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Phone: (902) 494-6846
Fax: (902) 494-3825
Email: naval.review@dal.ca
Website: www.naval.review.cfps.dal.ca

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Photo: DND Photo by Cpl Dany Veillette, Formation Imaging Services Halifax

*HMCS **Ville de Quebec** leaving Mogadishu, Somalia to return to the Mediterranean after conducting anti-piracy operations.*

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Editorial: The Demise of Canadian Maritime Aviation?

Maritime aviation in Canada began more than 90 years ago when aircraft of the US Navy began flying anti-submarine patrols from what is now Shearwater. In the intervening years, priorities, service affiliations and uniforms have changed but the maritime aviation mission has stayed constant – aerial operations 'over the seas.' This is about to change and whether it is a change for the better remains to be seen.

On the positive side, two long-anticipated maritime aviation projects are approaching fruition. Both the fixed-wing CP-140 Aurora Incremental Modernization Project (AIMP) and the rotary-wing CH-148 Cyclone Maritime Helicopter Project (MHP) promise much-needed improvements in the operational capability of Canada's maritime aviation forces although they have lagged behind similar upgrades in allied forces.

A CP-140 ***Aurora*** *prepares for take-off in the early morning mist.*

The policy basis for maritime aviation, especially long-range patrol aviation, appears to have received a boost in the Canada First Defence Strategy which emphasizes a 'level of ambition' for surveillance of Canadian territory and its air and maritime approaches. The strategy also stresses the importance that the government attaches to Arctic sovereignty. The strategy even makes a commitment to the acquisition of three replenishment ships along with the eventual purchase of 15 destroyer/frigate replacements and 6-8 Arctic/Offshore Patrol Ships. Presumably, at least some of these ships will be equipped to accommodate Cyclone helicopters.

With all this good news, the future would seem to be bright. But there are difficulties looming on the horizon that may signal significant changes to Canadian maritime aviation. Whether these are the result of a considered change in policy or the death of a thousand cuts is not clear but the likelihood is that it is latter rather than the former.

The Harper government has tended to steer clear of public policy statements on defence and security matters. Its Canada First Defence Strategy, while promising much, delivers little from a policy perspective beyond restating the traditional Canadian defence priorities in different words. It is, in fact, an attractively wrapped procurement strategy which, while promising the Department of National Defence a stable funding envelope for the future, fails even to mention either the AIMP Aurora or Cyclone projects in its discussion of total defence spending. From a broader perspective, whether the proposed level of funding is sufficient for the proposed recapitalization of the armed forces is the subject of some debate and criticism.

The major difficulty that the Harper government faces in coming to grips with recapitalization is the Afghanistan operation. Leaving aside the significant personnel costs, DND is struggling to deal with the unanticipated materiel expenditures that Afghanistan has entailed. With Afghanistan (properly) being given the top priority within DND, the imperative has been to slash spending wherever possible, especially in those areas that are perceived to have little or no impact on the Afghanistan operation. Without a strong policy justification for their role, the result has been that both the AIMP Aurora and Cyclone are facing significant headwinds.

AIMP was originally intended as an avionics (Blocks I and II), sensor (Block III) and even standoff air-to-surface weapons upgrade (Block IV) for 18 CP-140 Aurora aircraft with an accompanying Aurora Structural Life Extension Project (ASLEP). In September 2007, it was announced that AIMP would be cancelled and a replacement airframe purchased at some point in the future. In December 2007, this decision was reversed and it was decided that 10 Aurora airframes would be modernized with Blocks I, II and III upgrades and the accompanying life extension package. The rationale for the initial cancellation of AIMP has never been made public but it is likely that the unanticipated cost was perceived as a threat to an already over-committed

departmental budget. The subsequent decision to upgrade 10 aircraft probably reflects a recognition of the costs of cancellation as well as, hopefully, a belated appreciation of the sovereignty role of long-range patrol aircraft.

While open-source information regarding the current status of AIMP is difficult to obtain, the recent announcement that 10 life extension kits have been purchased would appear to confirm that plans are on track to have 10 AIMP Auroras, upgraded to Block III status, continue to carry out long-range patrol duties both domestically and overseas until a replacement maritime patrol aircraft shows up in the 2020 timeframe. No public mention has been made regarding the future of the remaining eight Aurora airframes.

Although 10 AIMP Auroras are a significant improvement over none, it is difficult to understand the decision to reduce the size of the Aurora fleet in light of the avowed intention of the Harper government to defend Canada's Arctic sovereignty. While there are plans in place to provide a constellation of reconnaissance satellites along with unmanned aerial vehicles to monitor the Arctic and Canada's maritime approaches, these are long-term projects and will not deliver a meaningful capability for years to come. Furthermore, the lack of an established marine domain awareness policy means that each of these components of a maritime surveillance system will be treated in isolation rather than as mutually supportive elements. As part of this yet-to-be-established surveillance system, the ability of a significantly reduced Aurora fleet to perform its traditional patrol functions at a useful rate is questionable at best.

The same budgetary difficulties that have sliced the numbers of upgraded AIMP Auroras by nearly half appear to have posed problems for the Cyclone project as well. An unseemly public spat developed between the Department of Public Works and Sikorsky Aircraft in May 2008 over a delay in the Cyclone delivery schedule and a proposal by Sikorsky to upgrade the Cyclone. Thankfully, the debate went back behind closed doors and in a press release dated 23 December, an amendment to the contract with Sikorsky was announced which will provide for initial delivery of the Cyclone in November 2010 with final fleet delivery in 2013 and incorporate "valuable, cost-effective additional [unspecified] capabilities" – all to be funded from within the original project budget.[1]

Beyond the financial implications for the maritime aviation community posed by Afghanistan lies the question of whether there will be more such missions in places like Sudan, Pakistan or Haiti. In a recent article Douglas Bland concluded that there is no stomach within

Photo: Internet

Prototype of the Canadian Cyclone during trials.

the Canadian government (or public) for such missions in the future[2] but the possibility remains that external pressure may force Canada into such operations, even on a limited basis. With their vastly improved capabilities in intelligence, surveillance and reconnaissance operations, both the AIMP Aurora and the Cyclone fleets will become attractive assets for employment in non-traditional environments if the occasion arises.

While both maritime aviation fleets will face a complicated transition to their new platforms, the Sea King fleet is confronting a particularly daunting task in maintaining a relevant capability at sea while preparing for the conversion to the Cyclone. It is likely that the current number of embarked aircraft will be significantly reduced as the Sea King will be required to provide rotary-wing support for the 2010 Vancouver Olympics since Griffon helicopters, which would normally have provided the bulk of this support, have been assigned to the Afghanistan mission. Although the Olympics are of relatively short duration, the priority assigned to this event (mentioned specifically as a 'core mission' of the Canadian Forces in the Canada First Defence Strategy) will make the transition to the shipborne operation of the Cyclone all the more difficult.

Canadian maritime aviation is about to undergo a sea change with new platforms that can perform both traditional and non-traditional roles. While these capabilities are welcomed, it is entirely possible that both fleets will be drawn into new mission areas to the detriment of their core competency. As Canada has painfully discovered in the case of the Chinook helicopter, once a combat capability is discarded, it is difficult to regain. It is therefore incumbent on planners to embrace the capabilities promised by Canada's 'new' maritime aviation fleets while recognizing that the sometimes unglamorous traditional maritime aviation role of providing 'wings for the fleet' remains essential.

John Orr

Notes

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3rd Prize Winner of the 3rd Bruce S. Oland Essay Competition

An Undersea Identity Crisis: Evaluating Realistic Roles for Canada's Submarine Fleet

J. Matthew Gillis

A Royal Navy 'A' class submarine (circa 1954) in Halifax; these submarines loaned to the RCN were the beginning of the Canadian Navy's submarine branch.

*HMCS **Grilse** and the USS **Bugara** alongside in Equimalt in about 1971.*

Submarines have had a long history as unconventional and menacing weapons in the world's oceans. Yet Canada, a state which some may find great difficulty describing as either unconventional or menacing, has operated a motley fleet of submarines for several decades. The Canadian submarine service has drawn increasing ire and scrutiny from the public and politicians with growing maintenance costs and limited operability in recent years. Questions of utility also arise given apparent incompatibilities with new humanitarian and Arctic priorities.

For critics, a fundamental question remains unanswered: why has Canada continued to operate submarines despite these difficulties and an apparent incompatibility with Canadian policy? It must be noted that this essay does not search for reasons why Canada *should* operate submarines; many professionals have addressed this already. Instead, this article searches for 'realistic' motivations for why Canada operates submarines, and argues that the traditional reasons for operating submarines are largely absent from Canadian defence policy planning. This article concludes that constabulary and collective security needs are the predominant reasons for Canadian submarines. It also identifies a pressing need to address public relations deficiencies within the Canadian Forces and the federal government about the submarines.

The Status of Submarines in Canada

By the late 1990s, Canada's *Oberons* had arrived at the end of their operational lives and were replaced by four used British diesel-powered submarines (SSKs) of the *Victoria*-class (ex-*Upholder*-class). The submarines – HMCS *Victoria*, *Windsor*, *Corner Brook* and *Chicoutimi* – were delivered beginning in 2000 and since then have been plagued by a variety of problems, including leaks, dents, cracks and fires. The greatest setback was in 2004 when partial swamping caused an electrical fire onboard HMCS *Chicoutimi*, claiming Lieutenant (Navy) Chris Saunders' life and hospitalizing several others.

The fire revived debate in Parliament over the value and purpose of submarines in the Canadian fleet. Critics from the opposition parties accused the Liberal government of seeking "military capability on the cheap" and purchasing "obviously inferior submarines."[1] Yet by what measure did these Members of Parliament decide the failure of the *Victoria*-class program? The late David Perkins argued that politicians have never had friendly relationships with submarines. As he stated, "quality, combat capability and numbers were all sacrificed in the name of politics, unrealistic fiscal restraints and lowered expectations."[2] Perkins noted that the *Victoria*-class submarines had anti-surface missile capabilities removed and fire control and electronic counter-measure suites replaced with refurbished equipment from the *Oberons*, leaving combat capability partially hamstrung.[3]

> *Canada's submarines have perhaps most popularly been identified as constabulary units.*

Today, SSKs have fundamental difficulties in contributing to Canadian maritime security objectives. Arctic sovereignty gained prominence under Prime Minister Stephen Harper, yet the SSKs are excluded from under-ice operations due to limited submerged endurance. Upgrades to employ air independent propulsion (AIP) technology would rectify this disadvantage but the government has no intention of pursuing such an avenue. The SSKs are also excluded from participating in the Canadian Navy's non-combat and humanitarian endeavours. The navy has established a humanitarian tradition in the last decade in such operations as *Operation Apollo* (October 2001-October 2003 in support of US operations in Afghanistan), *Operation Unison* (2005, in response to Hurricane Katrina) and *Operation Toucan* (1999, in East Timor). SSKs lack the armaments, speed, crew, or equipment necessary to participate in human security and relief missions.

Contesting Theories on Canadian Submarines

Accepting Perkins' suggestion that Canadian governments have never viewed submarines favourably and the notion that Canada's submarines are incompatible with the government's two maritime priorities – the Arctic and humanitarian relief – what worth remains in Canadian submarines? This section presents the most prominent ideas explaining why Canada has operated submarines. In general, the submarines are seen to play three roles: (1) serving as active components of Canada's defence structure; (2) acting in a constabulary role; and (3) existing for the benefit of allies.

*A modernized **Oberon**-class submarine of the Canadian Navy.*

The thought of Canadian submarines as active and key components of Canada's defence structure is firmly rooted in the 1987 White Paper, *Challenge and Commitment*. The White Paper advised acquiring 10-12 nuclear-powered submarines (SSNs) for "den[ying] an opponent the use of sea areas."[4] Sea denial strategies meant that, in times of war, the mere presence of Canadian submarines in a contested waterway would be a significant deterrent to enemies. Though no SSNs were acquired, these plans exhibited 'classical' forces, directing the employment of submarines to exert strategic pressure on foreign powers. As former submariner Commander Michael Craven notes, submarines have "projecting capacities," especially in positioning "offensive power with strategic effect in the littorals and choke points of other nations." Craven also suggests that, in times of peace, operating submarines "admits Canada to that exclusive group of states participating in regulated and highly classified submarine water space management and intelligence-sharing schemes."[5] If one is willing to accept the suggestion that area denial, projecting offensive power and water space management are in Canada's strategic interests, Canadian SSKs may perform admirably in the role of the classic and traditional submarine.

Canada's submarines have perhaps most popularly been identified as constabulary units. This role seems to be the most preferred by the government and is discussed *ad nauseum* in submarine-related press releases. With stealth, far-reaching sensors and long patrol endurance, submarines make excellent maritime policing platforms. Indeed, SSKs have promise in monitoring Canadian internal waters – DND claims a *Victoria*-class submarine can patrol an area of approximately 320,000 km^2 during a 40-50 day patrol.[6]

> *With the exception of* Operation Nanook *in 2007, where HMCS* Corner Brook *participated in an Arctic sovereignty exercise, Canadian submarines have been excluded from northern power projection.*

According to this theory, SSKs can serve as hidden cameras within Canadian waters, employed by the Department of Fisheries and Oceans (DFO) and the RCMP to gather evidence to prosecute polluters, smugglers and those who violate fishery codes. These domestic operations were exemplified by HMCS *Ojibwa*'s participation, with DFO officials embarked, in *Operation Ambuscade* against illegal scalloping in 1993.[7] *Ojibwa* conducted covert surveillance near Georges Bank and relayed evidence to aid prosecutors. The ability to obtain hard evidence – especially photographic, through use of periscope cameras – is a powerful legal tool for maintaining control over waterways. Since the game of ocean control now seems oriented towards total maritime domain awareness, constabulary submarines could contribute greatly to Canadian maritime security.

A third theory suggests operating SSKs for the purpose of providing training exercise for the anti-submarine warfare (ASW) components of allied navies. Canadian journalist Peter C. Newman posits that the "real reason we have submarines is for target practice by the Americans."[8] This thought cannot be easily dismissed – DND lists participating in a "military exercise with our allies" as an example of an international role of Canadian submarines.[9] Over 50 states operate submarines, most of which are diesel-powered like Canada's, and which, under the right circumstances, are more difficult to detect than their nuclear counterparts. Foreign SSKs have been a source of frustration for Western navies. The presence of Chinese submarines near US naval exercises in November 2007 is testament to the pressure upon allies to sharpen ASW capabilities. Thus, allies supposedly pressure Canada to continue operating SSKs for the sake of participating in naval exercises.

It is true that Canada has deployed its SSKs to participate in international naval exercises. A recent example was HMCS *Corner Brook*'s approaching and rendering 'sunk' the British carrier *Illustrious* in the 2007 exercise Noble Mariner. This instance essentially mirrored the embarrassment inflicted on the US Navy by Chinese submarines in November 2007, and demonstrated that incorporating Canadian SSKs in exercises is a way to practice tracking foreign submarines. Yet submarines are hardly inexpensive investments. With future refits potentially costing almost $900 million each and with the submarines absorbing the largest portion of the navy's maintenance budget,[10] it would be fair to wonder what, if any, return Canada gets on its investment.

Evaluating Theories

The theory that envisions Canadian submarines fulfilling classical military roles seems plausible. Sinking ships, projecting power and sea denial have been historic and appropriate tasks for submarines. Submarines are "quintessentially focused on war fighting," and required to maintain "multi-purpose, combat capable force" and "balanced maritime forces."[11] Yet an analysis of Canadian military doctrine in conjunction with a comparison between the capabilities of the Canadian SSKs themselves and contemporary security objectives suggests that while these roles suit the submarines of other national navies, they are difficult to apply to Canada's.

Elementary examinations of Canadian naval doctrine yield mixed results for this theory. In *Leadmark*, the word 'submarine' appears 88 times. Few instances explicitly relate to discussions of the roles and necessity of Canadian submarines – most deal with the submarines of other states or ASW. However, the first discussion of the submarine fleet's place in the Canadian Navy does indeed point to a more traditional role, noting that the *Oberons* "had evolved by the mid-1970s into a significant operational capability assigned to support national and NATO commitments."[12] Yet *Leadmark* admits that there is more, stating that "submarines also quite literally have brought a new dimension to such sovereignty activities as fisheries patrols and counter-drug operations, being able to approach violators unobserved."[13] The latter provides further evidence of departure from pure defence roles and approaching the constabulary role.

In comparable documents written by other states – for example, the US Naval Doctrine Publication – the roles of submarines are less ambiguous and more congruent

*HMCS **Windsor** operating with Army Pathfinders during joint exercises off the Atlantic seaboard in March 2006.*

with traditional roles. Specifically, this publication posits that submarine-launched cruise missiles "are a *key element of power projection* and provide a flexible and powerful application of force."[14] *Leadmark* does not provide for such specific applications of submarines, or at least does not make public such provisions. It is granted that submarines do not need to be shooting missiles to project power. Where, then, does Canada need to project power and how does it do so? Perhaps the theatre most prominently demanding the projection of Canadian power has been the Arctic. The Arctic was featured as a component of the 1987 White Paper's 'three oceans' approach to Canadian sovereignty, and has been prioritized again by the Conservative Party. For example, in the 2007 Speech from the Throne, Prime Minister Harper asserted that "Canada will not be left behind when it comes to our Arctic."[15]

In the 20 years that have passed between the 1987 White Paper and the 2007 Speech from the Throne, Canadian submarines have not possessed true Arctic capabilities. SSKs must routinely approach the surface to draw air for diesel engines to recharge batteries, a serious hazard when operating beneath ice. This factor limits their areas of operation to ice-free regions. With the exception of *Operation Nanook* in 2007, where HMCS *Corner Brook* participated in an Arctic sovereignty exercise, Canadian submarines have been excluded from northern power projection.

Besides lacking AIP, actual submarine capabilities have also been reduced with the removal of missile systems as discussed earlier, and the persistent delays in the repairs to the fire-stricken HMCS *Chicoutimi*. *Chicoutimi*'s repairs have been deferred to begin in 2010, after which she is expected to rejoin the fleet in 2012.[16] If a significant need existed to project the power of the Canadian Forces through the operation of submarines, it seems strange that repairs would be postponed to such an extent. From these indications, it is unlikely that Canadian submarines are utilized exclusively for traditional defence roles. Definitions and practices remain ambiguous, and coupled with the Canadian submarine fleet's relative incompatibility with Canadian maritime security objectives and a reduction in operational status and capabilities we must consider other reasons to justify Canada's operation of submarines.

If a significant need existed to project the power of the Canadian Forces through the operation of submarines, it seems strange that repairs would be postponed to such an extent.

The constabulary role has a more promising supply of evidence. The case of *Operation Ambuscade* and a published commitment by DND to use submarines for intercepting

criminals within Canadian waters argue favourably for constabulary submarines. Yet while submarines have the endurance and sensor radius to patrol the long coasts of Canada, it is questionable whether they are Canada's best patrol assets. Newman raises the point that a CP-140 Aurora can survey twice an SSK's patrol area in a matter of hours. The CP-140's advanced camera suite performs a comparable function to periscope cameras, capturing criminal activity at sea on film. But while submarines do not have the speed of the CP-140s, they have two qualities that CP-140s do not: stealth and endurance. Criminals could hide evidence before an aircraft or ship comes within camera range, but a submarine can loiter indefinitely and undetected. Based on these factors, the constabulary role is a viable one for Canadian submarines.

The third theory – that the submarines exist to benefit allies – is perhaps the most controversial of the three roles. Investing over $900 million in operating four submarines to train foreign navies is a seemingly strange allocation of money for a navy with an already narrow budget. Yet Canadian submarines certainly participate in multinational exercises. This is a role affirmed in a report by the Senate Committee on National Security and Defence, which notes:

> Some experts have noted that [submarines] could be used sometime in the future by Canadian, US and other allied air and naval forces to *train in anti-submarine warfare prior to the deployment by the coalition task force to a world trouble spot*. Indeed, some of the witnesses referred to messages of *support from the US military for Canada's acquisition of submarines given the possibility of their availability for training exercises* with US naval forces.[17]

The last sentence is particularly interesting. Is it possible that external pressures have been deciding the direction of the Canadian submarine fleet all along? The report continues, noting the pressures upon the US Navy (USN) itself to invest in ASW training:

> The US Navy ... recognizes that diesel-electric submarines can pose a serious threat to its surface fleet, especially in littoral operations. Training exercises with foreign diesel-electric vessels are therefore considered of great value in honing the skills of the crews of patrol aircraft and surface ships.[18]

The USN has invested substantially in ASW training with other countries. In 2005, the USN paid to lease Swedish SSK HMS *Gotland* for two years. *Gotland*, with Swedish crew included, was stationed in San Diego and participated as an 'opposing force target' in USN ASW exercises.[19] Prior to this lease, a strong demand existed within USN circles to establish an SSK 'aggressor squadron' for long-term ASW training. Advocates called for the purchase of an SSK of foreign design but the United States has a shortage of expertise in operating or maintaining SSKs, having decommissioned its last SSK, *Blueback*, in 1990. The *Gotland* experiment was a relatively inexpensive way to fulfill these needs. Thus, it seems feasible that the United States would pressure an even closer ally, Canada, to maintain an SSK fleet for exercises.

Unlike Sweden, Canada is not known to receive any monetary compensation for lending its SSKs to naval exercises. Possible returns lie within more abstract concepts of Canadian defence policy: collective security. The defence of Canada relies on participation in multinational alliances, to which Canada contributes some of its own forces. These alliances, like NATO and NORAD, have often yielded disproportionate contributions by states in absolute terms, with the United States typically the '800-pound gorilla' in the structuring of collective security agreements. In order to maintain a place in collective security agreements, Canada has contributed resources beyond hard military assets. Historic examples include access to land and airspace granted to the United States as part of Canada's membership in NORAD, and the training of allied pilots over Canada through the Commonwealth Air Training Plan.

When Canada declined to participate in the 2003 invasion of Iraq, responses from US officials were not encouraging and there were fears that Canada would face repercussions. Failing to contribute or withdrawing from defence agreements leaves Canadian defence in an awkward situation. Yet, as with Iraq, Canada cannot always afford to contribute thousands of troops to support allies in operations around the world, if the issue could be politically damaging, or if it simply does not have the resources. It follows that the Canadian government would seek other ways to uphold security agreements, and contributing Canadian SSKs for other states to learn how to detect foreign and possibly hostile SSKs can buy Canada a secure place in its most important military alliances.

Conclusions

From this analysis, it seems a combination of constabulary roles and support for our allies is the best argument for why Canada needs submarines. That the analysis supports these roles should not be seen as surprising or disappointing. The submarines in these roles do in fact support and maintain the defence of Canada by upholding maritime

DND and the federal government have not done an effective job of convincing Canadians why we need submarines.

sovereignty and collective security agreements. Yet this analysis identifies a pressing issue: the ambiguity between the government and military about the role of submarines. While both bodies present their own views on submarines, neither view is especially cogent or consistent. The fact that this debate about the role of Canadian submarines exists is perhaps a symptom of a larger disconnect between government and military direction that, despite numerous policy statements, remains uncorrected. Without concerted efforts by the government and military to justify submarines to Canadian taxpayers, they cannot be expected to support submarine programs.

While the submarines must be stealthy, their tasking need not be. Announcing the locations and objectives of submarines would betray their benefits, but rectifying a lack of publicized empirical evidence about the utility of Canada's submarines would be a wise initiative in clearing the haze surrounding them. In sum, a comprehensive consensus about submarines must be reached between the government and the military, and a public relations plan must be prepared to circulate this consensus for public consumption.

Although Canadian submarines do not fit the popular stereotype of 'unconventional and menacing,' they contribute to Canadian maritime and collective security admirably in constabulary positions and in training our allies through multinational exercises. That the ambiguity in their roles exists, however, identifies failure on the part of DND and the federal government to report accurately and consistently on their tasks and successes. This leaves the Canadian public confused and apprehensive in supporting submarine repairs and upgrades. A public relations overhaul can perhaps save the submarines and see them supported to serve in the areas where they are needed, like the Arctic. While submarines can evade detection at sea, they need not dive and escape a proper place in the security of Canada.

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18. *Ibid*.
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J. Matthew Gillis is a fourth-year political science student at the Universitiy of King's College in Halifax, and is preparing an honours project on the core causes of contemporary maritime piracy.

Obsolescence Challenges, Part 3

Identifying Future Capability Requirements

Brent Hobson

Photo: DND

*Canada First: Arctic waters must be patrolled. Here, HMCS **Toronto** and the Canadian Coast Guard Ship **Pierre Radisson** sail through the Hudson Strait in 2008.*

In the previous two issues of *Canadian Naval Review*, I provided articles that examined the obsolescence challenges faced by the Canadian Navy, and the concept of Technology Insertion as one way of addressing these challenges. This article will review the process being used by the Canadian Forces (CF) to identify the capabilities it will require in the 2010-2030 time-frame. It will also identify the key factors, trends and requirements that have been identified as critical to the forecasting process. This will set the stage for a final article that will look at the forecast capabilities and the technologies that will be required by the navy to meet its future challenges.

In June 2006, as part of the transformation of the CF, the Chief of the Defence Staff (CDS) created the position of Chief of Force Development.[1] The intention was to adopt an integrated force development process to determine the capabilities the CF should field to meet the demands of future operations. This process is known as capability-based planning (CBP). The change to CBP was designed to allow the CF to move away from what, in the past, had often been a reactive force development process that not only proved to be unsatisfactory but had generally resulted in expensive solutions.[2]

Capability-Based Planning (CBP)

The CBP process utilizes the information contained in the following series of documents as the principal inputs into the process:

- Defence Policy Statements. Defence policy statements, such as the Canada First Defence Strategy, outline how the Canadian government plans to meet current and future defence and security challenges.
- The Future Security Environment Report (FSE). This document, written by the Chief of Force Development in 2007, describes the world in which the CF might have to operate over the next 20 years. It identifies current and emerging security trends, as well as real and potential threats.
- The Force Planning Scenario (FPS) set. These scenarios depict a range of domestic, continental and international situations in which the CF anticipate conducting operations across the full spectrum of conflict.[3]

The CBP process takes current government policy together with the FSE projections and uses this information in


Photo: Peter Haydon

Already over-crowded cities, such as Los Angeles (above), will continue to expand.

the analysis of each scenario to determine the capabilities that will be required in the future. During this step, the objective is to identify *what* capabilities are required, rather than *how* the capabilities should be provided. In general, by focusing on capabilities, the CF planners avoid the tendency simply to upgrade existing systems and/or to replace platforms with newer versions.

The next step is to identify how well the CF is able to meet that capability goal and what deficiencies exist. For each of these deficiencies, the CBP staff develops a prioritized list of alternative solutions with the assistance of an Integrated Capability Analysis Team (ICAT) comprised of subject-matter experts from the command and operational communities. The final step is the writing of a 'strategic capability roadmap' (SCR) that details the preferred set of capability alternatives to address the identified capability shortfalls.

Having outlined the basic CBP process, the next sections will examine each of the principal documents to identify what information they have provided to the current analysis.

Canada First Defence Strategy

In May 2008, the Canadian government released the Canada First Defence Strategy (CFDS). The objective of the strategy is to produce "a first-class, modern military that is well trained, well equipped and ready to take on the challenges of the 21st century."[4]

To accomplish this objective, the CFDS outlines three defence tasks:

- protecting Canada and Canadians at home;
- defending North America in cooperation with the United States; and
- contributing to international security.

The document goes on to identify six core missions for the CF:

- conduct daily domestic and continental operations, including in the Arctic and through NORAD;
- support a major international event in Canada, such as the 2010 Olympics;
- respond to a major terrorist attack;
- support civilian authorities in Canada during a crisis, such as a natural disaster;
- lead and/or conduct a major international operation for an extended period; and
- deploy forces in response to crises elsewhere in the world for shorter periods.

Through these tasks and missions, the government established its objectives in broad terms regarding national and continental security, sovereignty and international leadership. The next piece of the puzzle comes from the global and national security trends identified in the Future Security Environment Report.

Future Security Environment Report

Through the identification of current and future trends, the FSE Report lays the groundwork for understanding the future up to the year 2030.[5] This is important for two reasons. First, the CF must be aware of upcoming trends in order to maintain a force structure that is interoperable in a joint and integrated environment, both now and in the future. Second, a balance must be struck between the investments needed to maintain current activities with the investment necessary to meet emerging threats and challenges.

To provide the information necessary for CBP, the FSE Report outlines the trends in the following areas: politi-

The face of the navy has already changed and will change even more. Here, Canadian Forces Naval Weapons Technicians Leading Seaman Danielle Bray (left) and Master Seaman Marc Julien feed linked 20 mm ammunition into the Close-in Weapon System aboard the HMCS ***Ville de Quebec****.*

cal, social and economic, resource and environmental, science and technology, and military.[6]

The first area is political trends. The FSE Report identifies the continuation of globalization with increasing state and economic interdependence. It is expected that a number of new democracies will appear. However, there will also be political and economic discontent leading to increased instability and conflict. While it is expected that globalization will shift power from the United States into a more multi-polar world, the United States will continue to be the pre-eminent superpower.

With increased global instability, there will be a greater likelihood of failing states and associated humanitarian crises. This is a concern for Canada as it could lead to additional commitments for the CF abroad. As well, it is expected that international terrorism will continue to evolve with new adversaries, methods and weapons. This could also result in the CF being deployed to help stabilize and reconstruct other regions. At the same time, the FSE Report notes that there will continue to be significant criminal activity to deal with in Canada.

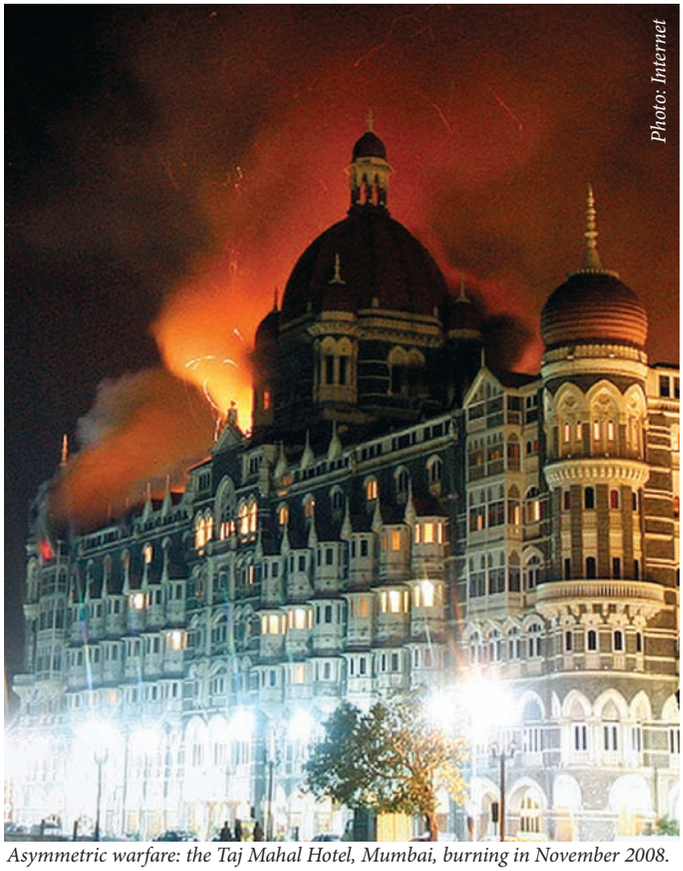
In terms of social and economic trends, public dissension always has the potential to lead to a crisis, particularly in the developing states. Continued migration is identified as a double-edged sword for both the donor and recipient states. One state may suffer as it loses its skilled labour, but the gaining state prospers. However, there will be increased pressure on the recipient state's ability to support the migrants if the numbers are too large.

In Canada, forecasts are that immigrant communities will continue to grow and begin to influence social spending and foreign policies. The increased numbers of citizens with family ties to other countries can lead the Canadian government to adopt more engaged foreign policies. This has the potential to involve the CF in additional foreign interventions in non-traditional areas. As well, immigration is seen as essential to refill the pool of CF recruits needed to offset the impacts of baby boomer retirements.

The FSE Report also highlights a growing problem with urbanization. By 2030, it is projected that 60% of the world's population will live in urban centres (many of which are within easy distance of the ocean). This will lead to the development of large mega-cities, particularly in the developing world. This will greatly strain municipal and state institutions and city dwellers in failed and fragile states will suffer from a lack of economic opportunity, inadequate infrastructure, exposure to disease and criminal activity.

Migration due to natural disaster or war will also result in the mass movement of people into these stressed urban centres. This will leave the displaced populations vulnerable to an array of hazards and their arrival can be politically and socially destabilizing. Furthermore, often living in dense and unsanitary conditions, refugees and internally displaced groups are susceptible to, and can rapidly spread, infectious disease. With increasing international trade and travel, the FSE Report notes the potential for a pandemic, and the need for global concern about this possibility.

The report also examines resource and environmental trends. The current resource inequality among states and



Asymmetric warfare: the Taj Mahal Hotel, Mumbai, burning in November 2008.

regions will only get worse with increasing conflict over resources such as food, water, oil, metals and minerals. Chief among these conflict areas will be water as drought and desertification are expected to deplete already inadequate water supplies in developing regions of the world. While oil will continue to be a strategic commodity, the report notes that demand will decrease as viable energy alternatives are developed. As well, given the rapid development of electronics, strategic metals and minerals will become an increasingly important area of competition. With regard to climate change, the FSE Report notes that this will continue to affect agricultural production, and will lead to increased migration which will in turn lead to further humanitarian crises, and exacerbate the spread of disease.

The report denotes the Arctic as an area of growing concern for Canada. A projected increase in international traffic in Arctic waters brings potential new threats to Canadian security, sovereignty and the environment.

In the area of science and technology, the FSE Report recognizes that nanotechnology use in defence applications will significantly reduce the size of sensing, networking and mobile threat detection systems. This will lead to an increase in the use of robotics, autonomous vehicles and smart weapons. Biotechnology is another area to watch as new applications will result in the creation of bio-enhanced warriors and the development of new bio-weapons.

*High-tech self-protection is still required; here, Lieutenant Dan Thompson at the Sea Sparrow control panel in HMCS **Ville de Quebec**.*

The final area the report examines is military trends. Since the end of the Cold War, the security environment has become significantly more complex. To meet the challenges posed by non-state actors, and asymmetric threats, the FSE Report suggests that the CF needs to increase its capabilities in the areas of special operations, precision technology and non-lethal weapons. The current concept of the 'four-block war' will continue to be a major driving force. Other areas of future warfare include cyber attacks, the weaponization of space, and the proliferation of chemical, biological and nuclear weapons into the hands of non-state actors.

Force Planning Scenarios

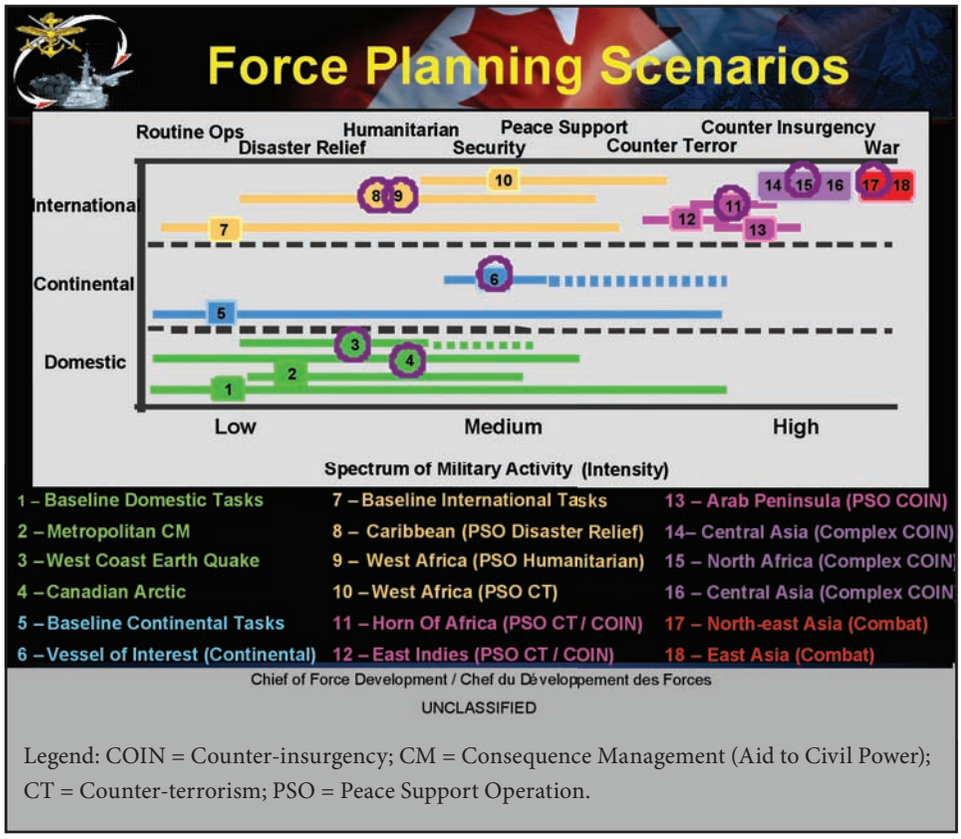
After reviewing the government's objectives in the CFDS, and noting the future trends outlined in the FSE Report, the next reference documents used by the CBP staff are the Force Planning Scenarios (FPSs).[7] The FPSs are meant to be indicative of a wide range of potential future missions that include domestic, continental and international requirements for the CF. These include a full range of operations across the full spectrum of conflict. They are intended to inspire the development of concepts, and to provide a basis for the development of future military capabilities. The scenarios can be changed as world events unfold. The scenarios that make up the current set are shown in Figure 1.

*Asymmetric threats call for additional security aboard ship; here Warrant Officer Gerry Arsenault is on security watch on HMCS **Charlottetown** prior to departing Abu Dhabi, United Arab Emirates, in 2008.*

Conclusions

The introduction of capability-based planning by the CF has resulted in a completely new method of planning for its future. The purpose of this article was to introduce the reader to that process, and to identify the main factors and considerations that have been used by the CF in the 2008 analysis. The CBP process focuses on the capabilities

Figure 1. Force Planning Scenarios



Legend: COIN = Counter-insurgency; CM = Consequence Management (Aid to Civil Power); CT = Counter-terrorism; PSO = Peace Support Operation.

required to meet future challenges and it looks at a variety of alternatives to provide that capability. The major impact of this new process is that the days of 'get a new one to replace the old one' have ended. In essence, the use of CBP means that force development for the CF is now top-down driven, and it follows a logical, integrated process that identifies the kinds of capabilities the CF will need now and in the years to come.

The three documents I have reviewed were used by the CBP process as the main ingredients for the current analysis. The Canada First Defence Strategy identifies the roles the government expects the CF to fulfil. The Future Security Environment Report outlines the future trends that must be considered. The Force Planning Scenarios confirm that the future will involve a continuum of conflict requiring a full range of defence, security, diplomatic and development activities to be conducted simultaneously.

So what does this mean for the future capability requirements for the CF? Considering the extremely wide range of tasks, trends and scenarios, the future for the CF appears to include military operations in both physical and cyber realms, at home and abroad, in complex or extreme terrain with both conventional and asymmetric weapons. The CF must be prepared to meet ever-evolving asymmetric threats, problems with non-state actors, rogue states, and deal with the results of a series of destabilizing social, economic, environmental and resource factors that could trigger conflict or result in humanitarian crisis.

The information contained in these documents was used by the staff of the Chief of Force Development through the CBP analysis to produce the Strategic Capability Roadmap. This document details the capabilities that the CF will need to meet current and future challenges, and the preferred set of capability alternatives and options to address any and all identified capability gaps.

The details of the current roadmap will be the focus of my next article with specific reference to the capabilities that have been identified for the future of the navy, and the technologies that should now be considered to meet those future challenges.

Notes

1. Department of National Defence (DND), Defence Research and Development Canada (DRDC), "New Challenges, New Opportunities," Annual Report for the Year Ending 31 March 2007, available at http://www.drdc-rddc.gc.ca/publications/annual/development_e.asp.
2. DND, Chief of Force Development, "Force Development and Capability Based Planning Handbook," 2900-1 (DGFDA), Vol. 4.2 (July 2007), p. 1.
3. For a discussion of how these documents are used, see "Force Development and Capability Based Planning Handbook," p. 3.
4. Government of Canada, "Canada First Defence Strategy," available at http://www.forces.gc.ca/site/focus/first/June18_0910_CFDS_english_low-res.pdf.
5. DND, Chief of Force Development, "The Future Security Environment 2007-2030, Part One," Draft, 8 November 2007, p. 1.
6. For discussion of trends in these areas, see *ibid*., pp. 51-52.
7. DND, "Force Development and Capability Based Planning Handbook," p. 4.

After 35 years in the Canadian Navy, Lieutenant-Commander Hobson now works part-time as a Naval Reservist at Defence Research and Development Canada – Atlantic.

Canada's Marine Security

Laureen Kinney

National security is security of a state as a whole from all threats arising from land, sea or air. *Marine* security is a subset of national security, and is the ability to address threats arising from the marine environment. Marine security in Canada is a complex, multi-faceted activity that has taken on a renewed sense of purpose in recent years to address new threats in an evolving security environment. In the years since 11 September 2001, Canada has established an extensive framework and processes to enhance the security of its marine transportation system and has led marine security initiatives at home and abroad.

Canada is a state with major maritime interests by force of geography and economics. We have 200,000 kilometres of coastline on three oceans and along the Great Lakes and St. Lawrence Seaway (GL-SLS). A significant proportion of our trade comes via the oceans (about $100 billion annually). As well, our ports are responsible directly or indirectly for more than 250,000 jobs in Canada.

Canada is inextricably linked to a complex international maritime system which is a key element of contemporary commerce. In this international environment, Canadian marine security is important not only to the Canadian economy but also to the confidence of our trading partners. Much of the material entering Canadian ports is destined for the United States, which makes security of our ports of concern to both Canadians and Americans. The overall integrity of the international system is important to Canada's national marine security posture.

The Threat Environment

Three types of threat scenarios predominate in assessing the marine environment – and these are different from the classic state-on-state threats that shaped security activity in the past. First, the system (e.g., people, vessels, port facilities) is a potential terrorist target in its own right. Second, the system can serve as a conduit for an attack (e.g., delivery of perpetrators, or a weapon of mass destruction to a target either in Canada or against our allies such as the United States). Or, third, elements of the system could serve as a weapon targeted against people or facilities (e.g., a vessel could be used to attack targets).

In recent years, there have been relatively few terrorist attacks against marine targets, although the threat of piracy has grown significantly in certain regions. However, the absence of terrorist attacks does not necessarily reflect a lack of intent on the part of terrorists. Rather, it may reflect the difficulty of the operating environment – i.e., the maritime environment requires specific operational expertise (e.g., vessel handling skills, navigation skills, appropriate equipment). In this unique operational environment, marine targets are more difficult to exploit due to safety and security practices adopted as ways of doing business in the face of longstanding piracy and pilferage threats. A renewed emphasis on security in recent years makes this even more true.

Sunset, Ellesmere Island; like much of the Canadian coastline, very beautiful but completely inhospitable.

Nonetheless, there have been terrorist attacks against marine targets. The most significant loss of life due to a terrorist attack came in 2004 when more than 100 people died as a result of a terrorist bomb on the Super Ferry 14 passenger ferry in the Philippines. Other attacks include the small vessel attack on the oil tanker *Limburgh* in 2002, and the attack on the USS *Cole* in October 2000 when 17 American sailors were killed by suicide attackers using a small boat.

Responses to Terrorist Threats

The international maritime community responded vigorously to the terrorist events of 11 September 2001. The International Maritime Organization (IMO), an agency of the United Nations that sets global safety and security standards for the maritime sector, developed the International Ship and Port Facility Security (ISPS) Code in 2002. The code was adopted under the provisions of the international Safety of Life at Sea Convention (SOLAS). Canada is a signatory to SOLAS and was a leading participant in the initiative that saw the ISPS Code adopted under SOLAS.

The ISPS Code entered into force in July 2004, supported by domestic enforcement regimes in each signatory country including Canada. The Code requires that vessels engaged on international voyages and the port facilities that serve them adhere to a set of security standards designed to ensure that vessels, mariners and port-side facilities maintain appropriate levels of security at all times. Canada has complied fully with the Code since its inception.

Marine security has been a consistent feature of the Canadian transportation sector as far back as the 1994 passage of the *Marine Transportation Security Act* (*MTSA*). Transport Canada (TC) was subsequently designated as the lead for coordinating marine security policy in Canada, working in collaboration with other federal government departments and agencies with marine security responsibilities. TC is responsible for the planning and development of policies, procedures, legislation, regulations, standards and related agreements with stakeholders, as well as the oversight and enforcement of the legal framework pertaining to the security of the Canadian transportation system.

Photo: DND

The fishing vessel ***Donegal*** *entering St. John's in June 2005 after arrest and seizure at sea by a joint navy, RCMP and Newfoundland Constabulary operation.*

While Transport Canada has the overall lead for policy coordination, other departments have roles in marine security as well. These departments include:

- Department of National Defence (DND) (particularly the navy): the lead department for overall coordination of on-water response to a threat or crisis in Canada's Exclusive Economic Zone and along our coast; monitors and controls military activities within Canada's territory, airspace and marine areas; assists other government departments in fisheries protection, drug interdiction and environmental protection; contributes to humanitarian assistance and disaster relief; maintains a national search-and-rescue capability; and responds to terrorist incidents.
- Royal Canadian Mounted Police (RCMP): overall responsibility for national security; lead investigator in national security matters; prevents and investigates crime, maintains order, enforces laws on diverse matters; and provides operational support services to other police and law enforcement agencies.
- Canada Border Services Agency (CBSA): manages borders by administering and enforcing domestic laws that govern trade and travel, as well as international agreements and conventions; identifies and interdicts high-risk individuals and goods; works with law enforcement agencies to maintain border integrity; and engages in enforcement activities, including seizures of goods, arrests, detentions, investigations, hearings and removals.
- Canadian Coast Guard (CCG): provides mariners with services related to aids to navigation, marine communications and traffic services, marine search and rescue, pollution response, icebreaking and waterways management; provides expertise, services and platforms to the Department of Fisheries and Oceans and other federal government departments and agencies requiring on-water support to fulfill their maritime mandates.
- Canadian Security Intelligence Service (CSIS): has primary responsibility for investigation, collection, analysis, production and dissemination of security intelligence and for advising the federal government on threats to security.
- Department of Public Safety Canada: brings together CSIS, the RCMP and the CBSA; the Minister of Public Safety has lead responsibility for enforcement and policing.

In addition to federal government departments and agencies, Canada Port Authorities which own and operate Canada's major ports are responsible for ensuring the security of their facilities under regulatory requirements. Finally, private sector owners and operators also have security responsibilities as a result of law and regulations.

With so many actors having interests and responsibility in marine security, coordination is a key function. Within weeks of 11 September 2001, the Interdepartmental Marine Security Working Group (IMSWG) was established under the leadership of Transport Canada. The working group was created to coordinate federal marine security efforts by identifying requirements and coordinating initiatives across the federal government. It includes 17 federal departments and agencies with various roles and responsibilities. It allows the government to have a common overview and understanding of marine security threats, issues and initiatives, and to develop coordinated initiatives.

The IMSWG has developed the fundamental concepts under which Canada's marine security framework has developed.[1] This work was produced by the IMSWG in January 2004. The four key pillars on which marine

The Fairview Terminal, Halifax: a typical busy international container port.

security policies and programs were built since 2001 are:

- Domain Awareness: surveillance and awareness of ships, people and cargo within marine areas;
- Responsiveness: cooperation with all relevant police forces and security agencies to disrupt, intercept and apprehend would-be terrorists and/or their devices;
- Safeguarding: enhancement of the physical security of marine infrastructure and other critical infrastructure in or around marine areas and enhancement of personnel security within marine areas; and
- Collaboration: harmonization with stakeholders of security frameworks, information sharing and coordinated approaches to marine security.

The working group adopted a layered approach which provides that the activities in support of the key marine security pillars will be approached across four geographic zones. The first zone is coastal/landside areas, including the Great Lakes, the St. Lawrence Seaway and marine infrastructure within Canada's territorial sea and their landside infrastructure. The second zone is Canadian waters which includes marine areas and infrastructure within Canada's Exclusive Economic Zone (200 nm offshore). The third zone is international waters which are marine areas outside of the control of sovereign states. The final zone is foreign waters which includes the territorial waters of other states and their marine infrastructure.

With these concepts in place, and with the *Marine Transportation Security Act* as legal authority, Canada was able to respond to the ISPS Code requirements. The Marine Transportation Security Regulations (MTSR) proclaimed under the *MTSA* came into force 1 July 2004 to meet Canada's international commitment.

The ISPS Code provided for an international system of threat levels and corresponding marine security responses that ISPS-compliant states agreed to implement by national law or other instruments. Marine security threat Levels One, Two and Three and associated responses are standard across the globe.

In addition to the requirements of the ISPS Code and the new security regulations, since 2001 the federal government has committed approximately $930 million – plus $74.5 million for a Great Lakes Marine Security Operations Centre in the 2008 budget – in marine security initiatives. This money was provided in support of port security, law enforcement, border security and support for the private sector. As well, funding was provided to increase air surveillance of the maritime approaches to Canada. Sea days were augmented for naval, police, coast guard and fisheries patrols. Radiation detection equipment was installed by the CBSA at major Canadian ports to ensure 100% scanning before in-bound marine containers are distributed via rail or truck. Vessel tracking and identification systems were installed on the coasts and on the GL-SLS.

Some of the other accomplishments include enhanced port security, Marine Security Operations Centres, National Port Enforcement Teams, Marine Security Enforcement Teams, Marine Security Emergency Response Teams, and the "Shiprider" Project.

Port Security

Marine ports, by their nature, are complex entities. They concentrate in relatively small geographic zones a wide range of economic, jurisdictional and security and law enforcement activities. There are more than 250 Canadian ports, which handle a wide range of passengers, cargo and other functions (e.g., fishing), and there are 19 Canada Port Authorities responsible for our largest maritime ports.

The security of marine ports is a web of shared responsibilities. But Canada has implemented a comprehensive regulatory regime for marine security that covers ports, vessels and marine facilities. Transport Canada is responsible for implementing the marine security regulatory regime covering facilities, vessels and perimeter of ports and facilities within ports. Canada Port Authorities are responsible for putting in place and maintaining security measures to meet the requirements of the regulations (e.g., access controls, perimeter security). Facility owners and operators within the ports (i.e., terminals) are also responsible within their premises for meeting the regulatory requirements.

Federal government departments and agencies operating within ports are responsible for their respective programs in the port environment. For example, the Canadian Forces have certain security responsibilities in certain ports. The CBSA provides customs and immigration functions within certain ports, and the RCMP/local police provide law enforcement services.

*The CCGS **Pierre Radisson** in Hudson Strait in 2008.*

The Marine Transportation Security Regulations require that vessels, ports and facility owners and operators develop security plans and meet a set of requirements to control access to marine facilities. For example, regulations specify security standards and practices for the people and facilities that handle passenger cruise ships, an increasingly important sector.

All Canadian vessels and facilities that require ISPS security certification operate at marine security Level One at all times. The levels rise and fall depending on the threat environment. Transport Canada manages the Canadian marine security threat system with support from the security and intelligence community. When the threat level changes due to changed security conditions, all members of the port community with security plans move to a set of pre-arranged, enhanced security activities – for example, more stringent access controls for people and goods, increased patrolling at landside perimeters or on water, etc.

Marine Security Operations Centres

In 2004, the federal government identified a need for greater coordination among federal stakeholders and mandated the creation of the Marine Security Operations Centres (MSOCs). Centres have been established on the East and West Coasts and a third is being established for the GL-SLS.

The primary purpose of the centres is to produce coordinated information and intelligence to support marine security activities for national security, law enforcement and marine response operations generally. The centres consist of government departments and agencies responsible for marine security and/or for providing asset support and maritime expertise, such as DND, RCMP, CBSA, Coast Guard, Department of Fisheries and Oceans and Transport Canada. Canada is looking to coordinate MSOC activities with the US Coast Guard Operations Centers to provide enhanced North American marine security cooperation.

National Port Enforcement Teams

The RCMP established four National Port Enforcement Teams (NPETs) – one each in Halifax, Montreal, Vancouver and Hamilton, Ontario. These are integrated, intelligence-led teams that investigate federal statute offences in the ports. The teams include Border Service personnel plus national, provincial and local law enforcement personnel who focus on national security investigations, organized crime and other criminal behaviour.

Marine Security Enforcement and Emergency Response Teams

The RCMP and Coast Guard launched a new marine security program to address potential threats in the Great Lakes-St. Lawrence region. Marine Security Enforcement Teams (MSETs) are integrated, dedicated units staffed with RCMP members and include provincial and municipal police departments, working in uniform onboard dedicated marine security patrol vessels operated by the Coast Guard. Four new patrol vessels are scheduled to be delivered to the GL-SLS region in the coming years. In the interim, four vessels (one RCMP and three Coast Guard) have been deployed to conduct joint security patrols in the region until the patrol vessels are built.

Their primary role is to safeguard and address federal on-water enforcement requirements and provide an armed fast-response capacity to address potential threats. These vessels also serve, as required, as platforms for Marine Security Emergency Response Teams (MSERTs). Two specially-trained RCMP MSERTs are located in Montreal and Toronto to provide a rapid, armed tactical marine intervention capability to respond to critical, time-sensitive situations on the Great Lakes or in the St. Lawrence Seaway. The teams include provincial and municipal officers from Ontario and Quebec. They give the RCMP an enhanced ability to board ships in Canadian waters and apprehend persons that pose a security risk to Canada. These are high-risk tactical interventions that require highly trained personnel and specialized equipment.

Shiprider Project

Canada has worked closely with the United States on marine security initiatives in recent years including a project called Shiprider. Under this initiative, RCMP and US Coast Guard officers would ride together on the same patrol vessels back and forth across the international boundary in shared waterways. There have been several Shiprider pilot projects over the last three years on the St. Lawrence Seaway, Great Lakes and Pacific coast.

Officers of both services crew each vessel together so that operations in Canada are conducted under the direct supervision of an RCMP officer and operations in the

United States are conducted under the direct supervision of a US Coast Guard officer. When operating in Canadian waters, the US personnel assist their RCMP partners in the enforcement of Canadian laws, and vice versa. This and other pilot projects on the Great Lakes and East and West Coasts have led to negotiations to establish a formal bi-national protocol for marine law enforcement.

Other Security Activities

In addition to military and law enforcement initiatives, Canada's marine security posture includes a suite of activities mandated under the MTSR that enhance port and vessel security generally. After 2004, the private sector had to make investments in facilities and operations to meet security standards. The government set up a $115 million program to help defray costs. Projects eligible for funding under the program included surveillance equipment (e.g., cameras, closed-circuit television systems), improvements to dockside and perimeter security, and access control such as fencing, gates, signage and lighting, and other improvements.

Over and above the requirements of the ISPS Code and MTSR, Transport Canada also established a security clearance program for marine workers in certain security-sensitive positions. So, for example, all workers who need access to restricted zones to service cruise ships require a security clearance. The same is true for certain workers in container terminals or those who work in security positions in ports.

Transport Canada is also developing security regulations for domestic ferries. Although not a requirement under the ISPS Code, ferries are potentially attractive targets for terrorists and the new regulations will seek to minimize vulnerabilities in this part of the mass transit system.

In addition, in partnership with the United States, Transport Canada has established enhanced security procedures for vessels entering the St. Lawrence Seaway system, and is working with international organizations (notably the IMO, the Asia-Pacific Economic Cooperation (APEC) group, the Organization of American States and the G-8) to develop new international marine security requirements and capacity-building programs.

The Canadian Coast Guard fleet provides ongoing on-water federal presence as it goes about conducting tasks for its many programs such as aids to navigation, conduct of ocean science research and waterways management. In support of its federal presence activity, the Coast Guard runs the Observe, Record, Report program where suspicious activity spotted by a ship's crew is reported to the RCMP Coast Watch program and the responsible MSOC.

The Coast Guard in conjunction with Transport Canada is in the process of implementing a new international long-range vessel identification and tracking system to allow tracking of SOLAS vessels up to 1,000 nautical miles from Canada's coasts. This system will allow the monitoring of vessels coming to Canada, sailing along the coasts or flying the Canadian flag and operating anywhere in the world.

Challenges

Much has been accomplished since 2001 to enhance Canada's marine security but challenges remain. Canada's capacity to respond effectively to on-water security events requires continuing attention. Security authorities require the capacity to provide adequate and appropriate on-water security in ports, and appropriate legal authority must be available to impose and enforce such measures as controlled access and exclusion zones.

In many cases, international trends drive Canadian initiatives. For example, the IMO is looking at voluntary security guidelines for small vessels not covered by the ISPS Code, and the United States has developed a small vessel security strategy due to concerns about security threats from small boats. These influences have led Transport Canada to consult on the need for a parallel Canadian small vessel security strategy for some of the same reasons.

As well, the United States and other countries are engaged in planning activities to ensure that maritime supply chains can be revived as quickly as possible in case of port disruptions or closures due to terrorism or natural disasters. Transport Canada has embarked on a similar exercise working closely with the CBSA and the Coast Guard (Canadian and American) and other partners in government and the private sector.

Canada's marine security involves a complex web of responsibilities, jurisdictions and activities that defies easy description. That said, over the last few years there has been a dedicated focus on ensuring that an elaborate security regime is in place to protect Canada's maritime interests. The challenge in years to come will be to maintain a supple marine security system with sufficient resources that can adjust in a nimble and effective way to an evolving threat environment which is very different from the past.

Notes

1. See Transport Canada, "Enhancing the Security of Canada's Transportation System," available at http://tcinfo/MarineSecurity/Policy/enhancing/menu.htm.

Laureen Kinney is Director General of Marine Security at Transport Canada.

Malaise or Farce: The International Failure of Maritime Security

Dave Mugridge

Photos: CNR

Does the threat (of terror or crime) lie on the ship or in the port?

How right Mao was when he declared, "[w]e hold that our strategy does not embrace purely military affairs. War must be comprehensive and combined strategy."

The world faces a complex, rapidly changing strategic environment, occasioned by the end of the Cold War, the potential demise of globalism and the rise of non-state terrorism. This has led many Western states towards revisionist national security strategies focused increasingly upon reactive land-centred operations and an over-reliance on seemingly unenforceable international law. Credible evidence suggests that in many states, including Canada, maritime security lacks financial or political resources, sustainability, relevance or multi-agency coherence. The world's oceans continue to offer both non-state terrorists and transnational criminals a relatively benign environment in which to operate. With NATO predominantly focused upon wars in both Iraq and Afghanistan, elements of these socially malignant groups ply the world's oceans with near impunity. When august organizations such as the RAND Corporation highlight the impact of crime and terrorism on maritime security, it would be prudent to review international responses and re-evaluate strategy.[1]

A more proactive, holistic response to the unconventional threats of maritime-based terrorism, piracy and transnational organized crime is required. The international community, in particular the G8, can ill afford to ignore the evidence of non-state terrorists or transnational criminals profiting from their failure to enforce either national or international law across the maritime domain. Diverse threats to maritime security can be distilled to show a common operational background. Illegal immigration from South to North America, narcotics trafficking from Colombia to USA, Al Qaeda's maritime operations off Yemen and radical terrorists entering India via water prior to attacking the commercial heart of Mumbai are either a building storm cloud or timely warning.

This article intends to highlight the developing international malaise and examine contemporary maritime security issues. It argues that whilst conventional threats to maritime security remain low, relatively constant and localized, irregular, non-conventional actors are increasingly threatening global maritime security.[2] This demands the promotion of a vigorous, coherent and international approach through the adaptation of established counter-insurgency (COIN) doctrine.

Throughout history the maritime domain has been both a source of considerable economic wealth and an area of vulnerability for the world's trading states. Canada, for example, derived $100 billion from international maritime trade or 14% of overall trade in 2005 with some 350 million tonnes of cargo moved through Canadian ports.[4] Paradoxically, many states and international bodies could nonetheless be said to suffer from acute 'sea-blindness.'

Sea-blindness can be defined as a socio-political failure to acknowledge or recognize the importance of the maritime domain to both society and economy. Canada sub-consciously exacerbates this with reference to 'the Maritimes' or 'Atlantic (and Pacific) Canada' setting apart these provinces from the continental trading provinces. This alien condition transcends society from politicians to the working man, from private industry to political bodies and marks a clear break in the contemporary unity of government, society and military. The future physical and economic security of many states depends upon the freedom to use the world's oceans and their ability to influence world-wide political events by military means, given that the maritime environment is the most likely way to transport military materiel/assistance to crisis locations or, paradoxically, weapons of mass destruction to Western shores.

Canada's now traditional response to international maritime security threats.

Maritime trade remains crucial for the survival of a vibrant and healthy international economy. Globalization has been a veritable 'Revolution in Commercial Affairs,' ranking alongside the original Industrial Revolution for its paradigm-changing economic impact. It has allowed for the demise of traditional industrial and manufacturing-based economies, the specialization of agriculture and the economic rise of service industries, but requires a secure mercantile marine network for transporting goods and raw materials to the point of demand.

The plethora of recent international legislation designed to support maritime security has proved to be unwieldy in the face of non-state terrorism, transnational crime or piracy. The marine environment operates based upon the principles included in the Safety of Life at Sea (SOLAS) Agreement (1974), United Nations Convention of the Law of the Sea (UNCLOS) (1982) and the Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation (SUA) (1988). It is now argued by some people that these agreements hamper effective coordination or multilateral efforts to counter the rising tide of maritime criminality.[5] As an example, the recently published UK National Security Strategy is effectively hamstrung by its reliance upon unenforceable international laws and conventions. This is also true for those countries which are not prepared to try those suspected of piracy in their own courts for fear of bogus asylum claims or religious/ethnically-based protests.

Recent attempts to modify the out-dated provisions of UNCLOS in order to make it a more effective counter to piracy have failed. Martin Murphy, for example, has argued that the piracy provisions in UNCLOS have lost their relevance as the world has changed. But the provisions are small elements in a larger treaty that no one wants to renegotiate because it provides a basis for cooperation. He also argues that the security of maritime trade is too important to be left to the mercy of "outdated provisions and unwilling states."[6] Despite UNSC Resolution 1816 of June 2008 condemning piracy and allowing international warships to pursue pirates into Somali waters, the failure of the international community to act in concert over piracy does little to promote confidence in the regulatory amalgam.

The introduction of the International Ship and Port Facility Security Code (ISPS) in 2004 provided the international community with a comprehensive legal framework to combat acts of terrorism or criminal activity upon the high seas. Although the ISPS Code was an International Maritime Organization-led response to the terrorist atrocities of 2001, it was widely seen as being heavily influenced by the United States. It places stringent obligations upon all persons involved in the shipping industry to guarantee

the safety of crew, cargo and society from terrorist or criminal acts. Yet this response in isolation is not likely to address the many causes of maritime criminality or the use of the high seas by non-state-based terrorist organizations. To contribute effectively to maritime security it needs rigorous enforcement focused upon those who use the maritime domain for illegal purposes and not innocent professionals employed at sea. With sagacious application it could provide a law enforcement mechanism as part of a wider international response. It is increasingly unacceptable for the parameters of ISPS to be self-regulated by individual states, or for its implementation to be seen as the price the 'developing' world has to pay in order to trade with the 'developed' world. This is one particular area where international bodies such as the IMO, UN, G8 or NATO can act in concert to improve maritime security.


Photo: DND

Is the mere escort of high-value shipping enough?

The terrorist attacks of 9/11 provided an unexpected and irreversible paradigm shift in the level of threat posed against the international community by non-state terrorists and transnational criminals. Sadly many states demonstrate ostrich-like tendencies when reviewing the relevance of the maritime domain to national security. For example a review of the UK National Security Strategy (2008) illustrated a disappointing lack of reference to maritime security or associated dependence upon maritime trade. As with any addiction, the acknowledgement of the problem marks the watershed en route to recovery, not empty sentiment or hollow words. The UK's blind and naive acceptance of unenforceable international law is not unique, ignoring as it does the complex problems of modern-day piracy, non-state terrorism and transnational criminality. Like Canada but unlike the United States, an effective national response or strategy has not been developed: instead the necessary political will, financial resources and equipment are focused upon waging two intractable land wars in Iraq and Afghanistan. This continuing failure to assess threat adequately now prejudices global security.

Modern-day maritime terrorism is marginalized as an irrelevance by the proponents of engaging a stateless enemy in distant land wars. Will such campaigns deny Al Qaeda initiative or lessen its ability to bring the fight to the 'developed' world? If the New York terrorist atrocities of 9/11 provided apposite lessons, it was that the world should expect the unexpected and Al Qaeda is a capable opponent worthy of our collective respect. Globally, terrorist groups such as Al Qaeda, GAM and Tamil Tigers have a proven ability to launch attacks within the maritime domain and there is a growing body of evidence of a sinister nexus developing among these groups who threaten maritime security.[8]

Organized crime is probably the most common of all the threats which are committed at sea. Often reported in the world's media are regular drug seizures made in the Caribbean, illegal immigration into Europe from Africa or illegal weapons imported to fuel the growing tide of gun crime. Yet how holistic or effective is the international response to this Pandora's box of criminal behaviour? Are meagre national security resources spent wisely? Do states target actual long-range criminal activity, or does the public respond with surprise and alarm when drugs are sold openly on the streets by armed drug gangs? Policing drug and gun crime on the streets is akin to trying to put an omelette back into the broken eggshell whence it came. NATO's 'comprehensive approach' to operations in Afghanistan is designed to create an environment which will no longer be conducive to mass opium production. If this argument were translated into the maritime environment, then it would see calls for increases in NATO constabulary patrols, maritime operational effectiveness and naval platform numbers.

Piracy is an emotive topic – even its definition sparks an animated debate as to what constitutes the act and how it should be countered. Piracy is explicitly defined in Article 101 of UNCLOS as "an armed robbery that occurs in a ship on the high seas, outside the jurisdiction of any State." This definition thus separates piracy from privateering and is relatively unhelpful in the current circumstances. Piracy is not a global issue, instead it is concentrated in a number of distinct areas of the world – despite the recent spate of piracy off Somalia, the International Maritime Bureau's *Piracy and Armed Robbery Report (2003-2007)* notes that 63% of 757 offences in this time period occurred in Asian waters. Piracy arises for a number of

reasons, but particularly because of failed states, corruption, poverty and opportunity. The UNCLOS definition of piracy as a private act conducted by individuals on the high seas creates a body of distorted statistics and legal impediments to its effective prosecution. As a counter, a tailor-made international response is required to provide a lasting solution which brings together public, private, civilian and military organizations. The world needs a proactive response and not further procrastination, and it needs responsible states like Canada to use their military capability to best effect.

The behaviour and methodology of those threatening maritime security is closely aligned with that of insurgents. They are localized, small in number, disparate, irregular and targeting the perceived weaknesses of conventional forces or government agencies ranged against them. Rather than a deployment of conventional forces it would be more efficacious, cost-effective in the delivery of a long-term solution for a coherent, well-resourced, multi-agency international response to be pursued. This recognizes that a military response seldom delivers a lasting conclusion to such a multi-dimensional problem. We can illustrate the value of a more imaginative multi-agency approach by drawing on the recent successes of joint operations in Iraq and bilateral work to improve littoral security in the Niger Delta.

Contemporary counter-insurgency doctrine illustrates many tactics and conflicting approaches but the fundamental essence of an approach can be distilled to apply to delivering effective maritime security. The elements of the doctrine would include the following:

- The establishment of political primacy and maintenance of the political aim to address maritime security allow the government to formulate long-term plans.
- Coordinated government machinery is essential given the requirement for an integrated response and the likelihood that each government agency will approach the problem differently.
- Intelligence and information management are crucial.
- Separating the terrorists/criminals from their support is absolutely fundamental.
- Neutralizing the terrorists/criminals must be done, whether by removing their support, capturing or killing them.
- Stabilization planning is the key to a successful campaign as it provides a significant impetus to any non-military initiative.

Current global naval activity is increasingly unlikely to succeed against such irregular threats. Time and time again tactical successes have not deterred a local population from joining or supporting an insurgency if its concerns are not addressed.[9] A coordinated international response which includes active participation from all interested parties, focused on the delivery of political and socio-economic investment will address more than just immediate security issues. We should remember the failure of 'coordinated government' to maximize the goodwill of the Iraqi people following their 'liberation' in 2003. By not delivering effective and timely investment in infrastructure projects in the immediate aftermath of the collapse of Saddam Hussein's regime, serious and long-lasting security problems ensued.

A multi-agency approach requires coordination of six lines of operations, which can be listed under the acronym 'SLEEPS' – security, legal, economics, environment, politics and sociology.[10] These lines of operation would need to be synchronized into campaign phases, with key activities coordinated to achieve a politically endorsed end-state. Figure 1 and Table 1 illustrate the SLEEPS model.

The model requires wide coordination, political capital and resources from a number of international and national bodies with private sector assistance to deliver campaign objectives. This model allows considerable opportunities for private security companies and non-government organizations to undertake training, provide basic levels of security, deliver local health care, education and infrastructure work. By altering the international approach to dealing with maritime criminality, perhaps the perception of those who practise it can also be altered.

Figure 1. The SLEEPS Model

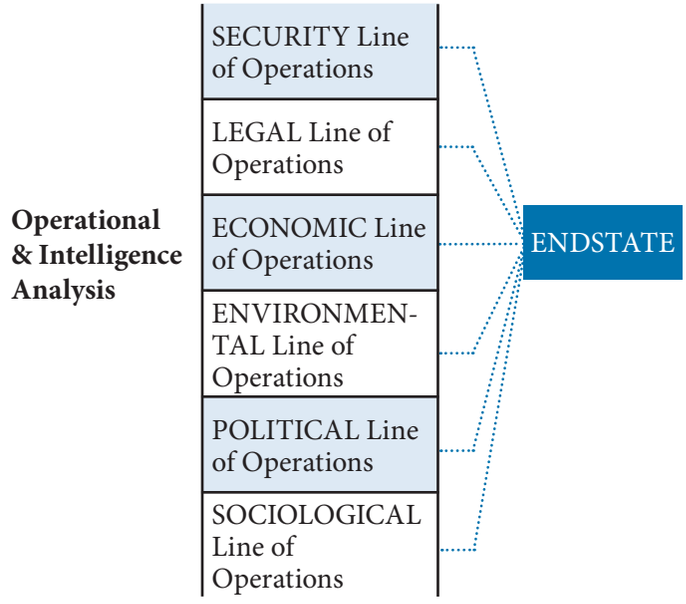


Table 1. SLEEPS Model and Relevant Government Departments

Security (Military/Naval)	Legal (Judiciary, Law Enforcement)	Economics (Development Aid or Investment)
Environment (Infrastructure)	Politics (Inter-/Intrastate Governance)	Sociological (Education, Health Care and Social Affairs)

Skeptics will suggest that the financial cost of combatting piracy, terrorism, organized crime, illegal immigration and the proliferation of WMD within the maritime domain through a comprehensive approach is prohibitive. But this misses the point. Here the fundamental tenet is that a well-coordinated and holistic approach is not inexpensive nor is it easy to achieve in the short term. Nonetheless, its long-term benefits far exceed the law of diminishing returns when compared to a financially comparable conventional military response. Given the potential risks, society's failure to address the very serious multi-faceted threats within the maritime domain would be bordering upon the ostrich-like. Do we wish to live in a world where individuals and rogue states have the ability to terrorize, trade in WMD, ply our streets with narcotics and deliver illegal aliens to the countries of their choosing? Or do we wish to address these issues with the full power and legitimacy of a comprehensive multi-agency response?

Mature democratic societies face choices over how their governments behave and how they deliver effective national security. No one course of action will deliver an immediate, universally successful and inexpensive solution. In the context of limiting nefarious maritime activity to an acceptable level, the resource-based decisions societies face are how much to expend and over what time-scale? Those skeptics who claim a comprehensive multi-agency approach to counter developing maritime threats would achieve little and cost a lot should turn their sights to the land campaigns being waged in Iraq and Afghanistan where military commanders now acknowledge that a conventionally defined victory over insurgents is impossible. It is difficult to derive accurate financial figures that meaningfully contribute to this debate. The philosophical waters are muddied by confusion over definitions, budgetary responsibility, direct and indirect expenditure to name but a few. But the time has come when we should accept that myopic unipolar campaign plans do not work ultimately.

In conclusion, as Robert Thompson, the lead political strategist of the British Malaya campaign in the 1950s, so eloquently said:

> The government must have an overall plan. This plan must cover not just the security measures and military operations. It must include all political, social, economic, administration, police and other measures which have a bearing.... Above all it must clearly define roles and responsibilities to avoid duplication of effort and to ensure that there are no gaps in the government's field of action.[11]

And for this reason the field of maritime security provides fertile ground for further academic research, particularly in threat analysis of the irregular, non-state actors involved. Further research will (hopefully) end the growing debate over international maritime susceptibility and recommend a new approach to obviate many of the current impediments to effective maritime security. Many national maritime security strategies require redirection towards international collaboration. They should instead draw inspiration from the global pool of counter-insurgency experience in delivering an effective international response. Whilst acknowledging some progress has been made, it is clear that more collaborative work is urgently required. The increase of maritime criminality and terrorism already suggests a far-sighted revisionist approach is required to deter further exploitation of the sea by today's criminal and terrorist groups. Further delay by the 'ostrich' states could well allow terrorists and criminals an opportunity to entrench a proven capability at the expense of the global economy and security.

Notes

1. Peter Chalk, *The Maritime Dimension of International Security: Terrorism, Piracy, and Challenges for the US* (Washington, DC: Rand, 2007), p. iii.
2. See B. Raman and P. Ghosh, *Securing the Oceans: An Indian Ocean Perspective* (New Delhi: National Maritime Foundation, 2005).
3. Wyn Rees, "Linking Organised Crime and Terrorism," ECPR Newsletter, Vol. 5 (2006), pp. 8-9.
4. Peter Avis, *Comparing National Security Approaches to Maritime Security in the Post 9/11 Era* (Halifax: Centre for Foreign Policy Studies, Dalhousie University, 2005).
5. See Peter Lehr (ed.), *Violence at Sea: Piracy in the Age of Global Terrorism* (New York: Routledge, 2007), p. xi.
6. See, for example, Martin N. Murphy, "Contemporary Piracy and Maritime Terrorism," *Adelphi Paper 388*, The International Institute for Strategic Studies, 2007; *Suppression of Piracy and Maritime Terrorism: A Suitable Role for the Navy?* (Naval War College Press, 2007).
7. Gwyn Prins and Robert Lord Salisbury, "Risk, Threat and Security: The Case of the United Kingdom," *RUSI Journal*, Vol. 153, No. 1 (2008), p. 7.
8. Lehr (ed.), *Violence at Sea*, p. ix.
9. Daniel Marston and Carter Malkasian, *Counter Insurgency in Modern Warfare* (Botley: Osprey, 2008).
10. David Mugridge, "What are the lessons for the UK in its Conduct of Modern Day Joint and Combined Operations from Counter-insurgency Operations Conducted by the Western Powers in Asia 1945-1989?" (ACSC: Shrivenham, 2005), pp. 28-29.
11. Sir Robert Thompson, *Defeating Communist Insurgency* (London: Chatto and Windus, 1966).

Dave Mugridge served in the Royal Navy 1988-2007. He now works for a Norwegian seismic company whilst studying towards his PhD. He is a student at Plymouth Business School and is an Associate Research Fellow at Dalhousie's Centre for Foreign Policy Studies.

"The Very Image of a Man of the Arctic": Commodore O.C.S. Robertson

Lieutenant (N) Jason M. Delaney and Michael Whitby

It is doubtful if many in the Canadian Navy, let alone Canada, have heard of Commodore Owen Connor Struan Robertson. This is regrettable. At a time when the navy and the country are looking northward, Robertson's exploits stand him apart as the pre-eminent Arctic expert in the service's history and his career can help point the way to the future.[1] Known as 'Long Robbie' due to his lofty stature – accounts vary but he was somewhere between 6'5" and 6'8" tall – he was also a giant in terms of his accomplishments.

As Commanding Officer of HMCS *Labrador* in the mid-1950s, he carved out a reputation as a skilled Arctic navigator and received international acclaim for taking her through the elusive Northwest Passage. Later, when the United States Navy operated in northern waters supporting the construction of the Distant Early Warning (DEW) Line and conducting under-ice missions in nuclear submarines (SSN), it specifically requested his participation. He was truly a northern star. With today's navy heading north again after a long time away, Robertson's example provides a lesson of the benefits of key naval personnel learning the skills required to operate effectively within an important and challenging element of the Canadian milieu – in 'white' water, if you will. Moreover, it demonstrates how that expertise is welcomed by our closest allies, creating a better appreciation of our national position through joint operations.

A seasoned merchant mariner who joined the RCN as a reservist in 1932, Owen Robertson had a distinguished Second World War record including serving in critical training billets and commanding several ships. In 1944, in an episode eerily reminiscent of the 1917 Halifax explosion, Robertson, serving as King's Harbour Master in the same port, received the George Medal for calmly taking a burning ammunition ship to safety after the crew had abandoned ship. After commanding a fleet destroyer in the early days of peace and serving in the naval mission in the UK, in 1952 he petitioned successfully for command of *Labrador*, the RCN's first icebreaker. For two years while the ship was under construction, Robertson gained experience in American icebreakers that worked in the Arctic each summer.

Captain (later Commodore) O.C.S. Robertson, RCN.

In 1952, he joined USS *Eastwind*, which was participating in sealift operations supporting the construction of the strategic air base at Thule, Greenland. *Eastwind* then headed north to re-supply the joint US-Canadian weather station at Alert on the northern tip of Ellesmere Island – just 520 miles from the North Pole. Such experience gave Robertson first-hand knowledge in coping with the various ice conditions and other navigation hazards prevalent in the Arctic.

In 1953 Robertson joined another icebreaker USS *Burton Island* as observer to the US Beaufort Sea expedition in the western Arctic. He also had a diplomatic brief as the Canadian government instructed him to prevent the icebreaker completing the Northwest Passage by

returning home eastward unless "in his opinion, [*Burton Island*'s] return to the westward would be truly hazardous."[2] Later that year Robertson served as observer to a US amphibious exercise in northern Labrador, and when the officer leading the section to which he was attached suffered an ankle injury, Robertson instinctively took charge and led the section to its objective without members realizing he was a Canadian naval officer.[3]

Photo: DND

HMCS ***Labrador*** *in the Northwest Passage.*

When he finally took command of *Labrador* in 1954, Robertson quickly began writing the primer for Canadian naval operations in the Arctic. *Labrador* had a host of responsibilities on her first deployment, and Robertson coordinated with Naval Headquarters, which directed the mission, and with scientists from a variety of international institutions, to ensure the mission would satisfy national, military and research objectives. Years later, *Labrador*'s Direction Officer, Lieutenant-Commander Peter Lloyd, Royal Navy (RN), remarked that the only person who could have pulled off *Labrador's* legendary maiden voyage was Long Robbie.[4] His exacting attention to detail, disarming charm and dogged work ethic combined with a superior wit, sense of humour and a participative leadership style were critical to *Labrador*'s success.

Two examples demonstrate Robertson's brand of leadership. To ensure that a schism did not build up between ship's personnel and civilian scientists – a problem he had observed in American icebreakers – he insisted the scientists wear naval dress and paired them in cabins with the ship's officers. This proved effective, and both communities felt part of a unified team. Robertson also instituted a system that became a source of pride among his watch officers, who after years of striving to avoid collisions had to get used to ramming and crushing solid ice. Because of *Labrador*'s unique diesel-electric propulsion configuration, all six of her powerful diesel engines were not required to be on line all the time; and not every officer was authorized to use full power. This meant that officers who had the Captain's consent to use all six-engines were extremely proud of that fact, and it gave the others a goal to work towards.[5]

Labrador is best known for her 1954 maiden voyage when she became the first deep-draught vessel to complete the Northwest Passage and circumnavigate North America, but the ship achieved other accomplishments. As Robertson recalled, "the work we did was very varied, but it was almost all directed to the same end; transport. If Canada wants to use the Arctic, getting into and out of it is the first thing to make sure about."[6] To that end, sailors and scientists sounded uncharted areas of the Arctic archipelago and conducted valuable oceanographic research. These and other accomplishments led to Robertson being recognized by the prestigious Royal Geographic Society for "exceptional work by scientific geographers and explorers."[7] However, *Labrador's* maiden voyage was only the tip of the iceberg compared to the activities of the following year.

The year 1955 saw the beginning of Project 572, the seaborne reconnaissance, site survey and construction of the DEW Line stations in the eastern Arctic. This proved an enormous undertaking and in many ways, more demanding and difficult than *Labrador*'s first year in service. For weeks prior to the arrival of the support convoy from the USN's Military Sea Transportation Service (MSTS), *Labrador* plied the ice-choked Foxe Basin where the force would land tons of material 'over the beach.' The crew worked tirelessly with the ship's hydrographic survey team and embarked underwater demolitions unit to clear beaches, survey approaches and set up navigational markers for the impending offloading of construction material, heavy equipment, fuel and supplies. Establishing standard operating procedures as she went, *Labrador* operated as an ice escort, survey and research vessel as well as a command platform from which task group activities were coordinated.

After the 1955 mission, Robertson received praise from

the USN's Chief of Naval Operations (CNO), Admiral Arleigh Burke, who extended "hearty congratulations for the most excellent performance of your task group…. The undertaking was a stupendous effort with the accepted hazards of ice, weather and unknown hydrography. The successful attainment of all objectives is a tribute to your leadership, professional ability and courage." The Commander of MSTS, Vice-Admiral F.C. Denebrink, USN, also praised Robertson by stating that "[y]our leadership, courage, professional skill and determination have been of the highest order throughout trying operations in uncharted waters and hazardous ice conditions and reflect the greatest credit upon you and upon your service. It has been a pleasure to have you serve with us in our mutual endeavours."[8]

However, the enormous responsibility exacted a physical toll. For over a month, Robertson had coordinated activities in Foxe Basin in addition to his primary responsibility as Commanding Officer (CO) of an unconventional ship navigating uncharted waters. He managed the safe transport and delivery of thousands of tons of cargo destined to build the most technically advanced and elaborate radar systems of the time – all without flagship facilities or an embarked mission staff. At the end of the mission, and with his ship still up north, Robertson was evacuated by air to Montreal for emergency surgery on a perforated ulcer, the direct result of the enormous burden he had shouldered.

Although Robertson never returned to *Labrador*, his involvement in Arctic matters endured. After he recovered from his illness, the USN specifically requested his services as the Deputy Commander of MSTS Atlantic where he helped plan the movements of the 126 ships that delivered cargo to DEW Line sites in the eastern Arctic. Much of his time was spent at their headquarters in New York, but during the summer he returned to the north to oversee operations.

Despite working outside the normal career mainstream for five years, the RCN recognized the importance of Robertson's achievements. In January 1957 he was promoted Commodore and appointed senior Canadian naval officer in Washington. The mutual respect he had developed with the USN was undoubtedly a critical element of this assignment. From this position of prestige and influence Robertson further developed the relationships he had fostered within the US naval and research establishment. In 1958, for example, he was invited aboard the USN airship ZTG2 when it conducted trials in the Arctic.

Yet it was his close relationship with Dr. Waldo Lyon that paid the most dividends. Working out of the Navy Electronic Lab in San Diego, Lyon was the foremost proponent of under-ice submarine operations, and had carried out research in the Arctic since the late 1940s, much of it in close cooperation with Canada. He developed a good working relationship with Robertson and when the Canadian was in *Labrador*, Lyon had asked him to take soundings along routes SSNs might use in the future. After a tough battle to convince the USN brass that submarines could safely operate under ice, Lyon's ideas gained endorsement with the historic Arctic voyages of *Nautilus* and *Skate* in the late 1950s, and he began planning the under-ice transit of the Northwest Passage by a nuclear submarine. He wanted to include Robertson to take advantage of his first-hand knowledge of the waters between Barrow Strait and Viscount Melville Sound – a particularly tough part of the Northwest Passage that Robertson had mastered in *Labrador*.[9] Robertson was only too eager to contribute; moreover, since Canada was then investigating acquiring its own nuclear submarines, he would have a unique opportunity to witness their capability from close quarters.

Photo: US Navy

*USS **Seadragon** returning from transiting the Northwest Passage in 1960.*

Robertson's first opportunity to go to sea in a nuclear boat came in January 1960 when the CNO arranged for him to ride in USS *Sargo* when she was in the midst of an extended cruise under the western Arctic. On 28 January 1960 *Sargo*'s CO, Lieutenant-Commander John Nicholson, surfaced his boat in a *polynya* to embark Robertson from the icebreaker USS *Staten Island*. The Canadian was only supposed to visit for a few hours but Nicholson invited him to stay overnight. Nicholson recalled that the enterprising Canadian, "eagerly accepted…. He just happened to have a small suitcase with him."[10] The next day Robertson walked back to *Staten Island* over the pack

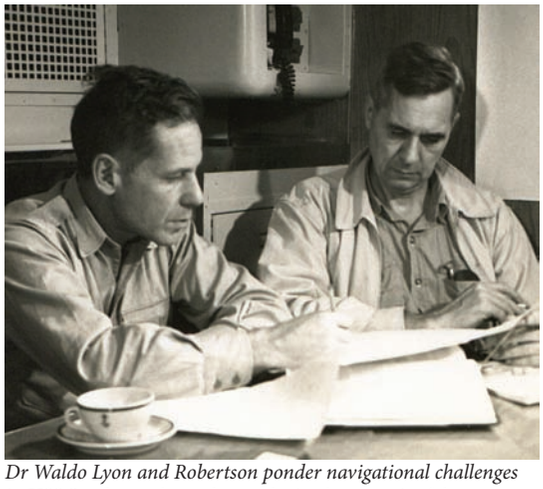


Photo courtesy Capt. Glenn Brewer, USN (Retd)

*Dr Waldo Lyon and Robertson ponder navigational challenges in USS **Seadragon**'s wardroom during her transit of the Northwest Passage.*

ice. He had now 'transited' portions of the Arctic by ship, launch, patrol aircraft, helicopter, airship, nuclear submarine and foot. From that brief encounter Nicholson and Robertson became close friends, yet another example of how easily and naturally Robertson earned the trust of Canada's American allies.

Although Robertson left a positive impression in *Sargo*, his contribution to an historic mission conducted by another nuclear submarine later the same year was far more substantial. Proceeding from her base at Portsmouth, New Hampshire, to her new duty station of Pearl Harbor via the Arctic, USS *Seadragon* (SSN 584) became the first submarine to complete the Northwest Passage submerged; something many thought impossible. She also became the first submarine to operate close under and around icebergs – not as easy as it seems – and surfaced at the geographic North Pole. Throughout the mission *Seadragon* also took hundreds of soundings that would enable other SSNs to conduct similar operations. Robertson was embarked throughout the arduous passage, having joined the boat at Portsmouth discreetly in civilian clothes so that his RCN uniform would not betray *Seadragon*'s destination in the Canadian archipelago.

Seadragon's CO, Commander George Steele, recalls that Robertson was not only invited on the trip because of his Arctic expertise but to 'finesse' the delicate issue of a USN platform transiting waters that Canada considered its own, a position Americans do not share. Diplomacy aside, Robertson's experience and personality proved important attributes to the *Seadragon* team, and Steele remembers him with considerable respect. "We asked him endless questions about navigation (the charts were poor), character of the ice (which varied as we went along), and the history of the region and its exploration." Steele was initially concerned that "as a senior officer accustomed to command, and an experienced Arctic hand, he must often have had strong opinions about the conduct of the operation, but the Commodore never once attempted to press his advice upon any of us." Robertson had the run of the boat forward of the reactor compartment, which was off-limits to non-Americans, and Steele recalls, "[h]e was often in the control room watching everything we did and I welcomed him. At meals we would get him to tell sea stories about his adventures and the RCN. I have never had a better shipmate."[11] Junior officers expressed similar sentiments, and Lieutenant Glenn Brewer recalls that they even considered cutting a hole in a bulkhead so that the towering Canadian could fit more easily into his bunk.[12]

That Robertson was not just diplomatic window-dressing is illustrated by two episodes. The most challenging part of the transit was at the western extreme of Barrow Strait, a treacherous bottleneck that Steele described as the "shallow key to the passage."[13] Narrow and shallow, Barrow Strait was even more of a navigational nightmare due to the lack of accurate charts. There was a modicum of current data, including soundings taken by *Labrador* in her 1954 transit, but Steele often had to rely on information that had not been updated since Lieutenant William Parry's expedition in the early 1820s. In *Labrador*, Robertson and his officers had developed a technique dubbed 'geomorphical navigation' by which they used the observable paths of ancient glaciers to estimate where deep-water passages might lie, and Steele selected the first transit route through Barrow Strait on that basis. It proved successful and from that beginning *Seadragon*'s navigation team later found an even more navigable deep-water channel.[14]

The second example involved practical seamanship. When *Seadragon* reached the North Pole, Steele wanted to put his crew on the ice to play baseball at the top of the world – as players circled the bases they would circle the world. He surfaced in a *polynya* with thin two-inch ice but the submarine still lay some 50 yards from the thicker ice, and Steele considered it would take "forever to break that two-inch barrier with the light oars and rubber boats." He summoned Robertson, who arrived on the tiny bridge adorned in his fur-collared orange RCN Arctic coat – "the very image of a Man of the Arctic." Steele asked if he thought it was possible to move *Seadragon* ahead through the thin ice without damaging her bow sonar. As Steele recounts the incident:

> "I think you can, but just let me go down and watch the bow for you," [Robertson] volunteered, and went forward.
>
> When I next looked there was Commodore OCS Robertson, RCN, Naval Member Canadian Joint Staff, Washington DC, and Canadian Naval Attaché, spread-eagled on deck with his head over the

> bow. One upraised arm beckoned me on. Gingerly, I gave her slight headway with the electric propulsion motors. The ice began to shatter and break as the orange-coated figure waved cheerfully, to the amusement of those on deck.[15]

It is doubtful if many other foreigners achieved such a unique position in an American nuclear submarine, and the image cements Robertson's reputation as a respected ice-expert, seasoned 'sea daddy' and trusted ally.

Commodore Robertson retired from the RCN in 1962 but retained his strong connection to the north through the prestigious Arctic Institute. From 1964-67 he served as Arctic expert for Expo 67, and then opened a consulting firm with two other retired Arctic specialists from the Canadian Forces. He remained a strong advocate for maintaining stewardship of the pristine and fragile environment of the Canadian North until his death in Oakville in 1994 at the age of 87.

What can we make of Robertson's experience? There is no doubt that he benefited from a moment of strategic and technological synergy, when the Cold War transformed the Arctic into a potential theatre of operations, and nuclear propulsion and other technologies made it accessible by sea. But he was not important because of convenience; he grasped that moment to learn how to meet the challenge of a formidable maritime environment and in doing so gained the trust of our closest allies.

Half a century later the government is again pointing the navy northward, only there is no O.C.S. Robertson to lead the way. The service has been in the Arctic only intermittently, and typical of a small, resource-challenged institution, has been unable to maintain much familiarity with the area. Robertson's legacy points to the benefit of maintaining at least a kernel of expertise. To operate patrol vessels, submarines or even hull-strengthened supply ships or tankers in or on the approaches of the Arctic successfully, it will be necessary to develop people of Robertson's ilk – perhaps with the aid of the Coast Guard which has continuously worked northern waters – but develop them we must.

Moreover, any experience should be sustained so that it is not lost over generations, as has occurred since Robertson. Hopefully this will be a natural bi-product of the Arctic/Offshore Patrol Vessels. And if another generation of Robertsons can impress our closest allies as he did – and to impress them, surely we have to walk the walk – it will motivate a more open, cooperative approach to security issues in the north, as it did in the 1950s. Individuals can carry a great deal of weight in a navy the size of Canada's,

*Commodore Robertson describes USS **Seadragon**'s historic submerged voyage under the ice.*

and as the service wrestles to find the best way ahead in the north, it can do no harm by following some of the valuable markers laid by Commodore O.C.S. Robertson.

Notes

1. Other RCN officers, notably Captain T.C. Pullen and Lieutenant-Commander J.P Croal, also developed significant expertise in Arctic operations but did not approach the stature or experience of Robertson.
2. See Michael Whitby, "Showing the Flag Across the North: HMCS Labrador and the 1954 Transit of the Northwest Passage," *Canadian Naval Review*, Vol. 2, No. 1 (Spring 2006), pp. 21-24.
3. Donal M. Baird, *The Robbie Touch: Exploits of an Uncommon Sailor* (Oakville: Baird Books, 1999), pp. 91-92.
4. Jason Delaney interview with Lieutenant-Commander P. Lloyd, RN (ret'd), 21 May 2008.
5. *Ibid*.
6. Captain O.C.S. Robertson, Draft speaking notes, ud. DHH, 81/520 Labrador 8000.
7. "Arctic Expert," *The Crowsnest*, December 1961.
8. Admiral Arleigh Burke and Vice-Admiral F.C. Denebrink, USN, quoted in "Labrador's Captain Praised for 'Outstanding Services,'" *The Crowsnest*, Vol. 8, No. 2 (December 1955), p. 18.
9. William M. Leary, *Under Ice: Waldo Lyon and the Development of the Arctic Submarine* (College Station: Texas A & M University Press, 1999), p. 185.
10. Vice-Admiral John Nicholson, USN (ret'd) to Michael Whitby, 2 September 2008. The authors are indebted to Captain Alfred S. McLaren, USN (ret'd), himself a redoubtable Arctic hand and a junior officer in *Seadragon*, in 1960 for putting them in contact with other submariners who sailed with Robertson.
11. Vice-Admiral George P. Steele, USN (ret'd), to Whitby, 11 September 2008; Captain Alfred S. McLaren to Whitby, 30 August 2008.
12. Captain Glenn Brewer, USN (ret'd), to Whitby, 1 September 2008.
13. Commander George P. Steele, *Seadragon: Northwest Under the Ice* (New York: E.P. Dutton, 1962), p. 85.
14. Directorate of History and Heritage interview with Robertson; Steele, *Seadragon*, p. 163.
15. Steele, *Seadragon*, p. 229.

Lieutenant (N) Jason Delaney and Michael Whitby are members of the team at the Directorate of History and Heritage preparing the Official History of the Royal Canadian Navy (1945-1968).

A Second Sector: Marine Defence Industries

Janet Thorsteinson

Canada needs new naval, coast guard and Marine Atlantic ships, and it needs them soon. We have grown accustomed to a politically driven, boom-and-bust cycle of military procurement in this country, with all that entails. This cycle means delayed acquisitions push up repair costs and cut into the availability of the existing fleet, shipyards are either idle or straining capacity, and, there is a contest to direct resources to favoured projects when they do become available.

Today, a new reality can and should be shaping major naval procurements. As Brent Hobson wrote in the Summer 2008 issue of *Canadian Naval Review*, "[w]hat is new today is the pace of technological change." Hulls that last for 30 years or more will see some critical IT components replaced every six months. New software will be installed every 18 months to two years. 'Harder' equipment like communications systems, sensors and weapons will all be replaced, some as often as three or four times. In fact, naval surface combatants can cost as much as four times their initial purchase price to maintain and re-equip over their lifetimes.

The reality is that Canada's marine defence industry is much more than shipbuilding and repair. A second sector of companies, largely based on high-technology, supplies everything from computer code to consulting services, from propeller designs to sonar. Big procurements like the $2 billion *Halifax*-class frigate modernization just awarded to the Lockheed Martin-led team for replacement of command and control systems, radars, tactical data links, electronic support measures and other capabilities may become less common, as those components and systems are refreshed or swapped out on a more predictable timetable.

There is a fundamental need to change concepts and perceptions from 'ships' to 'platforms,' from concepts like 'mid-life refit' to 'technology insertion' and from 'one-time spending' to 'sustained and long-term programs.' Terms like 'evolutionary acquisition' are being used to describe this process of continuous renewal. Aviation, both military and commercial, has pioneered the standardization of power supplies, connectors and space required to replace obsolete equipment quickly and easily, or reconfigure

Photo: DND

*HMCS **Toronto** refueling from CCGS **Pierre Radisson** in Arctic waters with an oil spill boom deployed during **Operation Nanook** in August 2008.*

aircraft for specialized missions. The Aerospace Industries Association of Canada recently acknowledged the importance of this kind of second sector with its May 2008 *Report of the Future Major Platforms Initiative*. In a world where there will be, at most, half a dozen major new airliner programs, the report answers the question, how does Canadian industry position itself to capture a share of that business?

Photo: DND

*HMCS **Preserver** refuels the US Navy frigate USS **Ingraham** during **Operation Apollo** in 2001. The value of the Canadian AORs extends beyond national interests as a major contribution of allied operations.*

Canada's marine defence industry sector needs to define itself and begin lobbying for change quickly. In 2005 Canada's commercial marine industries, including ports and harbours and shippers, published *Canada's Marine Industry: A Blueprint for a Stronger Future* outlining how industry and government can work together. For its part, the Shipbuilding Association of Canada has done an excellent job of defining its mission and membership. Its members and associate members are in the business of "construction, assembly, refit or repair of vessels and offshore structures."

Canada's shipbuilding policy is clear about this country's desire to maintain a domestic capability to build and repair military ships. It is time for marine industries, the second sector, to organize, survey its context, identify future opportunities, find the gaps and begin to fill them in.

The context is necessarily global, from both the demand and the supply sides. Just a glance at candidate companies for a marine industries group shows names like Thales Canada, Thyssen Krupp, SNC-Lavalin and Lockheed Martin. It would take more time and effort to define and recruit the smaller, Canadian-based companies but they too are critical to the success of a marine defence technology strategy.

There are two levels of analysis required and they can happen more or less concurrently. First, there is a need for an international survey of future opportunities in the marine defence industry sector based on known and anticipated technological advances, the potential market and the competitive environment in which sales will be made. We need to understand the structures, actual and potential, of the global naval shipbuilding and marine defence industries. Second, within Canada, there should be an analysis of current capabilities of companies working in our marine defence industry.

At that point, participants will be able to fill in the gaps, by identifying the physical infrastructure, personnel and levels of investment required to compete in the marketplace. Like other, competing states, Canada already has a range of programs and policies that could be reinterpreted or modified to help bridge the gaps that will certainly be identified.

One challenge that marine defence companies face, whether organized or not, is risk management. The federal government often prefers to allocate most or all the risk of a major defence procurement to the prime contractor. In its turn, the prime contractor minimizes its perceived risk by downloading it to sub-contractors. In too many cases, the result is a burden of risk on companies that are less able to manage it than other contract participants. As a sector, marine defence companies could develop a risk management strategy for their unique situation, and work to have it adopted by government.

The marine defence sector should work with those companies that are capable of being project leads to identify the products, technologies and projects where they can contribute. Governments, businesses and post-secondary institutions must create new ways to work together in order to optimize the collective investment and share the substantial risks of leading-edge research and development. With the capabilities that it has developed and the research cluster that has grown up around it, Memorial University of Newfoundland is an obvious lead academic partner.

Photo: CNR

A CPF module 'rolls out' at Saint John Shipbuilding in the 1990s. Hopefully, this capability can be re-created for the next generation of Canadian naval and other government vessels.

The *Future Major Platforms Report* looked at the need for what it calls "pre-competitive collaborative R&D investment," and links it to the growth of the aerospace industry. The result was a call for realignment of government support with industry needs using existing resources like the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Industrial and Regional Benefits Policy. Under the Strategic Aerospace and Defence Initiative (SADI), aerospace companies can receive more than $20 million in repayable loans for research and development on advanced technologies. Where is the marine defence industry equivalent?

The Industrial and Regional Benefits Policy was designed to serve the federal government's regional and industrial development priorities. Prime contractors must spend 100% of the contract amount on defined activities within Canada. The program can be improved and the marine defence sector, and the Canadian taxpayer, can benefit. In brief, prime contractors should be rewarded for doing higher value, longer term work within Canada. There should be fewer and more intelligent rules on the timing and ability to save or transfer benefits, and there should be some way to promote and recognize the value of partnerships, intellectual property and technology transfer.

Photo: CNR

Halifax Shipyard; an under-used capability?

Programs like the National Research Council's Industrial Research and Assistance Program (IRAP) could be guided by reason instead of rules, and by policy objectives rather than program constraints. In the case of IRAP, it could be modified to reach firms with more than 500 employees with amounts greater than $500,000. In theory at least, a larger firm should be better equipped to make good use of the funding.

The *Future Major Platforms Report* provides useful and well-reasoned arguments for a similar marine defence initiative. The following quotation refers to aerospace, but it has a direct application to Canada's marine defence sector as well:

> In particular, the Canadian industry should transform itself to foster tier 1 systems integrators and high technology content suppliers of products and services. Companies must be competitive even compared to non-traditional, emerging competitor nations.[1]

These are ambitious goals, but they are a worthy ambition for the Canadian defence industry.

Canada now has a third minority government in four years. Recent major weapons systems purchases and the continuing war in Afghanistan may weaken that government's ability to spend more on new ships. The global financial crisis may reduce it even more. That said, organizing Canada's marine defence industries is a task that must be undertaken now. Even if the contracts are slow in coming, a well-organized sector will be better positioned to win them and build a stronger and more competitive domestic industry.

Notes

1. Canadian Aerospace Industry, *Future Major Platforms Report*, May 2008.

After over 30 years in the public service, Janet Thorsteinson became Vice-President Government Relations at the Canadian Association of Defence and Security Industries (CADSI).

Making Waves

Naval Education: Vitally Important but Sadly Lacking

Ken Hansen

Peter Haydon and 'Dusty' Miller wrote editorials in the past two issues of *Canadian Naval Review* that addressed the issue of naval education and the role of this journal in furthering it. While I agree with the main argument of both their editorials, Miller's editorial is founded on the assumption that "ample naval education is taught in the naval institutions of today." I disagree with this statement. I also believe that I have the answer to Haydon's question about why *CNR* has "not made significant inroads in the navy's basic education" or "into the larger naval community out of uniform."

In a "Making Waves" article entitled "Are We a Thinking Navy?" (Fall, 2007), I lamented the lack of academic credentials amongst the naval staff at Canadian Forces College (CFC). This problem has been 'solved' by the College's move to drop the Maritime Component Program (along with its Land and Air counterparts) from its Command and Staff Course. This means that there is no longer any place in Canada where mid-rank naval students can get the professional acumen that enables them to participate in joint discussions on force structure design or operations planning.

I view this lack of naval education as a critical deficiency that will undermine the credibility of the naval argument for service-specific requirements and for naval approaches to problem solving in operations. There are naval alternatives to 'boots on the ground' interventions that have a long history of strategic effectiveness, economy and bloodlessness. The Maritime Component Program, which I headed with the cooperation of Dr. Chris Madsen for several years, was designed to develop analytical skill to assess naval issues through study of historical events of national significance. Graduates of that program were completely aware of maritime alternatives to land warfare approaches.

The move to drop the component programs at CFC was driven by the current CF dogma that there is only one joint doctrine that can be applied in all circumstances. Component programs that argue in favour of different operating concepts were evidently too confusing for tactical practitioners with little insight into the operational concepts upon which their service's tactical combat processes are based. The broader educational aspects of the CFC curriculum have been replaced with intensive training in a mechanistic approach to the planning process. This is a short-sighted approach to providing an advanced educational program. That the Armed Force Council approved this indicates that a narrow-minded approach to education pervades the highest levels of the CF.

The navy is not guiltless in this regard. Its tactical focus prizes ship command as the pinnacle of achievement. This trait indicates our leadership is disinterested in any form of study above that necessary for tactical command. This focus affects our view of history which records names, events and places but does not examine why things happened the way they did. Analytical outputs derived from history should be among the major inputs into naval doctrine. (Experimentation, academic theory, professional writing and tactical 'lessons learned' from operations and exercises are the others.) The fact that Canada does not have a national naval doctrine is symptomatic of our tactical focus. In fact, tactical procedures are frequently described as 'doctrine' in naval circles. We have not thought in conceptual terms about why we would, or how we could, undertake new missions. It was good enough that the usual pattern of employment 'fit' our alliance agreements and force commitments.

Such tactical proclivity was acceptable within the context of the environment that existed from 1910 to 1989 when countering our portion of a credible threat was the paramount operational objective. But now the globalized marketplace and the complexity of the new security environment are shaking the assumptions of naval decision-makers around the world. Those with a good conceptual understanding of maritime operations are able to adapt, with changes to their force structure and capabilities following as quickly as their bureaucratic processes and national industrial capacities will allow. Tactically-oriented strategic leaders struggle to think of convincing arguments to preserve the status quo and defend traditional employment patterns. This is a losing approach that causes the relevance of the navy to fade.

'Maritime blindness' is *not*, in my opinion, a problem caused by others for the Canadian Navy to resolve, it is caused *by* the navy's stubborn adherence to what it *thinks* are the lessons of its history. The problem is that these tactical 'lessons' are meaningless when they are outside of their historical context. Without proper analysis to

conceptualize the role, concept and function of activities, they cannot be applied effectively in what may seem like similar circumstances. In short, without a naval doctrine that is relevant to Canadians and which draws from *our* history, we will not be able to connect strategic policy direction to tactical activity in a coherent fashion.

Naval operating concepts are radically different from those of land forces because they stem from the way that the sea can be exploited for military purposes. Beyond this, sea power is a major lever at the disposal of national leaders. Knowing how to use it broadens the range of options available to government.

At the moment, there are insufficient opportunities for Canadian naval officers to achieve important career goals beyond tactics through education. Worse, there is insufficient professional motivation for them to attempt it. The result is a national institution of dwindling relevance and limited capabilities. Vice-Admiral Glen Davidson's statement, "a nation (or a navy) that does not know its history has no soul," should rank alongside "Ready, Aye, Ready" as a guiding principle for the navy.

CNR has done a commendable job of continuing the educational process begun by the Centre for Foreign Policy Studies. The problem is in raising the level of awareness of a complacent and tactically-oriented navy. There are some good vehicles to accomplish this task – the online discussion forum "Broadsides," the Centre's Maritime Security Occasional Papers series, the annual Maritime Security Conference, among others. But, these initiatives will only work slowly to create a new culture of awareness and inquisitiveness. *CNR is* being read in all the messes and institutions of the navy.

If the journal needs to include more tactical discussions to draw greater attention to it, I am all for that kind of expediency. But the vitally important requirement is for analytical works on history, both recent and distant, that can be used to form the backbone of a Canadian naval doctrine. The longer we delay, the longer it will take to adjust to the demands of the new security environment.

Shipbuilding: An Infrastructure Initiative that Makes Strategic Sense as Well

Peter Haydon

The economic crisis has become a catalyst for a variety of national and local infrastructure projects. Although this makes sense, the scope could be much broader. To those of us with maritime and oceans concerns, the crisis offers an opportunity to reverse some earlier bad decisions and put Canada back on the path to technological leadership in the maritime sector. In this, some lessons from the past and some simplified rationale for maritime infrastructure make a case for rejuvenating Canada's shipbuilding industry.

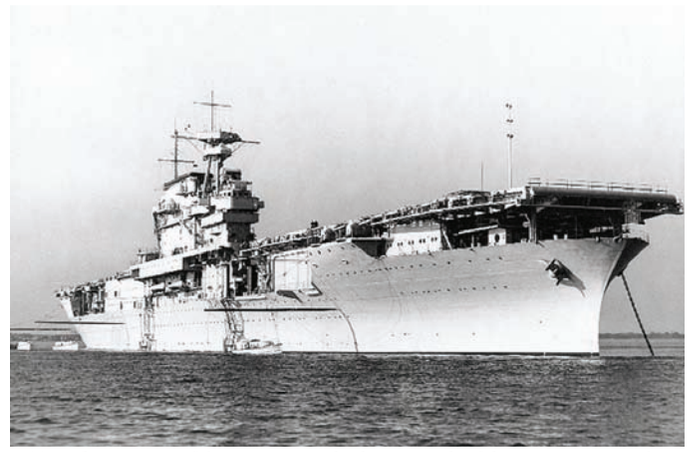
Why does the shipbuilding industry warrant special consideration? Contrary to popular belief, shipbuilding is far broader in scope than just the fabrication of ships' hulls and propulsion systems. Modern ships are complex, regardless of their purpose, and this in turn has given rise to many research and development (R&D) initiatives to increase operating efficiency and greater fuel economy. Look, for instance, at the newest generation of container ships or the highly specialized vessels used in the offshore oil and gas industry and you will see concepts in use today that were just dreams a few years ago. Modern warships need levels of versatility and endurance not anticipated 25 years ago. Only about 30% of the cost of a new warship now goes into the hull and propulsion system, while most of the rest of the price goes to the systems that give the ship the necessary operational flexibility. The result of these changes is that the shipbuilding industry now draws in a wide range of other engineering capabilities as well as the R&D community. Shipbuilding has become a truly national industry, and as evidenced by the patrol frigate program 20 years ago, includes industrial facilities in every province and most large cities. Unfortunately, subsequent government inertia and some misguided political views that Canada's new ship requirements could be met best through foreign rather than domestic contracts resulted in a downturn in the Canadian shipbuilding industry. This not only cost many good jobs in high-tech industries, but has also eroded the greater Canadian industrial base.

What can history tell us? When Franklin Delano Roosevelt became President of the United States in 1932 confronting the Depression was not his only problem. It was the most pressing problem but the deteriorating situation in Asia as a result of Japan's growing imperialism also needed attention. Within this, the 1922 Washington Naval Agreement which was supposed to create a balance of naval power in the Pacific was beginning to unravel, leaving the United States at a strategic disadvantage. In the 1920s the US Navy was in a somewhat similar situation to that in which the Canadian Navy finds itself today: a sensible policy for modernizing the fleet existed but the government of the day would not provide the funds to make it happen. In the American case, the government had embraced disarmament a little too enthusiastically while retreating from the world stage in a flurry of isolationism. In Canada, the navy

has not been given the political priority needed to ensure its continuing usefulness as an instrument of both foreign policy and national security. Roosevelt's 1932 shipbuilding program (which was soon followed by commitments to build more warships) allowed him to begin addressing the unfavourable strategic situation while creating much-needed work in an important sector of the economy. His time spent earlier as Under-Secretary for the Navy taught him not only that an effective navy was essential for national security but also that the shipbuilding industry, in its broadest sense, could be an economic stimulus for the country as a whole.

How does the Roosevelt model apply to Canada today? To answer that question we need to look briefly at Canada's strategic setting and then ask why Canada needs a navy. The strategic setting is really quite easy to understand: Canada is a large country with extensive ocean and maritime interests including dependence on international trade by sea and extensive ocean resource exploitation and management requirements. Canada has responsibility for a vast ocean area almost as big as the Canadian landmass but does not have the means to exercise that responsibility properly: there are not enough specialized ships and much of the related infrastructure does not exist. Concerns over diminishing Arctic ice and the resultant opening of the Arctic waters to mass transportation, exploration and resource exploitation are almost certainly the most pressing ocean 'management' issues today. Maintaining Canadian sovereignty and thus control over activities in those waters as well as being able to respond to the inevitable emergencies demand a Canadian government presence in all those waters. The complexity of the tasks requires that this presence be military in most situations. A Coast Guard can undertake many of the safety and simple law-enforcement tasks but is not trained or equipped to manage violence, major disasters, or foreign intrusions. Hence, much of the complex job of maintaining Canadian government presence at sea and providing the necessary deterrent to lawlessness falls to the navy.

A second dimension of the requirement for a navy comes from the need for Canada to be active globally in the interests of international security, especially the security of international trade by sea and humanitarian intervention. For much of the last 100 years Canada has used its navy to further those objectives, and will almost certainly need to do so in the future. This foreign policy role of the navy is no less important than the national security role, and is really an extension of the national security role because today no industrialized state can be an island unto itself. Events that take place far from home often have national security implications. Also, a navy is the first response to crisis and naval force has the advantage of allowing politicians a high degree of flexibility in making an initial response – a feature not shared by either air forces or armies.



*USS **Yorktown**, one of the two carriers built as a result of the 1932 initiative that later became key to winning the war in the Pacific.*

So, why does Canada need a new shipbuilding program? On the assumption that it makes sense politically to maintain an effective navy able to operate in all Canadian waters and be a versatile instrument of foreign policy, it makes equal sense to apply some of the new infrastructure funding to maintaining that capability especially where it is in danger of lapsing. In contrast to Roosevelt's long-range strategic weakness in the 1930s, the emerging Canadian strategic weakness lies closer to home. Regardless of which version of the imminence and impact of Arctic warming one accepts, the fact is that Arctic waters are changing and there will be greater general access to those waters. Without the means to enforce laws, respond to emergencies, and generally oversee the orderly use of those waters, the new frontier has the potential to be as lawless and violent as the old American West. Opportunities for resource exploitation in the northern lands are just too great. To maintain Canadian sovereignty over those waters a firm government presence, as both a deterrent and an enforcement capability, is needed now. The problem is that the present naval fleet and the Coast Guard only have a limited capability to work in those waters.

What Canada needs, sooner rather than later, is a fleet of new Arctic Patrol Vessels.

Designing and building such a vessel in Canada is a logical infrastructure project to stimulate the economy. As explained earlier, shipbuilding is a multi-disciplinary undertaking with potential benefits in just about every part of the country. To take advantage of this opportunity the government needs to move quickly through the design and contract phase and begin cutting steel as soon as possible. Because the government contracting process now moves at glacial speed some means need to be found to expedite the process. Perhaps it would be possible to rejuvenate the whole shipbuilding industry in Canada with a series of projects, to address all the present naval and Coast Guard deficiencies, on the understanding that the work will be divided up fairly among all the players. This would require an approach to contracting that casts aside the traditional politics of procurement and strives for an industrial package that is in the country's best strategic and economic interests. In this, Canada would be well advised to heed the lessons of Roosevelt's 1932 shipbuilding initiatives.

[Editor's Note: This commentary has also been published in ***Broadsides****. Go online and follow the discussion.]*

Comment on 'What is it?'
Lieutenant-Commander Christopher Robinson

The photographs on the back cover of Volume 3, Number 4 (Winter 2008) appear to be of a torpedo test ship, used for the launch and control of underwater weapons, mobile targets and test vehicles. The sonar looks pretty rudimentary and reminds me of CHIN sonars carried on earlier Soviet SSKs such as the *Foxtrot*-class. Many navies operate small ships for this type of task (as does Canada at the Canadian Forces Maritime Experimental and Test Ranges at Nanoose Bay).

The lack of bow caps on the tubes suggests that no reloads were carried and no internal tube gear would be visible if they'd been inspected during the Cold War. Perhaps Lieutenant-Colonel (Ret'd) Stinson's suggestion that OC-57 is a covert torpedo boat is closer to the truth?

Enjoyed the issue as usual – keep up the good work!

Have you joined the discussion yet?
Visit Broadsides, our online forum, and join the discussion about the navy, oceans, security and defence, maritime policy, and everything else. Visit http://naval.review.cfps.dal.ca/forum.php.

'What is it?'

Comment on 'What is it?'
Second Lieutenant Loïc Baumans

Hi. This is regarding the mysterious Russian trawler featured on the back cover of Volume 3, Number 4, and subsequent reply from Lieutenant-Colonel Stinson. It looks like an *Okean*-class intelligence vessel ('spy trawler'). Perhaps the apertures below the waterline are for the deployment and recovery of combat swimmers, or even unmanned underwater vehicles.

Just a thought, I hope we can get a definitive description eventually.

Comment on 'What is it?'
Lieutenant (N) Glenn Garry

Your 'What is it?' in Volume 3, Number 4 is a fairly easy one to solve. Like the two US YTTs employed at the Canadian Forces Maritime Experimental and Test Ranges at Nanoose, this ship is configured to be a range torpedo craft, capable of firing service torpedoes (historical note: the tubes came from a retired SSBN of the *Ethan Allen*-class).

Here is an excerpt from CFMETR: "One USN YTT Class firing craft is normally deployed to CFMETR. This 55-metre ship is fitted with submarine and deck tubes for launching of all types of torpedoes. A USN torpedo retriever boat is also on site when required for surface retrieval of ordnance. Other US vessels are assigned from time to time for special tests."

As you know, some Soviet/Russian torpedos are up to 650 mm in diameter, and thus require the very large tubes seen on the vessel. The array seen below and aft of the stem is a sonar array resembling those of a late 1950s and 1960s SSKs and SSNs but the actual gear behind the array aperture could be anything. Hope this helps.

The View from the West: String of Pearls: China's Maritime Strategy in India's Backyard

Christian Bedford

China's emergence as a global power has meant an increase in Chinese involvement in the Indian Ocean basin. From the Persian Gulf to the Bay of Bengal to the South China Sea, Beijing has increased its strategic footprint along the routes that carry the majority of its oil imports. Through infrastructure improvements, diplomatic agreements and military installations, China is seeking to create a 'String of Pearls' (SOP) to protect and monitor its vitally important sea lines of communication (SLOC). With at least 12 pearls on this string thus far, there is concern about how this will affect the balance of power in the Indian Ocean, and whether this increased Chinese presence is consistent with its stated policy of 'peaceful development,' or whether it represents the beginning of Chinese hegemony in Asia.

On the surface, China's current actions in the Indian Ocean are rational and consistent with employing *realpolitik* in its energy security policies. China is the world's second largest consumer of oil after the United States, using nearly eight million barrels per day in 2008. Furthermore, forecasters predict that between 2010 and 2020, China's oil imports will increase by 150%. Most of Beijing's oil imports come from the Middle East, Sudan and Angola, which mean they must transit the Indian Ocean en route to China. This arrangement has left China extremely vulnerable to disruptions. Starting in 2003, China began talking of its 'Malacca dilemma,' whereby the oil that lubricates its economy must pass through the Strait of Malacca, a narrow waterway that could be shut down by a terrorist attack, natural disaster, or at the behest of a foreign power. In essence, China's economic jugular is only 2.7 kilometres wide at its narrowest point, making energy and economic security tenuous at best.

Although the Malacca dilemma continues to be a worry, the rest of China's SLOCs in the Indian Ocean and South China Sea are equally vulnerable to disruption. As such, China's SOP strategy should be seen as a rational approach to a serious national security dilemma. The locations of Beijing's pearls are logical not only from a security standpoint but also from a commercial point of view. A key feature of the strategy is the upgrade and construction of ports in several countries around the Indian Ocean. This includes: the port of Gwadar in Pakistan, giving China access to a major port near the mouth of the Persian Gulf; the port of Hambantota in Sri Lanka which sits atop China's SLOC; the port of Chittagong in Bangladesh from where a planned pipeline in China can then supply energy over land; and the construction of a deep-water port at Kyauk Phyu in Burma which will reportedly be able to accommodate Malaccamax and post-Panamax vessels. These ports not only increase commercial ties between Beijing and the host countries, but also act as nodes in a larger energy security network of roads, pipelines and railways that snake across Asia.

Photo: US Navy

*USS **Chancellorville** leads PLA(N) ship **Shenzhen** (DDG 167) into Apra Harbor, Guam, during an official visit by the Chinese Navy in October 2003.*

Although much has been made of Beijing's SOP strategy and its potential to create conflict in a region already rife with tensions, it need not be viewed with suspicion. As a rising world power – expected to surpass the United States as the world's largest economy by as early as 2025 – it is normal for China to seek contacts and partnerships farther afield as commercial interests span the globe. In fact, China's strategy resembles the colonial strategies of Europe's great powers at the height of their prestige. When the UK and France were the leading industrializing powers, they established colonies across the globe, with commercial interests guiding this dash for foreign conquest. As the United States was emerging as a global player, it also established outposts from the sugarcane

fields of Cuba to the rubber plantations of the Philippines. With its pearls, China has adopted some of the features of the Western colonial system to improve its strategic positioning and enhance its commercial contacts. In this sense, China is simply acting as would be expected of a rising world power.

If China's SOP strategy is so innocuous, however, why are so many in the region worried about its ultimate intent? Although the foundation of the strategy is unquestionably infrastructure, there are several pearls that are decidedly militaristic such as bases and forward-deployed weapons systems. While the port of Gwadar is being constructed to give China access to the western Indian Ocean and to have a foothold near the mouth of the Strait of Hormuz, plans indicate that in later stages the port facility will take on a more military character, with barracks, facilities for naval vessels and possibly missile batteries. It has also been suggested that part of the negotiations with Bangladesh, Sri Lanka and Burma involved the transfer of Chinese weapons systems in order to secure lucrative contracts.

Several pearls have caused much worry for India and the United States, which are both closely watching Beijing's naval planning. China operates an elaborate listening post on Burma's Grand Coco Island from which it can monitor the movements of the Indian Navy, its natural competitor in the area. It is also widely reported that in 2005 China signed a deal with then-President Abdul Gayoom to construct a submarine base in the Maldives. If true, China would possess a forward base for its rapidly expanding submarine fleet, and would be able to counter the US strategic advantage it has gained through its base at Diego Garcia.

On the other side of Malacca, China has been busy constructing a massive naval facility. The Yulin naval base on the southern tip of Hainan Island has been the source of much speculation and concern among regional states. At Yulin, the Chinese have constructed an elaborate facility that includes an underground submarine base that has been built into the side of a mountain. This base is said to accommodate between 12 and 20 submarines, and its proximity to 5,000 metre-deep waters allows China's latest subs, among them the new *Jin*-class SSBNs equipped with 8,000 kilometre-range Julang-2 ICBMs, to disappear quickly. This appears to be an excessive amount of firepower, including the nuclear-tipped missiles onboard the SSBNs, simply to protect the country's SLOCs. Several states in the area, some of which are in dispute over the nearby Spratly and Paracel Islands, feel that the massing of Chinese naval assets on Hainan Island is the prelude to a larger Chinese power play in the region.

What to Do?

The problem with China's String of Pearls strategy is the secrecy and ambiguity under which it has been developed. Despite being pressed, Beijing has never fully explained its intentions with its naval base on Hainan Island, or why it needs a forward-operating submarine base less than 800 kilometres from India. As well, if China is truly concerned with the security of its SLOCs, why was it so slow to contribute to anti-piracy efforts in the Gulf of Aden through which some of its energy imports must sail? Many naval analysts view piracy in the Gulf of Aden as the most immediate security threat to SLOCs in the Indian Ocean, and Chinese ships and crews have been seized by Somali pirates, yet for months Beijing was hesitant to make any meaningful contribution to international efforts to tackle this problem.

Photo: Chinadaily.com.cn, December 25, 2008

*At the naval base in Sanya, South China's Hainan Province, a Chinese sailor stands guard on the deck of the missile destroyer **Wuhan**, now the flagship of the task group of two destroyers and a supply vessel assigned the mission in the Gulf of Aden against the Somali pirates.*

For India, the SOP strategy is particularly worrying as it sees itself surrounded by states with increasing ties to China. India has also watched as China constructs a rail line that will connect Qinghai province with Tibet and allow the movement of huge numbers of soldiers to the roof of India from the Chinese interior. In response to this Chinese encirclement, India has increased ties to Iran, Afghanistan, Mozambique and Madagascar where it has established similar pacts and infrastructure projects. China's moves in the Indian Ocean have also compelled New Delhi to forge closer alliances with Australia, the United States and Japan as a hedge against future Chinese tactics. This in turn has caused unease among the Chinese leadership.

While the String of Pearls strategy may help mitigate China's insecurity deriving from the Malacca dilemma, it could ultimately contribute to heightened tension and a return to a security-driven, treaty-based alliance system that could upset long-term Asian stability.

Christian Bedford is a senior analyst in the Office of the Asia-Pacific Policy Advisor, Maritime Forces Pacific Headquarters.

Plain Talk: The Process of (Not) Acquiring Maritime Helicopters

Sharon Hobson

Is there no sense of shame over the Maritime Helicopter program? Let's count the ways this program has been mauled and manipulated. First, a year after signing a contract for 50 EH-101 helicopters – 35 maritime helicopters and 15 search-and-rescue versions – the about-to-call-an-election Prime Minister Kim Campbell slashed the order to 43, cutting the project budget by a conveniently round $1 billion.

Second, two months later, in November 1993, newly elected Prime Minister Jean Chretien slashed deeper. He cancelled all 43 aircraft, claiming he was saving $4.8 billion. In reality, after all the bills for cancellation costs, the Sea King life extension, and the replacement programs are added up, this move saved nothing and effectively eliminated a decade's worth of research and development and industrial investment.

Third, this was followed by almost a decade of false starts and promises, political interference and changed rules. The Statement of Requirements was rewritten and an August 2000 announcement promised first delivery of a new maritime helicopter in 2005. The procurement strategy called for separate competitions for the airframe and the mission systems (changed to a single contract strategy in December 2002), the selection process was to be based on the lowest cost-compliant bid and an ad hoc Cabinet committee was established to oversee all aspects of the project. The project promptly fell behind schedule.

Finally, Prime Minister Chretien retires and new Prime Minister Paul Martin takes the helm. Within days a new Maritime Helicopter Project competition begins and in July 2004, a contract is announced. Defence Minister Bill Graham expresses surprise that anyone would think the process had been politicized and the Assistant Deputy Minister (Materiel) Alan Williams expresses surprise that anyone would doubt that the competition had been anything but fair. "I'm frustrated because it's really such a great win for us as a military and for the taxpayer," said Williams. "Nobody seems to want to believe me."

Everyone doubts that the helicopter will be delivered within four years. Everyone is right.

Image courtesy of Sikorsky Inc.

Artist's impression of the Sikorsky Cyclone.

There's sufficient blame to go around here for this mess. The various governments – and especially former Prime Minister Chretien – can be blamed for their militarily unjustifiable, opportunistic and costly decisions. The military can be blamed for being willing to bend the military requirement to meet political ends and ignore the blindingly obvious, and industry can be blamed for … well, let's call it exaggerating.

In the latest chapter of this never-ending saga, Sikorsky and the government have had to renegotiate the contract which was signed in 2004. The problem appears to be that the Department of National Defence (DND) selected a helicopter that did not really meet the performance requirements.

It's difficult to know exactly what happened, because DND won't talk about it, but it appears that during the pre-qualification phase, Sikorsky, which was bidding a helicopter that was still under development, was allowed to be non-compliant in some key areas. For example, while Agusta Westland and Lockheed Martin had to provide video footage of the EH-101 and NH90, respectively, showing the blade and tail automatic and manual folding procedures in order to prove compliance with the requirements, Sikorsky did not. It could not because the blade

and tail-fold capabilities were still under development. Imagine how surprised Lockheed must have been when it was told that it had not passed the pre-qualification phase, whereas Sikorsky had.

Despite the Letter of Intent guideline that the helicopter project should make "maximum use" of "off the shelf equipment," the MH-92 helicopter selected in 2004 was still largely an undeveloped military airplane. It had never flown in a military configuration, it wasn't 'marinized' and the mission system computer had yet to be developed. The military was apparently so determined to get this program underway that it was willing to accept Sikorsky's performance and delivery promises. Williams told a press conference, "We have no doubt it can be done. The model is on the production line, albeit in the commercial mode."

The Maritime Helicopter Project started out with 1,400 mandatory technical requirements but in order to speed things up during the bidding process, the project office only required that the bidders provide proof of compliance for 475. The bidders were allowed merely to state that they would comply with the other 1,000. When things started to go wrong – and they started to go wrong fairly quickly – the project office went into crisis management mode.

When I interviewed the project manager in February 2006, he told me that the preliminary design review (PDR) had been completed in January, and that the critical design review (CDR) would be completed by the first week of June. However, in September 2006, the same official conceded to another reporter that the PDR was not yet complete. The project office does not appear to have given a media interview since then.

Moreover, it turns out that because Sikorsky was unable to complete fully each milestone within the PDR and CDR, the project office subdivided the milestones so that the payments would continue to flow. Withholding payments for major capital projects tends to raise red flags amongst the bureaucrats and this is something the project office would very much want to avoid.

In late 2007, Sikorsky advised the government that it could not meet the November 2008 deadline for delivery of the first helicopter. By May 2008, stories were leaking that Sikorsky was demanding as much as $500 million more to upgrade the engines, the gearbox and the rotors in order to make the helicopter compliant with the performance requirements.

At time of writing (early December 2008), the government and Sikorsky have reportedly negotiated a new contract, but it has not yet been announced. Expectations are that the new contract provides for helicopters with upgraded engines and a first helicopter delivery date in 2010-11, 24-36 months behind schedule. No one is willing to talk about the cost, but estimates go up $200 million more than the $1.8 billion already budgeted for the acquisition phase of the helicopter project. As for the ballyhooed penalties which are supposed to be levied for late delivery, don't count on it. Sikorsky has apparently argued that the delays were not its fault because the helicopter that was accepted during the bidding phase was not compliant. When, after contract award, DND demanded that the helicopter be made compliant, Sikorsky said that would require design changes. Even if the government doesn't accept that argument, Sikorsky is unlikely to feel much pain. There's a good chance that Sikorsky included the penalty payment in its baseline bid.

It seems most of the players knew that Sikorsky could not provide a compliant helicopter for the time and money budgeted. Perhaps the only ones who didn't know the truth were the ones footing the bill – the taxpayers.

*Sharon Hobson is an Ottawa-based defence analyst and Canadian correspondent for **Jane's Defence Weekly**.*

Combined and Joint Operations from the Sea

The RAN Sea Power Conference 2010 Call for Papers

The sixth biennial RAN Sea Power Conference will be held at the Sydney Convention and Exhibition Centre over the period 27-29 January 2010. The RAN Sea Power Conference has become a significant event in the national and international maritime and security communities for its discussion on topical naval and maritime strategic issues. The broad theme of the 2010 Conference is *Combined and Joint Operations from the Sea*, and is aimed at informing how Australia's new expeditionary capabilities may be best introduced into service and used to advantage. Proposals for papers should be submitted before 6 March 2009 to Captain G.A. Andrew, RAN, to gordon.andrew@defence.gov.au and seapower.conferences@defence.gov.au. If a paper is accepted, Sea Power Centre – Australia (SPC-A) will discuss travel and accommodation expenses.

Warship Developments: A Shopping Guide

Doug Thomas

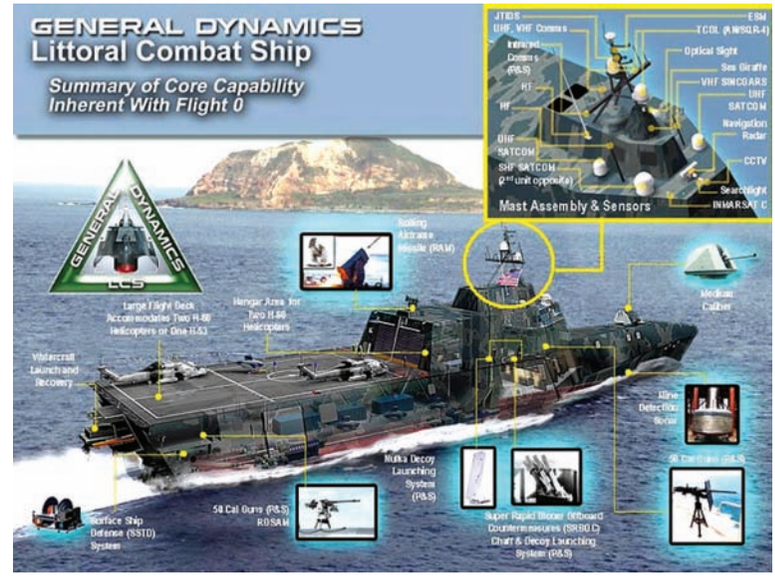
What do countries look for if they are acquiring new warships? What would your criteria be if you were shopping for a new family car? You might consider such characteristics as fuel mileage, maintenance cost and whether there is sufficient space for children and luggage.

Sought-after features in new surface combatants should certainly include economical operation, but first they must be able to fulfill operational roles – which will evolve greatly over time. Since modern destroyers and frigates will likely remain in operation for 35-40 years, new ships must be designed so that they can be easily modified to meet future requirements. During the 31-year period from 1914 to 1945 there were two World Wars and weapons and sensors underwent remarkable evolution: from fabric-covered bi-planes to the dawn of the jet age; ship-borne radar was developed and greatly affected the conduct of surface warfare; and anti-submarine warfare (ASW) changed from dropping random depth charges to attacking Hitler's U-boats with passive-homing torpedoes from long-range ASW aircraft! It is not only major wars that motivate the development of new weapons and sensors – we must assume that war at sea will change considerably by 2050 and design new ships accordingly.

Modularity

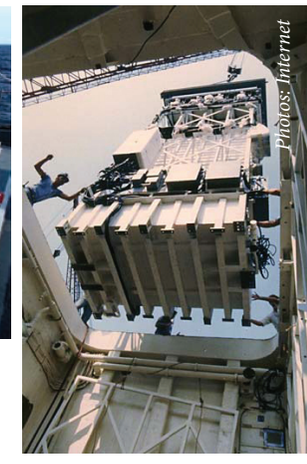
When updating warships, it is usual to modify or change weapons and sensors. The 'gold standard' method of achieving this is by replacing modules. This feature is built into the design so that modular weapons and sensors may be rapidly exchanged and the new systems are ready to 'plug and play' so that ships may rapidly re-deploy and continue operations. This concept was developed in Germany by Blohm & Voss, and MEKO frigates and corvettes are now dispersed around the world. There are other means of achieving a type of modularity. Two that come to mind are multi-purpose missile launchers, and the ability to operate a variety of aircraft from air-capable ships (for example, in recent years USN aircraft carriers have landed their strike aircraft in favour of heavy helicopters in order to conduct disaster relief operations in the Far East).

An important feature of Littoral Combat Ships (LCS), such as the USS *Freedom* and USS *Independence* (to commission in 2009), is the ability to change out systems, literally overnight, and re-role ships from anti-submarine to surface warfare or mine counter-measures (MCM). All of these configurations will make extensive use of unmanned aerial vehicles (UAVs) and, depending upon the configuration, will also operate surface and underwater unmanned vehicles. As part of the change, specialist operators and maintenance personnel are embarked as well.



A less drastic means of achieving flexibility in weaponry is with a multi-purpose vertical launcher system (VLS). It has no moving parts, unlike the single- or double-arm launchers fitted in the past, its missiles are not exposed to the elements and thus are very reliable, and these launchers require very little maintenance. The highly successful Mark 41 VLS in the Canadian *Iroquois*-class DDG, and in many NATO air defence ships, is an example of this

Mk 41 VLS System.



Photos: Internet

Photo: Internet

Artist's impression of Singapore's new frigate.

technology. The Mk 41 is available in three different configurations capable of firing surface-to-air (ESSM, SM-2) anti-ballistic missiles (SM-3), surface-to-surface missiles (Harpoon, Tomahawk), and conducting ASW (ASROC). Other navies which have developed their own vertical launch systems include Russia, China and France.

Another important consideration when designing modern warships is to minimize crew size. This can be done through automation, by fitting multi-purpose equipment and sensor displays, employing unmanned vehicles, and by cross-training ship's personnel to fill a number of positions – as in the USN's LCS. Such features permit a small ship's company to operate complex and capable ships, and in turn reduce through-life manning costs.

Photo: Internet

Artist's impression of the UXV.

Singapore's *Formidable*-class diesel-powered frigates are the size of Canada's former steam-powered DDHs but have a core crew of only 71 plus a 15-person helicopter detachment. This is about one-third the size of a steam destroyer's complement – indeed, the engineering department of the old destroyers was 60 people strong! Years ago, I was told that for every 10 sailors, one administrative person was required in the force structure. If you can reduce a ship's company from 250 to 85, you not only save 165 ship's company, you also save 16.5 people in the force structure, including training, admin, financial, medical, and another 1.65 people to look after the 16.5! These cost-reductions over the life of a ship become very significant. However, initial manning of LCS will be by two crews, Blue and Gold as in ballistic missile submarines, to support high tempo operations.

Radical-looking designs have been put forward by defence companies such as BAE Systems which has unveiled a design for a new hi-tech warship entitled the UXV Combatant. Employing stealth technology, the design – still at a conceptual stage – is described by its potential builders as a "mothership for unmanned vehicles." In service, the UXV would be designed to launch, operate and recover these unmanned devices, among them pilotless aircraft. The design of the UXV is tailored to allow its operation in a "future battle space dominated by land, sea and air unmanned vehicles." Its heritage lies in the Royal Navy's Type 45 *Daring*-class destroyer which is BAE-built and set to enter service commencing in 2009. "Using a proven naval hull form to launch, operate and recover large numbers of small unmanned vehicles for extended periods, the UXV plays the role of mother ship – a permanent base and control centre for the futuristic unmanned land, sea and air vehicles before, during and on completion of their missions." Among the UXV's features will be a pair of flight decks, a ski jump capable of being angled to different positions, a hangar located below-deck and smart munitions.

Photo: Internet

Artist's impression of an Unmanned Combat Aerial Vehicle operating from a US Navy carrier.

An unmanned aerial vehicle (UAV) development to watch is the Unmanned Combat Aerial Vehicle (UCAV). The US Navy is developing a large, carrier-based UCAV based on the technology demonstrator designated X-47B. It will be a multi-mission aircraft with a flying-wing configuration, and will operate only from large-deck aircraft carriers as they will employ arresting gear and catapults as do manned aircraft. Carrier trials are anticipated in 2011, and should UCAVs prove successful they may be integrated into conventional carrier air wings to conduct high-risk missions.

It is anticipated that the USN's LCS and the proposed BAE Systems' UXV support ship will be the world's first specialized ships for operating unmanned vehicles. We should expect that these developments will lead to drastic change in the conduct of naval operations.

Book Reviews

Violence at Sea: Piracy in the Age of Global Terrorism, edited by Peter Lehr, London: Routledge, 2007, $132.20, 274 pages, ISBN 0-415-95320-0.

Reviewed by Dave Mugridge

Piracy has become the most newsworthy of criminal acts to impinge significantly upon international maritime security. The year 2008 saw the issue of Somali piracy being addressed by UN Security Council Resolution (SCR) 1816 which allows foreign navies to patrol and to enjoy the right of hot pursuit in Somali territorial seas. With Peter Lehr's expert editorial skills and deep academic knowledge, *Violence at Sea* gives readers a comprehensive, contemporary and coherent review of modern-day piracy. By and large, the authors are not constrained by conventional wisdom or practice, offering up thought-provoking and highly persuasive arguments.

Violence at Sea presents 11 detailed yet succinct expert analyses of the multi-faceted problem of piracy. The contributors form a well-balanced combination of academics, maritime security experts and counter-piracy practitioners who focus on the regional axes of piracy and contemporary problems associated in countering this insidious problem. There are pertinent articles examining the problems associated with prosecuting piracy under international law and the developing nexus with transnational terrorism or organized crime. The UN Convention on the Law of the Sea (UNCLOS) defines piracy as a private act, conducted by individuals on the high seas. This definition has created a body of distorted statistics and legal impediments to effective prosecution.

Asia – particularly the Malacca Straits – is the location of the majority of global piracy in the world these days. In this book, however, there is a welcome multi-dimensional regional focus which establishes an excellent foundation from which to review the international tenets of the contributors. The regional nature of the problem is adequately explored from Somalia, through the Indian Ocean to the Malacca Straits, encapsulating the many socio-economic and geo-political factors which are responsible for piracy's asymmetric rise in the face of apparent conventional naval mastery.

This pleasingly detailed examination of the many reasons behind piracy allows the reader to discover that it is rarely just a motiveless criminal act. Instead it arises for a number of reasons, including failed states, corruption, poverty and opportunity. The book suggests the perpetrators are enjoying the ascendancy because the global maritime environment is a low risk but fertile and financially lucrative area from which to operate.

The nature of the threat is well dealt with in the middle section of the book and builds on the early chapters by demonstrating how circumstance and conditions have shaped the modus operandi of today's pirates. It is here we see the developing nexus among piracy, organized crime and transnational terrorism. The issue of connections among these undesirable activities is carefully handled and presented appropriately as a timely warning rather than a banner headline. But given its importance I believe an additional chapter outlining more global trends would have been apposite and appropriate.

The final section is a comprehensive review of the reactions to the rising tide of piracy. Although skeptical in its presentation, there is little to question the authority of the viewpoints or the refreshingly honest appraisal of how far the international community needs to go to address the problem. After all, unless the industrialized states both coordinate diplomatic pressure and render appropriate assistance, it is unlikely that many affected states have the ability or capital to address the multi-faceted problems associated with modern-day piracy.

In summary, this book succeeds in defining the complexity of modern-day piracy. It shocks the reader with its explicit statistics, illustrates an unwelcome side effect of globalization, advises where resources should be apportioned, and provides good old-fashioned advice on tackling this scourge.

My criticism, as noted earlier, is that it would have been nice to have had an additional chapter demonstrating the developing relationship among piracy, organized crime and terrorism. To my mind, unless the connections can be made more definitively people will remain skeptical about the relevance of maritime security until there is an atrocity akin to 9/11 from within the maritime environment to correct international 'sea-blindness.'

On balance this book is well-written and thought-provoking, challenging its readers to abandon their romanticized views of Hollywood piracy. If left unchecked, piracy will begin to cast an unwelcome shadow over more than just the unfortunate victims. International maritime security is by definition a collective response to events outside of individual state's territorial seas. I would recommend highly its inclusion as pre-deployment reading for naval readers bound for South or Southeast Asia or for those examining the capability or platform task requirements.

Two Days, Three Submarines

Jacqui Good

As Canada's naval memorial, HMCS *Sackville* represents every ship and every sailor from World War II. She stands for all the stories and all the sacrifices. But this little ship has her own particular tale to tell.

Freshly painted in white and pastel-blue camouflage, riding at anchor on a sunny afternoon in Halifax Harbour, *Sackville* looks beautiful. It's easy to understand why Lieutenant Alan Easton, her wartime captain, often referred to her as the Queen. It's less easy to connect the spic-and-span ship of today with the hard-working vessel of the past. On convoy duty, Easton thought of Sackville as less than regal but highly valued nonetheless. He wrote, "[s]he responded to an order as an affectionate dog answers her master's call. She guarded her flock and drove off the wolves." The wolves in question were the German U-boats which haunted the Atlantic Ocean, looking to destroy supply ships. Easton was the shepherd and HMCS *Sackville* the faithful dog with sharp teeth.

Let us examine one incident in *Sackville*'s war-time duty. *Sackville* was part of C.3, the unglamorously named escort comprised of the destroyers *Saguenay* and *Skeena* along with corvettes *Galt*, *Wetaskiwin* and *Louisburg*. They left Londonderry on 25 July 1942 to escort ON 115 to Canada. The Germans sent a pack of U-boats, codenamed 'Wolf,' to roam off the coast of Ireland. On 22 July, the wolves managed to sink three ships en route to Newfoundland. Since the U-boats were busy on the western side of the Atlantic, *Sackville* and company had a relatively clear passage through the middle. As a plus, *Skeena* and *Wetaskawin* sank one of the submarines that had been shadowing the group. Since they were short of fuel, those two ships headed straight for St. John's, Newfoundland, followed by *Saguenay*. C.3 was reduced to only three corvettes.

Just ahead, in the foggy Grand Banks, more U-boats lurked. They had discovered the convoy on 2 August, just as a fourth corvette arrived. *Agassiz* and *Galt* were soon off in pursuit of a sub. The rest of the group altered course to move closer to a pair of British destroyers steaming to the scene. By nightfall, six vessels were ringing ON 115. *Sackville* chased her first U-boat of the day without success.

Suddenly, two ships were struck by German torpedoes. As survivors were picked up, *Sackville* manoeuvred into position to hide the rescue work. Then a blip appeared on the rudimentary radar screen. It was something, certainly, but what? An iceberg, possibly, or, as Easton initially thought, a fishing trawler. A starshell burst in the night sky, illuminating a submarine. Before the corvette could ram it, U43 dove beneath the waves. Easton wrote:

Photo: DND

*HMCS **Sackville** during the Second World War.*

> The depth charge ... sank fifty feet and then exploded.... A moment later the bow of the U-boat broke the surface.... She rose up out of the water to an angle of about forty degrees exposing one-third of her long, slender hull ... as she hung for an instant poised in this precarious position, a depth charge which had been dropped over the stern rail exploded immediately beneath her and she disappeared in a huge column of water.

Sackville was credited with a 'probable' U-boat kill. Actually, a heavily damaged U43 made it to port. Ninety minutes later the corvette was engaged in what has been described as 'a lethal ballet' with another sub. Again, it was impossible to tell at first if the blip on the radar was friend or foe. *Sackville* zigged to ram while U552 zagged away. Easton had the ship roll so that the 4-inch gun could punch a gaping hole in the base of the conning tower. Even so, the U-boat was able to escape. This time the credit was 'possibly damaged.'

Engaging three U-boats in such quick succession was praiseworthy but there was frustration over the inability to sink them. That was largely because of the lack of modern radar. A British radar officer declared that *Sackville*'s "U-boats would have been a gift if she had been fitted with RDF type 271." As a result, many of the fleet had the new radar by the end of the year. *Sackville* herself had to wait until early in 1943.

Jacqui Good is the publicity chair for the Canadian Naval Memorial Trust.

CANADIAN NAVAL REVIEW

2009 Canadian Naval Review Essay Competition

The *Canadian Naval Review* proudly announces that the annual essay competition, the Bruce S. Oland Essay Competition, has now been expanded by a new partnership with the Canadian Naval Memorial Trust (CNMT). Beginning in 2009, the annual CNR Essay Competition will have two categories each with a first prize of $1,000.00 and a second prize of $500.00.

The Bruce S. Oland prize will be awarded the best essay that addresses some aspect of either contemporary and future Canadian naval policy and/or operations or some aspect of Canadian maritime security that is or is likely to be of direct concern to the Canadian Navy. The second prize will be donated by the Centre for Foreign Policy Studies at Dalhousie University.

The Canadian Naval Memorial Trust prizes will be awarded to the best and second best essays written on some aspect of Canadian Naval history in the period 1910 to 1990. Essays should either examine the relevance of any lessons learned to contemporary situations or provide a fresh perspective on the origins, course and implications of some event or policy.

There are no fixed subjects for either category – other than the broad guidelines given above – in order to encourage authors to explore new themes, ideas and interpretations of events and governing factors. However, in judging the submissions, relevance to those broad criteria will be a factor. Potential authors who wish guidance on subjects may contact the Editor of *CNR*.

Commodore Bruce S. Oland and the winners of the 2008 annual essay competition, Kathleen Bigney and Alexandre Wilner. Their winning essay appeared in the Summer 2008 edition of ***CNR****.*

Submissions for the 2009 CNR Essay Competition must be submitted to the Editor, CNR via email (naval.review@dal.ca), by 1 May 2009. Essays are not to exceed 3,500 words. Longer submissions will be penalized in the adjudication process. All submissions must be in electronic format and any accompanying photographs, images, or other graphics and tables must also be included as a separate file. Photographs obtained from the Internet are not acceptable unless submitted in high-definition format.

All four prize-winning essays will be published in *CNR*.

A Piece of Naval History

Since the end of the Second World War the Canadian Navy has operated three surface fleets with some overlaps as older ships were replaced. The First Fleet comprised ships built during the War and modernized for the Cold War. The Second Fleet centred on the 20 St. Laurent-class variants with the Operational Support Ships (AORs) and the 4 DDH 280-class destroyers added. The Third Fleet is made up of the 12 Patrol Frigates, the modernized DDH 280s, and the 2 remaining AORs. The 7 Tribal-class destroyers were the 'work-horses' of the First Fleet. Here is a small selection of photographs of the Tribals showing various weapon configurations. There is one image reversal that somehow has survived for many years without correction but still explains one of the gun arrangements.

The first five emails to CNR correctly identifying the ships and their differences will receive a copy of *People, Policy and Programmes: Proceedings of the 7th Maritime Command Historical Conference* (2005) which includes a paper about the destroyers.