sounded. Due to the possibility of further attacks the aircraft immediately departed Kuwait again for Fujariah, again with the cargo

embarked and with no opportunity to offload. At the time of writing this submission the author is still unsure of the status of the pistols.

Interface with Australian Diplomatic Missions

Perhaps the most understated support organisations in the theatre of operations were the Australian Embassies. The maintenance of close liaison and extensive information flow was the key to the success of the logistic support processes thoughout the AO. Diplomatic clearances for units to visit any and all ports whether it was for recreation or maintenance had to be cleared and processed through the Embassy responsible for the port to be visited. For the Gulf Region responsibility for countries was:

- Australian Embassy Riyadh (Kingdom of Saudi Arabia)
 - Saudi Arabia
 - Kuwait
 - Kingdom of Bahrain
 - Sultanate of Oman
 - Jordan
- Australian Embassy, Abu Dhabi, United Arab Emirates

Both the Embassies had accredited Defence Attaches that provided outstanding support, often at short notice to requests submitted by the LSE. More often than not these DAs and their staffs were the unsung heroes in ensuring the processes were in place in time for, yet again, another seamless operation.

LSE management

Perhaps the hardest lesson learned was the requirement to ensure the team remained safe in an environment that had substantial unknown potential threats attached. Living and working in the local community, outside a secure compound left me in no doubt that the team was always under possible threat. The evening of 26 March 2003 was notable when an explosion of unknown origin occurred adjacent to the US Navy Support Activity in Bahrain. Alarms were sounded and the text message to prepare for a possible biological or Chemical attack was received. After all the Biological and Chemical preparations and training undertaken by the team, I had the ignominious honour of having to urgently return to my accommodation to collect my individual protective equipment (IPE), having removed it from my vehicle that afternoon. While the alarm turned out to be false, it could very easily have been real.

The most memorable activity was the

opportunity to work with such a group of professional and motivated personnel. Without exception the LSE staff was willing to provide what was needed to ensure the RAN units and any other group were provided the best available level of support. The team worked tirelessly, particularly as the buildup to operations continued through February and March 2003. Six months is a long time in any calendar and with seven day a week operations, little if any opportunity to take a break and the occasional "lockdown" brought about by regular upgrades of the threat conditions, the team was required to continue to provide the service.

The LSE motto of *Absolutely Anything*, *Anywhere* was tested with great success on numerous occasions.

Conclusion

The opportunity to be part of both the planning and implementation phases of an operation provided this officer with an extraordinary experience; the likes of which do not often occur. The range of logistic support activities and processes that were undertaken during my tenure as Commander LSE covered the conceptual, planning and implementation phases of an operation. I was particularly fortunate to not only be part of such a complete planning process but also to work alongside some outstanding personnel.

In closing, the effectiveness of the LSE during Operations *Bastille* and *Falconer* was in no small part due to the efforts of previous Commanders and staff of the LSE since Operation *Slipper* commenced in 2001. Without a robust foundation the LSE may not have been able to provide the range and depth of support needed. I thank Lieutenant Commander Miko and Commanders Sparkes, Williams and Mierisch for their efforts in laying the foundations.



SEMAPHORE

Sailing into the Future

(Issue 10, 2003)

The international security climate has changed dramatically since the end of the Cold War, and particularly over the last two years, forcing a major re-think of our security situation. We are facing a world much less certain and stable than before, and the Asia Pacific region is not immune from these changes. The Government now clearly expects the ADF to be far more pro-active in dealing with potential threats, moving from a focus on the direct Defence of Australia to a more With this renewed expeditionary outlook. emphasis on meeting trouble before it gets to our shores, a strong Navy remains critical to our national defence. Maritime Power has been an indispensable feature of almost every Australian military operation since 1901. Much of this has been transparent to the outsider, but maritime power has been, and remains, absolutely essential to virtually all Australian military operations.

For Australia the strategic influence of the sea is all encompassing. The sea permits direct or indirect attack on Australia's national interests from every direction. Australia's reliance on the sea for trade and economic well being is absolute. resulting in greater globalisation With interdependence of national economies, great harm could be done to the economy and the people of Australia by even low-level warfare or asymmetric threats against Australian trade or interests at a distance from our coastline. Control of the sea is not only axiomatic to the protection of trade but for the projection of power from the sea. In a maritime environment power can only be projected from the sea if a nation can assert power over the area of the sea that is required to support the operation. The growing importance of the sea in the Asia-Pacific region is reflected in the rise of regional naval power, which indicates that the value of maritime power is being recognised by many countries as a critical factor in their development.

Given the maritime and littoral nature of Australia's strategic environment, *sea control* is vital, and the ability to gain and maintain sea control must be the basis upon which the Navy is structured. Sea control is that condition that exists when one has freedom of action to use an area of the sea for one's own purposes for a period of time and, if required, deny its use to an opponent. It is a relative rather than absolute concept. That is, you only need the degree of control required to achieve your mission, and only for the time taken to achieve your mission. Sea control is multidimensional, applying not only to the sea surface, but also to the water column and seabed, the air and space over the sea, and the adjoining land areas that influence the sea. Air and land forces are thus integral to the concept of sea control. Control of the air and the adjoining land areas, particularly in choke points and other key littoral zones, is critical.

Unfortunately, much of the benefit of maritime forces is not always apparent, and so does not feature in the public's perception of national security. Operations such as blockades may continue quietly for many months before becoming effective, and critical efforts to lines of uninterrupted sea maintain communication to support land campaigns are usually forgotten when looking at the land campaign itself. Australians rarely realise that without sea control we could not have sent the ANZACs to Gallipoli, defended New Guinea in WWII, or operated in East Timor.

There are essentially three broad categories of tasks that maritime forces can undertake diplomatic, constabulary and military. The RAN has seen a major increase in the tempo and range of operations in all three categories over the last ten years. Clearly the constabulary roles are an increasing focus for the Navy, with ongoing border protection activities, drug interdiction and fisheries patrols all being high profile and demanding requirements. A high level of diplomatic activity has been sustained, with visits, exercises and peace support activities. As with the Army and RAAF, and as has been recognised by the Government, naval forces structured and trained for military warfighting roles can undertake the less demanding diplomatic and constabulary ones, but the reverse is not true. Hence the RAN must be structured for warfighting, as the defence of Australia and its interests, is and must remain, the ADF's primary concern. Consequently, we need to maintain highend warfighting capabilities within a balanced fleet of surface ships and submarines and the ability to coordinate with airborne assets and land forces to ensure control of the airspace and sealand interface. We must structure to suit our own national needs, but some specific high-end naval capabilities, that are both critical for Australia's security and fully interoperable with coalition partners, are essential.

There are some key characteristics of seaborne forces that must be capitalised on to maximise our

national security. The first is mobility in mass. Even a moderate sized ship can carry a far greater payload than an aircraft. Although slower than aircraft, ships are much faster than land forces, a key factor in littoral manoeuvre operations. Thus ships will remain the primary method of transferring the bulk of equipment and personnel. augmented by air movement for time-critical activities. Secondly, ships have both reach and presence. By carrying most of their logistic requirements with them, and deploying with dedicated replenishment and support vessels, a task group can operate for extended periods at long distances from shore support. The carrying capacity of ships also mean they can provide significant logistic support to land forces, minimising the footprint ashore. Additionally, ships do not need host nation support to operate away from Australian territory. Thirdly, readiness is also a key attribute. Ships can be ready to deploy in a contingency at very short notice. Fourthly, their *flexibility* means they can undertake a variety of roles, often simultaneously, during the same deployment. They can shift from the most benign of activities to offensive action with virtually no warning. Finally, modern warships possess resilience, being designed to withstand significant damage or defects when coupled with well-trained crews. These attributes are critical in the Multi Dimensional Manoeuvre Concept that the ADF has recently endorsed for the future.

So where is the Navy heading in the future? Force 2020 and the Future Warfighting Concept, detailing how we expect to fight by 2020, envisage the ADF operating as a truly seamless force, with tailored capability packages networked together to complement each other. The key enabling concept emerging is that of Network Centric Warfare (NCW), which aims to link the sensors, weapons and command and control systems of a force together into a seamless package. For the Navy the NCW future will largely be an evolution of the way we already conduct business, utilising the same principles, but with greater bandwidth, automation and function transferability.

The RAN clearly needs to be able to operate autonomously at significant distances from Australia and to support the Government's requirements to transport, protect and support land forces on extended operations in our immediate region and broader area of interest. While this most obviously requires amphibious sealift and afloat support ships, it is critical that the RAN retains a balanced fleet to provide for the sea control that is essential to achieve success in *any*

offshore operations. The vision for 2020 is for a fleet of surface ships, aviation assets and submarines that have the ability to facilitate control of the maritime battlespace, in close cooperation with the RAAF and Army. At the heart of this force will be an air warfare capable destroyer or more correctly termed, a Sea Control Combatant (SCC), working with the Joint Strike Fighter, Airborne Early Warning & Control aircraft, Air to Air Refuelling aircraft, and Army Ground Based Air Defence assets, to maintain control of the air and provide air defence for an ADF task group deploying from Australian shores. Aircraft are obviously key components of this vision, but our geography places clear limitations on land based aircraft operations. Although forward bases in other countries will always be our preferred option, we cannot assume they will always be available or defendable, and a capable SCC will provide a high level of air control even in the absence of continuous aircraft support.

The SCC, whilst having a strong air warfare bias, will not, however, only be used for air defence. They will be our primary surface combatants and will deliver a range of capability options to the ADF. Capable of operating at the highest end of the conflict spectrum, they will contribute to activities for the direct defence of Australia, operating in the region, or globally as part of allied coalitions. The utility of these vessels means that they will be critical used across the full spectrum of maritime operations from diplomacy through to full-scale combat operations. They will also be the mainstay of our sea-based strike and air warfare capabilities, as well as having significant surface, undersea and electronic warfare abilities. They will be true multi-role platforms, fully interoperable with our major allies, key ADF assets to assert sea control. and absolutely essential to any ADF led operation offshore. The SCC will be supplemented by other surface combatants. The Anzac class frigates and any follow on surface combatants will need to be capable of working in the littoral environment as well as independently in the open ocean. RAN surface combatants must increasingly be able to deliver firepower further inshore in support of land operations, particularly during the vulnerable initial stages of a landing.

As the ADF becomes more expeditionary in its outlook, the Navy will have the key role of transporting, protecting, landing and supporting land forces in the littoral. Work is already well advanced to introduce up to three large replacement amphibious ships, which will obviously need excellent range, good speed and self-protection capabilities. Importantly, these ships, in conjunction with replenishment ships, will have a significant role in supporting as much of the landing force infrastructure as possible, in order to minimise the footprint ashore. All these developments would significantly reduce the burden of both getting assets ashore and then supplying and protecting them. This 'sea basing' concept entails having as much of your force as possible at sea, only landing what you need to do the job ashore, when and where you need it, and is something the ADF should closely investigate.

Submarines will become increasingly networked and integrated into our task groups, and hence increasingly useful in the joint environment as well as their current individual roles. Unmanned Underwater Vehicles and Unmanned Aerial Vehicles have a potential that needs to be exploited in the future to significantly reduce the risk to our people. They will be deployed from both surface ships and submarines in a variety of surveillance and warfare roles. The mine warfare capabilities again proved their worth during the Iraq War, and will remain a potent force into the future. A replacement capability is required in the 2020 timeframe. Finally, patrol boats are the mainstay of our constabulary force, and the requirements for the surveillance and response capabilities that these ships provide will inevitably increase over the coming decade.

The maritime strategy that we need for Australia's security relies on a strong, capable and balanced Navy, and in the increasingly uncertain times ahead we must have the ability to gain and maintain sea control. We must retain some cutting edge capabilities to be able to operate independently with an acceptable chance of success, as well as to contribute in a real and practical way to coalition operations. In short, land forces, embarked forces, naval assets, aircraft and command elements must be networked so everyone has the same picture, and the best placed assets, regardless of service, are tasked to deal with situations. A truly seamless force, able to work with the Army, RAAF and our allies to provide a total force package, is fundamental to meeting the strategic tasking of the Government. This is a summary of a speech to the USI on 6 August

2003 by VADM C.A. Ritchie, AO, RAN.

Australia's needs for maritime area air defence

(Issue 14, 2003)

Any operation undertaken by the ADF will necessarily rely heavily on Sea Power and maritime transport to move, protect, project, support and sustain troops and equipment, both in transit and when in an area of operations. This clearly requires the ADF to be able to gain and maintain Sea Control and Control of the Air to allow us to use an area for our own purposes for a period of time and, if necessary, to deny its use to an adversary. As an island nation, this control will be critical for *all* ADF operations offshore and even for most operations on Australian territory.

Control of the Air is defined as that ability to use the third dimension and the surface below it, without being threatened or attacked by an opponent's air power. It is the prerequisite for successful military operations, both in attack and defence, in the presence of a hostile air threat.¹ *Sea Control* is that condition that exists when one has freedom of action to use an area of sea for one's own purposes for a period of time and, if required, deny its use to an adversary. This includes *the air space above*, the water mass and seabed below, adjoining land areas, and the electromagnetic spectrum.²

The current Surface-to-Air Missile systems in RAN ships are no longer capable of ensuring Control of the Air, nor of defending against most modern Anti-Ship Missiles. RAN warships can provide only limited protection for themselves, and offer little ability to provide air defence for other high-value assets such as amphibious/sealift ships carrying Australian troops. There are a number of highly capable and modern combat and weapon systems that do provide an excellent air defence capability over a much wider area. It is essential that such a capability be included in the Navy's new destroyers if the ADF is to develop the ability to successfully operate away from Australian shores.

To provide complete protection from an air threat, there is a clear requirement to be able to engage a threat as far away as possible. Protecting other dispersed units from air attack at long range is known as *Area Air Warfare*, as distinct from *Anti Ship Missile Defence* which refers to the close range protection (within 20km) of one's own ship. The RAN introduced an Area Air Warfare capability with the *Perth* class guided missile destroyer (DDG) in the 1960s, however these have all now decommissioned.

The Adelaide class guided missile frigates (FFG) currently in service use the same Standard SM1 missile as the DDGs. First developed in the 1960s, the SM1 has a nominal range of 50km. Modern regional anti ship missiles can now be fired from aircraft well outside that range (in excess of 120km) and many can out-manoeuvre the SM1 missile. Additionally, the FFG can only engage two air targets simultaneously, whereas many countries increasingly have the ability to

program multiple missiles, fired with impunity from outside SM1 range, to arrive simultaneously and swamp a ship's defences. Furthermore, the SM1 missile requires a dedicated Fire Control radar to illuminate the target throughout its flight, which provides warning to the aircraft that it is being targeted and gives the pilot time to evade. In addition to these technical limitations, the SM1 missile is no longer in production and consequently the system has a limited support life.

There are a number of future ADF capabilities being developed to facilitate Control of the Air. These include the new destroyer (the so called Air Warfare Destroyer), the Joint Strike Fighter (JSF), Air-to-Air Refuelling (AAR) aircraft, new Airborne Early Warning and Control (AEW&C) aircraft, Over the Horizon Radar (OTHR), and new generation Army Ground Based Air Defence (GBAD) systems. It is critical that these capabilities work as a complementary package, as no single capability will see its potential maximised working alone. The concept of Network Centric Warfare (NCW) provides connectivity between these assets to share tactical and targeting information and ensure that the whole is greater than the sum of the parts.

Importantly, an Area Air Warfare combat system in the new destroyers will act as a force multiplier, by allowing surveillance aircraft to operate over a much wider area. The extended range of the destroyer's missile envelope means that such aircraft can operate independently, then safely retreat under the protective umbrella of the ship once an emerging threat is detected. This will enable them to operate effectively even in situations where fighter escort is unavailable, which will significantly extend the surveillance capabilities of a deployed Task Group and free up the JSF to conduct other tasks.

Modern Area Air Warfare systems, such as the AEGIS system employed by the US, Spain, Japan and Korea, have a true Area Air Warfare capability. The *current* generation of missile used by these systems - the Standard SM2 - has a range in excess of 160km, allowing hostile aircraft to be targeted and destroyed well beyond the range of most anti-ship missiles, such as *Exocet* and *Harpoon*. This allows them to not only provide for their own protection, but to protect friendly maritime, land and air assets operating over a large geographical area. Moreover, the SM2 missile is far more manoeuvrable than the SM1 and modern high performance combat aircraft, improving the probability of interception.

The Phased Array radar technology incorporated into these systems has fixed antennas that allow the radar beam to be electronically

steered to any point in space. The radar is controlled by the combat system to foces its search in areas of highest threat, or where targets have already been detected. This permits a much higher update rate of areas (and targets) of interest and allows the radar to accurately track both the missile and target and to pass updated orders to the missile in flight. It also permits up to 14 targets to be engaged concurrently which will counter the simultaneous arrival of multiple antiship missiles discussed earlier. Furthermore, the system only requires the target to be illuminated with Fire Control radar in the final few seconds of homing, which means that it does not have advanced warning that it has been engaged. Further variants of the SM2 missile will enter service in the next 5-10 years that have even greater utility; including a significant capability over land. This will be important in providing Control of the Air for land operations in the littoral, with the ability of the ship to integrate with the Army's ground based air defence systems.

Advanced Area Air Defence combat systems also have upgrade paths to allow the full potential of the next generation of missiles to be realised, some of which may be used for Theatre Ballistic Missile Defence. While the Government is yet to decide on whether this capability will be required by the ADF, and it is not a driving force behind the requirement for an Area Air Warfare capability, it is an attractive benefit. A further advantage is the potential to remain fully interoperable with key allies, particularly the US and UK. This provides a niche capability that is similar to that fielded by the US, and which can be easily upgraded by leveraging off US technological developments. This is very much in our own interests as well as those of any coalition, and will provide the Government with further options to provide a meaningful (rather than symbolic) contribution to high-end coalition operations.

On 7 November 2003 the Government announced the outcome of its review of the Defence Capability Plan (DCP) in light of changes to the strategic environment, recent operational experience and more mature costings. In recognition of the need to enhance the protection of troops being transported and deployed from air attack, the RAN's air warfare capability is to be substantially enhanced. Four of the *Adelaide* class FFGs will be upgraded with SM2 missiles to increase their air warfare capability. In addition, three new destroyers will be acquired, incorporating the SM2 missile and a combat system probably derived from the AEGIS

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system currently in operation with the USN. This will provide the ADF with a capability to detect, track and engage simultaneously multiple aircraft at ranges in excess of 150km. To offset these enhancements, the two oldest FFGs will be laid off from 2006 when the last of the *Anzac* class frigates is delivered.

Clearly, the optimum solution for ADF Area Air Warfare is a complementary package of ships, GBAD, JSF and AEW&C aircraft. However, Australia's geography and the increasingly mobile focus of short-notice ADF operations mean that surface combatants may be the only assets available to project power over a large area of operations. Additionally, ships operating in international waters may often be the only politically acceptable option for the government to use in a tense situation without the risk of escalation. In essence, the Navy's new destroyers will often be the only ADF assets with the range. capability and attributes to ensure both Sea Control and Control of the Air in many of the areas the ADF is expected to operate in. The Government's decision means that the Navy's next generation surface combatants will have a robust, modern and highly capable Area Air Warfare capability, providing the ADF with a credible ability to gain and maintain Sea Control and Control of the Air.

Timor Sea oil and gas - too valuable to ignore?

(Issue 4, 2003)

The Timor Sea is an area rich in natural resources including fish, sea cucumber, oil and gas. For this reason there has been much political and legal debate over the allocation of exploitation rights to the area with Australia, Indonesia and East Timor all claiming rights to a proportion of the resources. Of all the resources in the Timor Sea, oil and gas will provide the region with the greatest long-term benefits. This has resulted in protracted negotiations to determine maritime boundaries between these three countries, which have been resolved through a series of bilateral treaties.

The Timor Sea Treaty between Australia and East Timor is the most recent and a particularly good example of the nature of the negotiation process. East Timor's independence from Indonesia saw the annulment of the previous Timor Gap Treaty between Australia and Indonesia, which established a three part Zone of Cooperation (ZOC) opposite the East Timorese coastline. The annulment of the Timor Gap Treaty reopened the debate on the delimitation of the boundary as Australia and East Timor both claimed rights to the ZOC. Each country's claims could be argued under international law and the matter was resolved by establishing the Joint Petroleum Development Area (JPDA) under the Timor Sea Treaty (see Figure 1). The Treaty allocates 90% of the revenue from the area to East



Figure 1: Timor Sea JPDA

Timor and 10% to Australia.

The resources in the JPDA amount to almost 12 trillion cubic feet of gas and 900 million barrels of oil. At the moment, oil is currently being processed and exported from the JPDA. The majority of the gas resources, which are still in the development phase, are located in the Bayu-Undan and Greater Sunrise deposits. These gas deposits will have a significant impact on the region's petroleum industry. Australia stands to gain \$4 million a year from Greater Sunrise and \$2 billion in total revenue from Bayu Undan. Depending on how the area is developed, downstream financial benefits to Australia could be as much as \$22 billion, including the provision of up to 20,000 jobs in the Northern Territory. The resource sharing arrangements under the Timor Sea Treaty will underpin East Timor's economic development for the foreseeable future and are therefore vital to that country's survival

The Treaty establishes detailed arrangements for the administration, exploitation, managements

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and protection of the JPDA. Included in these arrangements is the requirement for surveillance and patrols of the area to be conducted in order to protect the resources. East Timor does not currently possess an air force, and has no plans of developing one in the near future. Similarly, East Timor's navy comprises two *Albatross* Class Patrol Boats, donated by the Portuguese government. Australia's youngest neighbour, therefore, has no real capability for contributing to patrols. Therefore it will fall to Australia to conduct patrols of the JPDA in order to protect these vital resources.

Australia undertook patrols of the ZOC, under the now defunct Timor Gap Treaty. These patrols ceased when East Timor gained independence from Indonesia and the treaty was annulled. Since then. Australia has continued to conduct patrols in and over Australia waters, up to but not including the JPDA. The ratification of the Timor Sea Treaty has reopened the door for surveillance and patrols of the JPDA. These patrols are yet to occur. Foreign fishing vessels and suspected illegal entry vessels receive the highest priority. The region's current strategic situation is constantly changing and has seen an increase in the emphasis placed on the potential for terrorist activity. This may require JPDA resources and facilities to be protected.

The economic importance of the JPDA to both Australia and East Timor should not be underestimated. Not only will the resources primarily underpin East Timor's development, they also have the potential to turn Darwin into the region's major petroleum producing centre, However, the JPDA resources and facilities are as vulnerable as they are valuable. The installations used to extract oil and gas in the JPDA include Floating Petroleum Storage and Offloading facilities (FPSOs), tankers converted for the task. FPSOs are located adjacent to oil and gas fields and are moored to the seabed using a system of lines and anchors. Their large size and fixed position makes them inherently vulnerable to attack from small, agile craft. Tanker and support vessel traffic will also increase in the JPDA as development and production continues. This traffic is similarly vulnerable to attack during close manoeuvres and also while docked.

Maritime terrorism has become an issue of international importance in recent years since the attacks off Yemen on the USS *Cole* in 2000 and the MV *Limburg* in 2002. The suicide attack on the *Cole*, which occurred while the ship was refuelling, killed 17, injured 39, and caused significant damage to the ship. The explosive packed speedboat that rammed the *Limburg*

Maritime terrorism is not restricted to the waters in the Middle East. Abu Sayyaf and the Moro Islamic Liberation Front (MILF) are two separatist terrorist groups active in the Philippines since 1991. Abu Sayyaf has a strong history of abducting foreign nationals for profit and publicity. MILF has perpetrated attacks against shipping, primarily domestic ferries. In addition, Al-Qa'eda, which has been linked to terrorist organisations in Southeast Asia such as Jemaah Islamiah (JI) and Abu Sayyaf, has made specific threats against the global petroleum industry. Despite the lack of immediate threat to JPDA facilities, the pre-existence of maritime terrorism in the region, and links between Al-Qa'eda and regional terrorist organisations, creates the potential for unexpected attacks. This should be taken into consideration when tasking maritime surveillance operations, particularly given planned developments in the JPDA.

Southeast Asia, and Indonesia in particular, continues to be a haven for pirates. Of the 374 reported cases of piracy across the world last year, 103 were in Indonesian waters. The majority of these occurred when the target vessel was either at anchor or in port. While the bulk of these attacks are cases of theft, a number were hijackings. In most cases pirates used small vessels to carry out their attacks, typically gaining access via ropes or anchor chains. The attack on the *Limburg* has shown that maritime terrorists need only behave like pirates to achieve a successful attack against shipping in Southeast Asian waters.

Large numbers of small fishing vessels frequent the JPDA. These vessels often sail quite close to FPSOs, and have been known to approach the rigs seeking assistance and supplies. FPSO crews would have a great deal of difficulty differentiating between an innocent fishing vessel and a pirate vessel, and therefore may not have the opportunity to request assistance or otherwise prevent the attack. Furthermore, FPSO crews have neither the capacity, nor the authority, to carry weapons to defend themselves against such attacks. The JPDA's remote location means that the time required for a response would reduce its ineffectiveness. The JPDA is therefore a soft target and very vulnerable to terrorist attack.

Early detection remains the best method for preventing terrorist attacks. Surveillance capabilities, such as the Jindalee Operational Radar Network, enable Australia to monitor its sea and air approaches, allowing incoming craft to be detected, but not identified, well before they

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reach Australia. Surveillance data of this type allows surface response craft to be deployed to identify suspect craft, and if necessary, intercept them as they enter Australian territorial waters. This type of technology enables Australia to protect and defend the JPDA.

Navigation safety zones are established around every petroleum installation in Australian waters, including the JPDA. These zones prohibit unauthorised vessels from entering within 500m of an installation. They provide Australia with the ability to prevent potentially dangerous craft from approaching valuable oil and gas installations and causing damage through either attack or accidental collision. These zones therefore constitute a very useful legislative tool for protecting the JPDA.

The emergence of global terrorism, and its impact in the region, has caused Australia to review its strategic policy in the region. In the light of developments in the JPDA, Australia should continue to regularly examine its strategic outlook and patrol priorities in order to ensure that this valuable area remains protected in the future. *This is a summary of SPC-A Working Paper 13 - The Timor Sea Joint Petroleum Development Area Oil & Gas Resources: The Defence Implications.*

Iraq lessons: the more things change... (Issue 6, 2003)

Echoing earlier wars, the successful conclusion of combat operations in Iraq has brought with it the expected flood of analysis from defence commentators. Within Australia there have already been calls to cancel or reduce the scale of some planned capabilities while accelerating the adoption of others more appropriate to a seamless transitioned force. Although the term revolution in military affairs (RMA), appears to have fallen from prominence, the Second Gulf War has evidently witnessed such a revolution, one which has delivered such a devastating shock to traditional notions of Australia's military that it is now set to sweep aside years of military culture.³ Even the notion that Australia's security interests are determined by geography has now been firmly repudiated.4

The media may rapidly pick up on such themes, but they tend to lack both understanding and depth of analysis. The classic example from 1991 was the emphatic, *Gulf Lesson One is the* value of air power, attributed to the US President, but thereafter adopted by those seeking to address Australian security concerns with a silver bullet. The 2003 version may well be *Network-Centric Warfare is the warfare of the future* because, we are informed, *the game is different in the* *networked environment.*⁵ The e-battlespace is obviously vital, and there is a strong case for the better linking of remote sensors and platforms, but some commentators seem either too ready to confuse the means with the desired end or are unaware of the need for a more considered approach to the spectrum of ADF operations.

The ADF is not simply a cut-down version of the US military, and concepts of transition applicable to a global power should not be adopted in isolation, nor used to obscure the unique nature of our circumstances. For example, the RAN's limited number of warships are often required to undertake a far wider and more nuanced mission than their USN counterparts. The influence of geography on Australian security can likewise never be ignored, simply because Australia endures as a physically large and widely dispersed maritime nation, one for which any possible military movement, either as threat or contribution, must travel on, over or under the sea. Information, vital though it is to the allocation of assets, cannot directly substitute for physical presence. What use a future ADF that has misjudged the balance between systems and equipment to the extent that it cannot afford sufficient platforms?

Similarly dangerous is the belief that technical solutions may somehow replace a robust operational doctrine founded on many years of experience. Although the Navy is a technologybased organisation, our appreciation of these technologies is firmly rooted in the historical perspective. Our tools must never be allowed to drive the way we need to fight. As Dr Andrew Gordon has argued,6 the purveyors of a new technology almost always oversell the revolutionary nature of their deliveries, offering untested certainties while holding back on vulnerabilities. No matter how good the preparations, the practice of warfare will never be perfectly rational, and hence there is no substitute for the inherent flexibility of a well-trained, disciplined force which has managed to get its culture, doctrine and practices lined up with its operational tasks. In fact, while the character of conflicts may change, the deeper one looks the more certain it is that the enduring principles of war have changed hardly at all.

This would all come as no surprise to any student of naval history and strategy. More than a century ago, Rear Admiral Mahan attempted to define the principles of sea power in an age of technological transition. He recognised the influence that control of the sea exerted on campaigns and understood that the principal impact of technology was on tactics and that, 1

while strategic and doctrinal ideals may be modified by scientific developments, they will not be fundamentally altered.⁷ In consequence, success in the 'warfare of the future' is likely to be just as firmly based on a willingness to accept risks, a preparedness to use one's initiative, and the ability to recognise when a decisive moment has arrived. This requires a warfighting and cultural ethos that goes far beyond systems management.

To better illustrate these enduring features, one might point to the use of naval gunfire support (NGS) on 21-22 March 2003, during the Royal Marine (RM) assault on the Al Faw Peninsula. The USN had employed battleship NGS with considerable effect in 1991, but by 2003 the battleships had long gone and the USN had built up a measure of institutional resistance to the task, preferring instead to rely on air delivered weapons. Reinforcing this perception, the USN's cruisers and destroyers, although still mounting a 5-inch gun, were physically and operationally unsuited to the navigational constraints of Iraqi coastal waters. The RAN and RN, by contrast, gave an NGS capability far more prominence and possessed ships in the Gulf ideally suited to the mission. Indeed, HMAS Anzac was arguably the most effective ship available, both in terms of mounting the most powerful gun and in carrying the most ammunition. Equally important, the RAN's long-term presence in the area meant that its understanding of the littoral environment was unsurpassed. In consequence, the USN Commander was persuaded to preserve the NGS option, a decision vindicated by the manner in which events unfolded.

Not only did poor weather and competing tasks restrict the use of tactical air support during the RM assault, but Iraqi beach mining also hampered the landing of artillery and light armour. As such, the four warships poised offshore undertook a more vital than expected role, providing highly accurate and responsive indirect fire for 48 hours rather than the originally planned 24. Of particular note was the aggressive yet restrained way in which this support was used. With dumb rounds relatively inexpensive - in comparison to precision guided munitions - and a sensor to shooter response time measured in seconds rather than minutes, it was possible to provide a finely tuned psychological as well as a physical effect. Targets could be rapidly shifted as the tactical situation evolved and at times this meant that, even in well-protected positions, enemy troops could be encouraged to surrender or moved in a particular direction. The ships were later advised by 3 Commando Brigade that their gunfire had

had a huge impact on the ground and shattered the enemy will to fight.

NGS is hardly a new technique, but it is difficult to imagine a better means of offenne such a swift, persistent, economic and most importantly, measured means of response. The lesson, however, is not that one capability is more effective than another, but that a commander must possess a range of capabilities that can be adapted to provide the desired effect in the circumstances that exist at the time. Having established sea control, Australia's deployed maritime assets were able to operate successfully in a multi-threat environment, and were simultaneously employed on multiple tasks ranging from air and surface defence to surveillance and boarding operations. Our men and women consistently demonstrated their professionalism and initiative, while our ships exhibited the inherent characteristics of mobility, access, readiness, persistence and flexibility that continue to make maritime power the great enabling instrument. As Defence responds to demands for a radical cultural and equipment shift,8 we would do well to remember the need for balance, for some things do not change and, no matter how well networked, it is only the well-practised combination of people, hardware, and doctrine which can apply the effect.

Australian Maritime Doctrine

⁴ A Dupont, 'Straightjacket off as defence gets real' Australian, 27 February 2003.

Fundamentals of Australian Aerospace Power

M Forbes 'The lessons of Iraq are set to transform

Australia's military structure' Age, 3 May 2003.

See Forbes above.

⁶ D Stevens & J Reeve (eds), *The Face of Naval Battle*, Allen & Unwin, Sydney, 2003

⁷ A.T. Mahan, *The Influence of Sea Power Upon History 1660-1783*, Little Brown and Company, Boston, 1890

⁸ M Walsh & F Benchley, 'The Defence Matrix', Bulletin, 3 June 2003.

BOOK REVIEWS

The Strategic Importance of Seaborne Trade and Shipping

Andrew Forbes (ed) Sea Power Centre-Australia, Canberra, 2003 <u>spca.seapower@defence.gov.au</u> xx, 191 pp, softcover

The Strategic Importance of Seaborne Trade and Shipping, edited by Andrew Forbes, is volume No 10 in the RAN Sea Power Centre's excellent series Papers in Australian Maritime Affairs. It comprises the proceedings of the 13th International Conference on the Sea Lines of Communication (SLOC) held in Canberra in April 2001. Its broad objectives are to increase awareness of the significance of shipping and seaborne trade, to examine threats and the implications of disruption of shipping, and to develop an agenda for further cooperative initiatives to ensure the security of shipping and seaborne trade in the Asia-Pacific.

The strategic geography of the Asia-Pacific is dominated by the maritime environment. Countries in the region are heavily dependent upon unimpeded access to seaborne trade for their economic well being and national survival. The region has a number of strategically important choke points through which vital commodities pass, and which provide a potential focus for interdiction operations. Despite the local nature of these choke points, any harassment operations against shipping in these areas, or indeed anywhere in the region, will have a wide international impact with economic and political consequences.

The book is divided into five main sections dealing with regional seaborne trade and shipping, safeguarding of seaborne trade, implications of new technologies, new threats to shipping and seaborne trade, and the protection of seaborne trade and the role of navies. Each section comprises contributions by subject specialists, and hence the majority of papers are current and reflect well researched and analysed perspectives. There is a good balance between local and overseas approaches with contributions from India, Japan, South Korea, New Zealand, the Philippines and a keynote address by Professor Geoffrey Till from the United Kingdom.

The book provides a good compendium of recent information and analysis on evolving shipping patterns and vessel ownership, as well as discussion of potential threats and of the

complexities involved in effectively meeting such threats. Discussion of the role of navies and the development of cooperative initiatives are less developed in the book. Naval thinking on the protection of seaborne trade seems still to be firmly rooted in the experiences of the Second World War, and has not taken account of technological developments and the changed nature of seaborne trade in the last half century. As Geoffrey Till states: ... Western navies at least pay much less attention to the fourth arm of defence than they used to. The merchant fleets themselves are much less an element of naval power than they were. There are fewer prospects of serious attack in times of conflict - and very importantly there are much more important things for navies to be doing in this expeditionary age.

In the current strategic climate, the navies of the Asia-Pacific seem to have their interests firmly focused on sovereignty protection, and in some cases on power projection, while protection of trade languishes as very much an after thought. With the diminishing size and relative capability of navies, many no longer have either the capacity or capability to perform their priority tasks as well as trade protection. Indeed, within the Asia-Pacific it would seem that in major conflict only the United States and Japan would have either the capacity, or the appropriately equipped maritime forces, to provide for some direct trade protection. Other navies, such as those of Australia, China, Indonesia and Thailand, do not have ships with adequate capability to counter modern threats. In addition, small navies such as those of Australia, New Zealand and Singapore have limited flexibility to meet trade protection tasks.

Armed conflict is becoming more complex, and we are seeing it evolve from the form it took for much of the twentieth century. Contemporary armed struggles are not always between states with clear political and military objectives. There are often internal or intra-state conflicts consisting of uprisings, rebellions and terrorism and underpinned by historical grievances, religious differences, factional and territorial disputes, resource competition and economic friction. The changing nature of conflict means that shipping and its associated infrastructure may be at greater risk from both conventional and asymmetric threats in low level circumstances than from higher level inter-state conflict. As Geoffrey Till observes: It is hard to imagine circumstances in which one state might seek, or even be able, to attack the shipping of another globalisation

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would hugely increase the commercial and political penalties of trying to do so.

Responding to unconventional threats to shipping considerably complicates the task of protection, and will require liaison and coordinated action between defence, law enforcement and other government and civil agencies for an effective response.

The Strategic Importance of Seaborne Trade and Shipping gives valuable insights into the challenges surrounding this complex task. The protection task in future may well see naval forces playing a less central role than in the past. Indeed, where direct escort of strategically important cargoes is undertaken it is likely to involve coalition operations, owing to the limited capacity and capability of most Asia-Pacific navies and the potential international impact of any threat to shipping. Clearly, considerable work is required to provide effective cooperative structures - at both the international and domestic levels - for the future protection of shipping in the Asia-Pacific.

Reviewed by CMDR John Mortimer, RANR

Fatal Traps for Helicopter Pilots Greg Whyte

Reed Publishing, Auckland: 2003 395 pp, softcover, photographic illustrations, diagrams, bibliography, index RRP NZ\$65.00

A popular feature in the weekend Sydney Morning Herald invites readers to ask questions of a selfstyled expert on anything they wish. Topics vary from the apparently serious to the plainly facetious. It is a good read, A couple of months ago one correspondent came up with a query which the guru despatched unanswered into the 'too hard' basket: which kind of aeroplane is more dangerous if its engine(s) stop in-flight - fixedwing or rotary-wing (helicopter)? Your reviewer, responding with a visceral fear born of twenty years' experience as a military and civil aviation fixed-wing (i.e., normal) pilot, involuntarily cried out 'helicopter', a seemingly unprovoked and mystifying declaration which drew worried glances from around the cafe.

Setting aside the understandable disquiet of the café society, it is well-known within the aviation fraternity that helicopter flying is a black art. Until relatively recently, when computer-directed flight control systems began to make a mockery of aerodynamics, there seemed to be some justification for that primal belief. Fixed-wing aircraft were inherently stable - they wanted to go where you pointed them, and if you took your hands and feet off the controls their preference was to continue on the selected flight path. If the engine stopped most glided pretty well.

Helicopters, by contrast, are inherently unstable, with numerous moving parts all wanting to go off in different directions at the same time. Let go of the controls and it's anarchy. And if the engine quits and you aren't flying either fast enough or high enough to enable the main rotor (the source of lift, analogous to a conventional aeroplane's wings) to free-wheel at an rpm sufficient to generate enough lift for continued flight, then you're left sitting in a container with all the gliding characteristics of a brick. Even the publishers' promo for Fatal Traps for Helicopter Pilots fessed up: 'It's no secret that helicopters have more accidents than aeroplanes'. (We won't dwell on their Freudian slip that a helicopter might not be an aeroplane.)

Greg Whyte is an experienced helicopter pilot who has turned his hand to educating via writing. There is not a great deal he can do about the technology of the helicopters in widespread use, but he can work on the perennially weakest link in the total system - the human being behind the controls. People who understand what's happening to their aeroplane, and why, almost invariably make better pilots.

Whyte writes with a clarity that belies the technical complexity of his subject matter. Topics unique to helicopter operations which in the past have furrowed your reviewer's brow were illuminated with an ease which speaks volumes for the author's understanding of his subject and his lucid expression. Phenomena which appear regularly in accident reports from around the world such as retreating blade stall, dynamic rollover, over-pitching, mast bumping, tail rotor vortex ring state, engine failures (with the associated autorotation), and many more, are all covered. Expert description and analysis are complemented by illustrative accident reports, pilot anecdotes, and high-quality diagrams.

This excellent book has much to offer the aviation enthusiast who wants nothing more than to unravel the mysteries of rotary-wing flight. It has a great deal more to offer the classrooms of flying schools and the crew rooms of commercial helicopter operators, where it should be a mustread.

Reviewed by Dr Alan Stephens, UNSW-ADFA

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Desert Sands, Jungle Lands: A Biography of Major General Ken Eather, CB, CBE, DSO, DSC

Steve Eather Allen & Unwin, Sydney, 2003 Soft cover, xx, 236 pp, maps, photographic illustrations, notes, appendices, index RRP: \$35.00

Steve Eather, a distant relative of the subject of this biography, has written an interesting and informative addition to the literature on Australia's WWII commanders. Major General Ken Eather was among the first to volunteer for the 2nd AIF, and served throughout the war, rising from being a battalion to a divisional commander. For most of the War he commanded the 25th Brigade, leading it through the critical battles of 1942 in Papua, followed by the Lae-Ramu Valley Campaign and the invasion of Balikpapan. At War's end Eather commanded the 11th Division on New Britain, administering the territory and overseeing the repatriation of over 100,000 Japanese prisoners of war.

The author employs a narrative style to describe Eather's life and military career. Chronologically laid out, the major part of the book focuses on Eather's service in WWII. Opening and concluding chapters cover the nonmilitary periods of his life. The writing is clear and fast paced and holds the reader's interest. While it is at times overdone, the author skilfully employs excerpts from his subject's personal letters and diary. The result is a balanced illumination of Eather as a combat leader and also as a husband and father.

The work's most important contribution is the chapters that cover Eather's years as commander of 25th Brigade. Historians tend to overlook the intermediate levels of command, focusing instead on either the lower tactical level of platoons, companies and battalions or the higher operations of divisions, corps or armies. Desert Sands, Jungle Lands has therefore particular significance for the Australian military tradition. The war in the jungles to Australia's north was unlike that of the Western Front in WWI or North Africa in WWII. Instead of massed formations controlled by higher headquarters, Australian battles against the Japanese rarely involved more than a few thousand men controlled by a brigade headquarters. Eather and the other jungle brigadiers were front line combat soldiers in every sense of the word. Eather suffered the same hardships and risks faced by his men, while also coordinating and carrying through the struggle against a deadly and determined opponent.

While an excellent narrative story, Desert Sands, Jungle Lands could have been a better book. Its faults lie in the author's weaknesses as a biographer. All too often he does not dig deeply enough and leaves critical questions unanswered concerning his subject's development as a combat leader. For example, how did an amateur soldier such as Eather become such a skilled tactician? His pre-war military education as a militia battalion commander was, at best, notional. In 1940 Eather did attend British training schools in the Middle East, but at this time the British Army's tactical record was poor, and the utility and applicability of such instruction to the coming campaigns in the Pacific was questionable. The answer to this question has particular relevance to the present day Australian Army, and to joint operations, in areas such as officer selection, training and leadership, and warrants further investigation. But the author glosses over it by concluding that success and promotion were evidence of ability, without exploring its source.

At a few points the work is marred by the author's tendency to make assumptions without supporting evidence. He should also be aware that Palestine is not located in North Africa. But these are minor weaknesses which do not detract from the contribution of the book to the Australian story of WWII. It is recommended.

Reviewed by Dr Albert Palazzo, UNSW-ADFA

The Great Wall at Sea: China's Navy Enters the Twenty-First Century

Bernard D Cole US Naval Institute Press, Annapolis, 2001 288 pp, illustrations, index, footnotes, bibliography Price: US\$34.95 for non-USNI members

I don't like writing book reviews. Apart from anything else, I believe that any author deserves that his reviewer write from a position of some considerable knowledge of the subject. This reviewer is without that kind of expert knowledge of the PLA Navy. Consequently, this review approaches the book by asking whether it provides the interested but non-expert reader with a comprehensive introduction to and an appreciation of the PLA-N today.

Dr Bernard Cole, is Professor of International History at the National War College in Washington DC, and has published several works with a Chinese connection. He is also a retired USN Captain, with extensive sea command

experience and an entire career spent in the Pacific.

In *The Great Wall at Sea* he has produced a book which ranges from China's maritime heritage through to an assessment of the PLA-N's likely future. It also examines China's extensive maritime interests, describes the organisational, materiel and personnel makeup of the PLA-N, and explains China's approach to maritime strategy. The bibliography (with an emphasis on Western authors) and footnoting are extensive and useful in their own right.

Dr Cole's chapters on heritage, history and strategy show us a country with a very long maritime heritage grafted on to a predominantly continentalist outlook. He outlines clearly the waxing and waning of Chinese interest in maritime affairs over the centuries: an oscillation which, in his view, indicates that naval power has never been critical to the survival of Chinese regimes.

That this situation continues is very well argued by the author. He identifies the subordination of maritime interests since 1949 and their more recent struggle for greater acceptance as China itself has, perhaps almost unconsciously, become more reliant on the sea. He argues, however, that while Chinese maritime strategists now have a louder voice, they are unlikely to become predominant, and that there is no sign of the increased resources for the PLA-N, which would reflect this change.

While the PLA-N has been a coastal defence force for most of its existence, it has begun to expand its horizons in recent years. Dr Cole describes the operational consequences, as well as the growing acceptance of new Western theories of maritime war. In his view, the PLA-N is saying the right things but there is little evidence of action in support of the rhetoric. For Cole, the PLA-N still has much catching up to do in the technological realm.

This reviewer has often wondered if there is a body of Chinese maritime strategic thought such as that we have inherited, if only recently, from Mahan, Corbett and others. *The Great Wall at Sea* provides no evidence of anything like this. Instead, we are left with the strong impression of a navy reliant upon land forces for both its senior leadership and approach to strategy, at least until very recently. Dr. Cole points to the "lines on maps" approach inherent in the island chains strategy as being indicative of this shortcoming.

In two chapters on maritime territorial and economic interests, Dr. Cole provides the foundation for the recently growing Chinese interest in maritime affairs and in the PLA-N. Beginning with a reference to China's sensitivity about sovereignty claims, however tenuous they may be, he explains clearly China's approach to UNCLOS, its maritime territorial concerns, notably in respect of Taiwan and the South China Sea, and its determination to protect and promote its interests.

The author provides very useful explanations of the UNCLOS provisions of most interest to China, its approach to the treaty and in particular China's five reservations about UNCLOS. These are important for their clear indication of China's desire to make claims well beyond what is included in UNCLOS provisions. These claims relate both to sovereignty and the rights of innocent passage.

In describing these claims and their ongoing impact on neighbouring states, Dr Cole leaves no doubt about what he sees as a hard-nosed and even aggressive approach by China. He is also somewhat critical of Southeast Asian states for not uniting to deal with China on these issues. The criticism may be valid, but China has made it known that it will only deal with these issues on a bilateral basis.

One explanation for China's approach to maritime territorial issues may well be found in its growing reliance on the sea. Dr Cole lays out an impressive list of Chinese maritime interests and activities, from possession of one of the world's largest merchant fleets to being the world's biggest producer of seafood, with some 160,000 fishing craft. He also notes a growing reliance on offshore oil and gas and the prospect of much gas left to be discovered.

Equally significantly, Dr Cole identifies seaborne trade as a matter of growing significance to China, with 50% of the economy dependent on foreign trade, 90% of which moves by sea. China certainly has an interest in ensuring the free flow of such trade - an interest most manifest in home waters, but increasingly in more distant ones.

About half the book is devoted to the PLA-N itself. Here Taiwan and the USN loom large. The author points out repeatedly that determination to use force against Taiwan if necessary - and the consequent need to deal with the USN - underpins much PLA-N operational thinking and development.

Dr Cole's descriptions of the various fleet elements are illuminating. We get a realistic sense of the capabilities now available to the PLA-N. Even with the continuing addition of small numbers of modern Russian destroyers and submarines, the author argues persuasively that the PLA-N remains lacking in warfighting capacity. He notes the limited amphibious

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capability, the lack of priority for mine warfare, and the vulnerability to air threat of even the *Sovremenny* class destroyers. Limitations are also said to apply to the submarine and aviation components, both of which are dominated by aging equipment and (in the case of the submarine force) continuing difficulties in the development of indigenous nuclear powered boats.

In our efforts to guess at China's future ambitions for its Navy, there is a clue in that the Navy has only three ships capable of providing replenishment at sea and apparently no plans to increase the number significantly. This does not point to a Navy with genuine blue water ambitions - at least in the near term. The author also points to significant logistical challenges as well as problems with configuration control.

The chapter on personnel, training and education is intriguing. We are treated to a thorough explanation of the naval shore training and educational system as the PLA-N tries to come to grips with a growing demand for technically competent people, while confronting similar retention problems to those faced by most navies as the private sector in an expanding economy beckons. Dr. Cole's assessment is that the PLA-N is working hard to overcome its personnel problems. He suggests that its political officers are becoming increasingly HR&M staff, although the call for political reliability is still at least outwardly strong.

One of the most telling statistics in the book is the claim that PLA-N ships spend only about 24 days per year at sea and that Naval Air Force pilots get no more than 120 flying hours per year. This has clear implications for readiness, and the author notes that while there is recognition of the need for a new training regime, no major changes have yet been seen. Dr Cole notes a similar gap between the rhetoric on doctrine and the reality of actual naval capability.

Looking to the future, Dr. Cole argues that while China has ambitions for a blue-water navy with regional if not global reach, to achieve them it will have to make changes to resource allocation priorities of a magnitude not yet seen. He can see no such changes in prospect.

The blurb for *The Great Wall at Sea* claims that this is the first major study of the PLA-N in over fifteen years. For this reason alone the book is worth reading. The author admits that there is still much that we do not know about the PLA-N, a reality which impacts upon any study of the organisation. Nevertheless, Dr Cole has produced a very readable account of the PLA-N, of its development thus far and of its prospects. It will satisfy those who wish to become familiar with Asia's largest navy, and should provide an incentive to further reading for those who need more in depth knowledge. Recommended.

Reviewed by CDRE Jack McCaffrie AM, RANR

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