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MASTER OF DEFENCE STUDIES (MDS) THESIS

THE CORVETTE - A SHIP FOR THE 21ST CENTURY CANADIAN NAVY

LA CORVETTE - UN NAVIRE POUR LA MARINE CANADIENNE DU 21E SIÈCLE

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ABSTRACT

This paper examines the capabilities of modern corvettes, the functions and roles of navies, the post Cold-War security environment, and the renewed focus on littoral operations. The heavy operational tempo under which the Canadian Navy has operated in recent years has highlighted the fact that it is difficult to sustain two task groups made up of up to four "large" warships. In addition, it has been demonstrated that at least 24 warships are required to provide appropriate coverage in our area of responsibility; the Canadian Navy has 16 destroyers and frigates. In order to address the shortfall in the number of platforms and the need to be able to sustain combat capable naval forces, this paper recommends that corvettes be reintroduced in the Canadian Navy's warship fleet mix.

La présente étude examine les capacités des corvettes modernes, les fonctions et les rôles de la marine, l'environnement de sécurité de l'après-guerre froide et le renouvellement des intérêts pour les opérations dans les littorales. La lourde charge opérationnelle sous laquelle la marine canadienne a fonctionné ces dernières années ont mis en évidence le fait qu'il soit difficile de supporter deux groupes opérationnels composés de jusqu'à quatre "grands" vaisseaux de guerre. De plus, il a été démontré qu'au moins 24 vaisseaux de guerre sont requis pour fournir une protection appropriée dans notre secteur de responsabilité; la marine canadienne n'a que 16 destroyers et frégates. Pour adresser le déficit dans le nombre de plate-forme et le besoin d'être capable de supporter des forces navales aptes au combat, la présente étude recommande que les corvettes soit réintroduites dans le mélange de la flotte de la marine canadienne.

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THE CORVETTE – A SHIP FOR THE 21ST CENTURY CANADIAN NAVY

*“But this much is certain; that he that commands the sea is at great liberty,
and may take as much and as little of the war as he will.”*

Francis Bacon¹

INTRODUCTION

In the September 10, 2001 edition of *Maclean's* newsmagazine, Julian Beltrame reviews the politics behind the acquisition of new helicopters for the Canadian Navy. For his article, he interviewed the Minister of National Defence. The minister explained that the East-West confrontation is behind us, and states that the Canadian Forces must look to the future, and be prepared to face new security threats. For the navy this means a new focus on asymmetric threats and littoral operations. “The Cold War is over, [Minister of Defence] Eggleton told *Maclean's*. Before, we felt we had to protect ourselves against open-water submarine warfare right into the deepest parts of the ocean. Now, we're operating mainly within 200 or 300 miles of the coast.”² The attacks on the World Trade centre and the Pentagon on September 11th are a clear indication that the world we live in is not as safe as we thought it was. North America is not isolated from international terrorists and other security threats. In order to properly defend Canadians against current and future security threats, the navy must be able to sustain combat capable forces, which can be called to perform a wide range of tasks both at home and abroad.

From a maritime perspective, as pointed out by the Minister, “In the absence of any major conventional military threat to North America, the primary sovereignty-related function of

¹ James L. George, *History of Warships*, Naval Institute Press, Annapolis, 1998, 282.

² Julian Beltrame, *The Chopper War*, *Maclean's*, Toronto, Canada, 10 September 2001, 25.

Canada's naval forces will continue to be patrols of our vast maritime approaches.”³ The vision of future maritime security operations, shared by many Western nations, is that most future operations will take place in the littoral. In the future, it is expected that most maritime nations will have a greater need to protect their maritime sovereignty and resources. Western nations also expect that most future naval international operations will be conducted in littoral waters against small or medium naval power.

In the Canadian context the protection of our littoral waters is a shared responsibility. A number of federal, provincial, and municipal police forces and agencies contribute to the protection of our maritime sovereignty and resources. With our large continental shelf the requirement for the protection of our resources move far out to sea, into our large economic exclusion zone (EEZ) and beyond. More and more, the policing role at sea is increasing in intensity. The “Turbot Crisis” in 1995 is an example of a situation, which required the demonstration of a credible military capability. Although the navy did not need to use force, in recent years other navies have fired on vessels operating illegally in their EEZ. The Japanese coastguard in December 2001 opened fire on a drug-running vessel and in 1999 “opened fire on two North Korean fishing vessels.”⁴ The Canadian area of responsibility is large and our resources to protect it are limited. Canada’s EEZ is much larger than that of its neighbour to the south; however, the resources we deploy for its protection is smaller. In the United States, the coastguard, a well-armed para-military organisation, is responsible for homeland littoral operations. The United States coastguard “comprises nearly 40,000 officers and men who

³ Canada, Department of National Defence. *Leadmark: The Navy’s Strategy for 2020*, Ottawa, Canada, 63.

⁴ Joanna Kidd, *East Asian Naval Developments*, IISS Strategic Pointers, 17 January 2002, 2.

operate”⁵ over 130 major vessels some more than 3,000 tons, the size of a light frigate. In Canada the coastguard is not armed and is mainly responsible for navigation aid and search and rescue. The protection of our littoral, the military “policing” enforcement role, is the responsibility of the Canadian Navy. In the case of a medium power navy such as Canada’s “it is normal to have both domestic and international responsibilities; it makes more economic sense.”⁶ The size of the resources deployed by the United States for its coastal defence is an indication that the maritime protection role in North America is important. The Canadian Navy must ensure that it has a sufficient number of combat capable platforms to protect our resources.

With the renewed focus on domestic defence it might be appropriate for Canada to once again look at corvettes as one possible surface platform, which could help address the shortfall in the number of warships required to fulfil domestic and international military roles. With limited resources available, “the core issue is that the trade-off in cost and performance between small size and large size must produce an aggregate improvement in operational capability for less money.”⁷ In the planning phase, if the size and capabilities of a small combatant are well managed, and planners avoid the temptation of adding too much capability, a cheap and useful platform can be built. With more - less expensive and resource intensive - combat capable platforms, it is possible to improve the overall fleet capability. The addition of corvettes to the Canadian Navy fleet could make it possible for the navy to be in a position to meet all its current and future roles and functions. The Canadian Navy should consider the acquisition of corvettes to complement its current fleet and fill some of the domestic and international littoral maritime military tasks.

⁵ Barry Clarke, et al., *Coastal Forces*, Brassey’s Sea Power, London, 1994, 3.

⁶ Peter Haydon, *What Naval Capabilities Does Canada Need?* Maritime Affairs

This paper will first briefly examine the situation of the Canadian Navy today. It will then review the history of corvettes, and some of the key characteristics and quality of modern corvettes. It will examine, from a macro perspective, the roles and functions of navies. The types of navies, from the top ranked superpowers to the many token navies, and the different class of ships found in each will be examined. With this as background, current and projected security environment in the post-Cold War era will be reviewed. With more than 70 percent of the world's population living close to the sea and the realisation that most of past and possibly future naval operations will take place in littoral waters, the paper will examine what capabilities are required to operate in that environment and what platforms are ideally suited for operations in this dangerous and restricted environment. Finally, the paper will examine in what roles and functions corvettes could be used in a Canadian context.

The Canadian Navy must be able to respond to all tasks that could be assigned by the government. The Canadian government has clearly stated its defence requirement in the *1994 Defence White Paper*. The Canadian Forces roles, and by extension Canada's navy are: the protection of Canada; Canada-United States defence cooperation; and contributing to international security.⁸ Each of these three roles will be discussed in more detail in a later section. However, the first role is particularly relevant to the discussion of littoral operation and the type of ship best suited to perform these tasks. The navy's "missions in support of the protection of Canada"⁹ can be divided in two distinct groups, one of pure military tasks to

⁷ Alfred Skolnick and David Skolnick, 31.

⁸ Canada, Department of National Defence. 1994 White Paper.

⁹ *Caught In the Middle – An Assessment of the Operational Readiness of the Canadian Forces*. The Conference of Defence Associations Institute (CDA), 2001, 35.

defend, and another group of simple assistance to other agencies. Military tasks require specific military capabilities; however, the second group of tasks requires less capability but is “often demanding in terms of manpower and ships.”¹⁰ The number and type of vessels available to perform these tasks is an important consideration in the post-Cold War era. To properly address the requirements to patrol and possibly fight at home and abroad requires an appropriate number and mix of military capable warships. What fleet mix can best support the government requirements? “Experience since the Second World War has shown that use of blue water warships for offshore patrol can be the less efficient, less capable and less economical path to follow.”¹¹ With finite human and financial resources available to fulfil the navy’s tasks, it is important to keep an open mind and look at options, which could help improve the navy’s capabilities. In order to look at the possibilities, it is important to first examine the challenges faced by the Canadian Navy today.

The Situation of the Canadian Navy Today

In recent months a number of analysts and organisations have raised public attention on the state of the Canadian Forces. With the recent terrorists attacks on the United States, specifically “on the domestic front, Canada needs to review the new challenges to its own security and defence.”¹² For the navy, the challenge to provide adequate and credible defence is enormous. The Royal Canadian Military Institute, in its recent document entitled *A Wake Up Call for Canada*, highlights some of the challenges facing the navy in the performance of domestic tasks such as the “surveillance and control of our shores and the adjacent seas [the navy

¹⁰ *Caught In the Middle*, 35.

¹¹ Clarke et al, 17.

¹² Isabel Vincent, *Canada’s Combat Incapability*, National Post, 9 November 2001, 3.

requires an] adequate numbers of modern planes and ships ... in particular, the ships should be able to catch and halt intruders.”¹³ This observation comes in part from the realisation that the Canadian Forces Maritime Coastal Defence Vessels (MCDVs) although useful platforms that perform some of the surveillance tasks, have serious limitations such as availability, limited armament, and speed. An MCDV cannot replace a warship. In a number of different analyses, it has been calculated that to properly protect Canada and Canadian interests, the Canadian Navy should have as a minimum 24 warships.¹⁴ To accomplish its mission, the Chief of Maritime Staff currently has the following major surface ships: 12 frigates, four destroyers, two replenishment ships, and 12 Maritime Coastal Defence Vessels.¹⁵ From a review of the history on naval operations, some analysts have concluded, “both quantity and quality [of warships] is usually needed, especially for any sustained conflict.”¹⁶ Canada has a modern and capable fleet, however, the number of warships is small and not sufficient to meet all requirements.

The principal situation that this paper considers is the Canadian Navy’s fleet mix and number of warships. Canadian destroyers and frigates are blue-water warships, which provides the government with assets

“that can be used widely and hopefully, wisely in the interests of global security. The question is how this can be done in the most efficient manner with the greatest return to the country, but without

¹³ *A Wake Up Call for Canada*, Royal Canadian Military Institute, Toronto, Ontario, Spring 2001, 7.

¹⁴ *Leadmark*, “Operational research consistently has demonstrated that the minimum number of warships needed to provide appropriate coverage and reaction in the Canadian areas of responsibility is 24 frigate or destroyers-type vessels. These numbers were presented to and approved by Cabinet in the course of the decision to build the Canadian Patrol Frigate – see “Maritime Surface Ship Requirements” (Privy Council Office, Cab 545-77RD, 22 December 1977). Most recently, they were confirmed ... July 1999. Interestingly, the number has remained consistent over time, despite the increasing capability of modern warships, primarily because the type and scope of challenges also has increased over time.” 66.

¹⁵ Canada, Department of National Defence, *Defence Planning Guidance 2001 (DPG 2001)*, 3-1.

jeopardizing the ability to exercise control over the waters under national jurisdiction should the need arise.”¹⁷

The requirement for relatively large warships is not in question; the challenge for Canada and the Canadian Navy is to find ways to increase the capability to meet current and future security requirements. The new focus on the domestic front might put additional pressure on Canada’s already limited resources. In the spring of 2001, the Chief of Maritime Staff testified before the House of Commons Standing Committee on National Defence and Veterans’ Affairs (SCONDVA) and indicated, “the navy will not be able to deliver its mandated level of maritime defence capability without additional resources.”¹⁸ For many military analysts it is clear, “the Canadian Forces are losing the ability to make meaningful and sustained contributions to domestic, continental, and global security.”¹⁹ In addition to the limited number of warships at its disposal the navy has personnel shortages, which compounds the readiness and sustainment problem. “For example, HMCS HURON has been tied to the dock since October 2000, partly because the Navy cannot provide it with enough skilled sailors to put to sea.”²⁰ The core problem is that in a new era with increased emphasis on protection of Canada’s coasts and international littoral operations, the Canadian Navy needs to optimize its fleet mix to improve its capabilities while living “within a finite resource base.”²¹ The department of National Defence document *Adjusting Course a Strategy for Canada*, opens the door to possible options for the future navy. In broad terms it recognises that the future fleet mix will “require versatile

¹⁶ George, *History of Warships*, 282.

¹⁷ Griffiths and Haydon, 21.

¹⁸ *Caught In the Middle*, (CDA), xiii.

¹⁹ Jim Fergusson, et al., *To Secure a Nation: The Case for a New Defence White Paper*, Centre for Military and Strategic Studies, Calgary, 2001, 1.

²⁰ Canada, Office of the Auditor General of Canada, *April 2002 Report*, Chapter 5, 3.

²¹ Canada, Department of National Defence. *Defence Plan 2001*, Ottawa, Canada, April 2001.

platforms...[and] no single one can possibly perform all roles.”²² The future fleet could include small warships optimized for coastal and littoral operations.

The Corvette – A Ship for the 21st Century Canadian Navy

The first mention of the word corvette in Canadian maritime circles immediately conjures up images of World War II vessels. For many, the image is that of vessels that were cheap, rapidly built, lightly armed, poorly equipped, with short range and poor sea keeping qualities. Some will recall corvettes manned by reservists, which played such an important and valuable role in the Battle of the Atlantic. The picture of HMCS COLLINGWOOD below is probably a good representation of the mental image many will have when they first think of a corvette.

Picture #1 - HMCS COLLINGWOOD World War II Canadian Corvette²³

²² Canada, Department of National Defence. *Adjusting Course a strategy for Canada*, Ottawa, Canada

²³ Picture from the Internet, Canada, Department of National Defence, *Project Pride History and Heritage*.

Few will imagine the fast, well armed, ocean capable “intermediate” warship class found today in many navies around the world. In some case the corvettes forms the major combatants of a navy, and in other large and medium navies, they complement larger units. In many parts of the world, navies are small and the first image of a warship is that of a small combatants. In many navies they are the biggest ship in the arsenal and therefore the first warship class in the minds of politicians and planners. In some major and medium navies however, it has been observed that there are normally only “two groups of enthusiasts [for small combatants] ... dashing young naval officers hoping to make a name for themselves, and second are frugal old politicians hoping to save money.”²⁴ In Canada it could be argued, based on history, specially with respect to the Word War II experience, that small combatants were never considered anything but a temporary necessity to fill gaps pending the acquisition of major warships. At the start of the war Admiral Percy Nelles, Chief of Naval Service, stated that corvettes “would form the stepping stones of fleet development.”²⁵ The idea behind Nelles comment was that Canada would build corvettes and trade them for larger vessels.

The image of the past is hard to break, however, fleet planners must be able to “break the old paradigms that smaller ships have short endurance, poor sea-keeping capability, and a small combat payload.”²⁶ Modern corvettes are small combatants; they come in various sizes and with different capabilities. They are cost effective platforms both from an acquisition and operating perspective, they can be built faster than larger combatants, they can be well armed, they can be well equipped with modern equipment, they can be operated by small crews, and they can have very good range and sea keeping qualities. Images of ships like Israel Sa’ar 5 Eilat (shown

²⁴ George, *History of Warships*, 239.

²⁵ Marc Milner, *Canada’s Navy: The First Century*, University of Toronto Press, 1999, 82.

below), South African Navy MEKOs, and the French C-1800 corvettes, should really be the first image planners have of modern corvettes.



Picture #2 - Israel Sa'ar 5 Eilat Corvette (American built)²⁷

Today's corvettes, like the well-armed Sa'ar 5 that is equipped with Harpoons, Barak anti-air missiles, 76 mm gun, Mk 46 torpedoes, and Phalanx, are combat capable warships, which can contribute significantly to modern navies. In the current global security environment from a resource perspective, both in terms of manpower requirements and costs, corvettes are considered to be “the most effective platform, i.e. [provides] the best bang for the buck.”²⁸

From the doctrinal point of view, in naval operations quality and quantity is important. In the United States for example, some analysts propose that smaller ships in the 1,200-ton displacement range (a small corvette), “could be affordable in sufficient numbers to meet our

²⁶ A. K. Cebrowski and Waynes P. Huges, *Rebalancing the Fleet*, Proceedings, November 1999, 34.

²⁷ Picture from Internet *Naval Technology*, The Website for Defence Industries – Navy.

continuing worldwide obligations, [and] complement our ship's force structure."²⁹ Modern corvettes offer flexibility to navies, which is one reason this class of ship is found in many navies around the world. Corvettes help navies build more numerous and capable fleets.

As Canada looks to the future, it might be time to once again consider adding this class of warship to the fleet mix. The next section will briefly examine the history of the corvette and examine the characteristics and roles of modern corvettes.

²⁸ Patrick Bright, *Corvettes Find Their Place in the Market*, Naval Forces 4/2000, 32.

²⁹ Alfred Skolnick and David H. Skolnick, *Small Ships, Advanced Technology and Warfighting Performance*, Naval Engineers Journal, May 1991, 30.

CORVETTES

Origin, the Early Years of the Corvettes

Throughout all the major periods of maritime history, corvettes have existed in one shape or form. Although the origin of the name corvette is not clear,³⁰ scholars have suggested that in its naval application, in the age of galleys, “the term corvette came from corbita, a basket ... in time the name came to be applied to a light and fast galley of one mast.”³¹ The corvettes in that period were small and fast vessels used to transport supplies.

In the age of sail, the “ship of the line”, were the major combatants at the top of the hierarchy of warships. In the 17th century, “although these ships of the line fought the major engagements, equally important were the smaller frigates and even smaller sloops, corvettes, and brigs that in most cases conducted the day-to-day operations throughout the empires.”³²

Although extremely valuable sloops, brigs, and corvettes, were not ranked with the six class of warships. Because of their size, they fell below ships of the 6th class. At first, corvettes were very small (40 to 60-feet) and armed with less than eight small calibre guns. However, as was common throughout history, over a period of time they grew in size and armament. By the early 18th century they were described as “flush-decked sailing vessel carrying one tier of 18 to 31 guns.”³³ In this period, capital ships were large and heavy, their manoeuvrability was limited and “all navies require auxiliary craft to carry out the multitude of routine functions essential to

³⁰ Canada, DND, Project Pride (Internet).

³¹ *A Naval Encyclopaedia*, Publisher Gale Research, Detroit, 1971, 174.

³² George, *History of Warships*, 59.

³³ C. W. T. Lyton, *Dictionary of Nautical Words and Terms*, Publisher Brown, Son and Ferguson, 1982, 98.

the exercise of maritime power.”³⁴ Smaller warships and corvettes performed important tasks such as escort and “often [were] employed on special missions, for example as couriers.”³⁵ The small warships, and corvettes “became firmly established in particular in the Royal Navy and in the French Navy in the late 18th century. The corvettes of those days were fast, well-armed ships used mainly for reconnaissance, convoy escort duties and as privateers.”³⁶

With the age of steam, “towards the end of the 19th century, the corvette more or less disappeared and was replaced by small cruisers.”³⁷ The focus of major navies was towards large warships, which were relatively more manoeuvrable and more importantly capable of engaging the enemy in major Mahanian style open water battles.

In the late 1910’s small warships were almost non-existent. However, “World War I brought the small combatant back into prominence for four reasons: mines, submarines, dreadnought gridlock, and simply because they could be turned out in large numbers.”³⁸ During the war, the smaller warships were destroyers, frigates and corvettes with a displacement of between 1,000 to 2,000 tons and crews in the 70.³⁹ As the war progressed and “the Germans turned their U-boats loose”⁴⁰ the focus for the Royal Navy and Canada shifted to anti-submarine warfare. In this fight the “Royal Canadian Navy’s experience was largely one of small auxiliary craft.”⁴¹ For its part the Royal Navy operated a large number of small crafts, including corvettes designed for coastal patrols and anti-submarine warfare. Notwithstanding the large number and

³⁴ Ken Macpherson & Marc Milner, *Corvettes of the Royal Canadian Navy 1939-1945*, Pub. Vanwell, 1993, 9.

³⁵ Wolfgang Brauer, *Successful Corvettes from Kiel and Karlskrona*, Naval Forces, March 2001, 40.

³⁶ Brauer, 40.

³⁷ Brauer, 40.

³⁸ George, *History of Warships*, 243.

³⁹ Bruce and Cougar, 106.

⁴⁰ Macpherson and Milner, 10.

the utility demonstrated by corvettes in World War I, during the “interwar period ... small combatants again fell on hard times”⁴² in most navies.

World War II and the Canadian Corvettes

In the interwar period the Canadian Navy barely survived. The Canadian Navy and most of its allies were not prepared for World War II. In 1939, for the Battle of the Atlantic, “the corvette reappeared as the best method of fighting German submarines.”⁴³ To face the enemy at sea during World War II “allies would build almost two thousand small escorts.”⁴⁴ These ships varied in size and included: the 1,100-ton “Flower” class corvettes; the 1,400-ton “River” class which was either classified as corvettes, super-corvettes or frigates; and the United States 1,400-ton destroyer-escorts. It is interesting to note that again the distinction between destroyers, frigates, and corvettes is hard to establish. Nevertheless, these escorts were definitely in the small combatants category.

The distinction between categories is important. In the Canadian contexts, as in World War II, the Canadian Navy evolved as “two quite distinct navies.”⁴⁵ A small professional navy controlled the key positions ashore and manned large vessels, while a more numerous reservist navy looked after the operations and manned the smaller warships. According to some analysts, “this reservist control meant that the professional service had little interest in the small-ship war.”⁴⁶ Nevertheless, at the start of the war the first priority for Canada was to protect and

⁴¹ Macpherson and Milner, 9.

⁴² George, *History of Warships*, 246.

⁴³ Brauer, 40.

⁴⁴ George, *History of Warships*, 248.

⁴⁵ Milner, 140.

⁴⁶ Milner, 129.

defend the coasts and ports. The best platforms to accomplish these tasks were small combatants and this category of warship was manned and operated by reservists.

At the start of the World War II, Canada acquired small yachts, militarised them and decided to build corvettes. Corvettes were inexpensive, could quickly be built and could be produced in large quantity. This approach suited both politicians and professional naval officers. Politicians saw a way to participate in the war effort which would provide some economic benefits for the country while limiting the number of Canadian exposed to danger; professional naval officers viewed the corvettes “only as a stop-gap until something better could be provided.”⁴⁷ From the date of its creation, professional naval officers planned and wished for a large blue-water navy made up of major warships.

At the start of the war the “Royal Navy laid plans for a new 1,200-ton, 205-foot “Flower” class corvette.”⁴⁸ The British design was based on Whale-Catcher vessels and originally these corvettes were designed for basic, close to shore defence tasks. The crew required to man these vessels was expected to be less than thirty. However, very quickly it became apparent, mainly due to the threat of submarines, that their role would be more challenging than originally expected. The ships role changed, sensors, armaments, and crew size rapidly increased. The British were quick to react. In 1940, the Royal Navy “was modifying its original corvette design to lengthen the forecastle in order to improve sea keeping and crew accommodation.”⁴⁹ Although Canada learned of the modifications to the design, it took longer to adjust. The principal role assigned to the navy at the start of the war was convoy escort and “the corvette

⁴⁷ James B. Lamb, *The Corvette Navy*, Stoddart Publishing Co. Toronto, Canada, 2000, 3.

⁴⁸ George, *History of Warships*, 247.

fleet that hustled off to Newfoundland in 1941 to escort convoys for weeks at a time across the North Atlantic was designed and built for a few days of inshore patrolling.”⁵⁰ It was only later in that year that Canada modified its corvette design. As the war progressed, new improved “Revised Patrol Vessels” and “Castles” class corvettes were introduced and joined the Mid Ocean Escort Force (MOEF). By 1942, the MOEF was operating effectively in the Atlantic. The force was responsible for convoy protection and generally a “Task Group” made up of one or two destroyers and four or five corvettes escorted each convoy. The task group provided a relatively large number of combatants, which could be dispersed around the convoy. Destroyers and corvettes worked effectively together to chase and defeat the enemy. The mix of platforms was an efficient combination, which provided both the quantity and capability required to achieve the mission. Although the World War II corvettes had far less speed and firepower than destroyers, they played an important role, “corvettes did their job just by being there.”⁵¹ Some analysts have observed, “their primary role and mission was simply presence.”⁵²

During the war, corvettes did more than just Atlantic convoy protection. Towards the end of the war, Canadian corvettes operated in dangerous littoral waters off the coasts of England and France. The littoral waters then, as today, was a very difficult environment to operate in. Corvettes with their small size, draft, and manoeuvrability, were effective warships during the D-Day landing, operating “in waters infested with mines, U-boats, motor torpedo boats (E-boats), destroyers and hostile aircraft.”⁵³

⁴⁹ Macpherson and Milner, 17.

⁵⁰ Milner, 91.

⁵¹ Macpherson and Milner, 7.

⁵² George, *History of Warships*, 250.

The Canadian corvettes were the “backbone of the Canadian Navy, ... [they were] the largest class of vessels ever to serve in the Canadian Navy: 123 in various types”⁵⁴ were used during the war. However, when the war ended most were decommissioned, these ships were “deemed too small for command by professional naval officers.”⁵⁵ Their armaments, sensors and command and control suites were limited. The crew size was small and they could not deploy out of area for long periods, these vessels did not fit into the navy’s future fleet plans.

After World War II, Canada considered the acquisition of corvettes twice, once in the 1950s and in the early 1990s. In 1991, Canada considered the possibility of acquiring 4 to 6 corvettes in a project called the Canadian Surveillance and Sovereignty Enforcement Vessel (CASSEV). As indicated in the April 1992 Defence Policy statement, the fleet was “to conduct sea patrols for protection of Canadian sovereignty, particularly with respect to fisheries, drug interdiction and Canada’s maritime economic zones.”⁵⁶ However, as the project evolved, the size and cost of the platform increased. In the end the project was abandoned, in part because of the 1990 defence cuts.⁵⁷

World wide, since the end of the Second World War, developments in corvette design and capability has continued. Modern corvettes have developed into very capable and flexible platforms. The next section will examine some of the new developments, characteristics, roles, and use of modern corvettes.

⁵³ Macpherson and Milner, 78.

⁵⁴ Macpherson and Milner, 6.

⁵⁵ Lamb, 9.

⁵⁶ Canada, *Canadian Defence Policy*, April 1992, 21.

⁵⁷ D. W. Robertson, *Scuttling the Canadian Corvette: The Case Against a Naval Acquisition*, Canadian Forces Command and Staff College, Toronto, Canada, 1993, 4.

Modern Corvettes

In today's environment corvettes are generally viewed as "small general-purpose warships with anti-submarine and anti-air capacity for use on coastal waters, and increasingly, equipped with blue water capabilities."⁵⁸ For many observers, they are considered the "next-generation of surface warships."⁵⁹ Small and medium navies are increasingly abandoning the smaller Fast Attack Crafts, in favour of the larger more capable corvette size platform. Medium and major navies have also realised the value of small combatants, particularly in the littoral environment and have or are in the process of acquiring corvettes. The size and capabilities of modern corvettes covers a wide spectrum. The following two examples serves to illustrate the point: the Singapore Victoria class corvette displaces only 300-tons and is lightly armed while the South African 3,600-ton MEKO corvette is heavily armed and is the size of a light frigate. In the upper limits, large corvettes have often all the firepower and characteristics of light frigates. At the lower end of the warship scale, the line between Fast Attack Crafts and corvettes is blurred by the combat capability offered by small modern missile systems. Corvettes can be extremely flexible and can offer a full range of combat capabilities. However, with more capabilities the cost increases and therefore most nations will prefer a mix of corvettes each with one specialist capability.⁶⁰

For medium and major navies looking at an intermediate size warship to complement their fleet, the generally accepted "classical" size of corvettes is in the 800 to 2,800 tons range. The German K-130 corvette, which will displace 1,600 tons and will have a crew of 50, is a good

⁵⁸ M. G. Muhmud, *Corvettes Still Rule the Seas for Regional Naval Forces*, Asian Defence Journal 3/2001, 29.

⁵⁹ *Tomorrow's surface combatant*, Jane's Navy International, 1 September 2001, 1.

⁶⁰ Peter Czerniewski, *Type 45 Destroyer Present and Future Capabilities*, Proceedings, September 2001, 23.

example of a modern medium navy corvette. The German government plans to acquire fifteen of these corvettes, which will be used for “anti-surface warfare (ASuW) and surveillance in littoral waters.”⁶¹ The size and characteristics of the ship are such that it will provide the German Navy with a sea going warship capable of operation independently or as part of a task group.

The size, flexibility and cost of modern corvettes make them very attractive and useful for most navies. In the United States, it has been estimated that for the price of one destroyer, the navy could acquire three corvettes. In Germany, a cost analysis indicated, “two corvettes can be purchased for the funds required to procure one frigate.”⁶² To maximize the benefits of a smaller platform, fleet planners must resist the temptation of adding too much capability into one platform. They must remember that the purpose of an intermediate platform “is not to replace the performance of large combatants but to produce a proliferation of smaller units whose numbers simplify deployment and whose performance is adequate or supportive.”⁶³ In the case of Germany Vice Admiral Lussow Chief of Staff of the Navy, in an interview in October 2001, stated “we must make it very clear that a corvette is not a frigate.”⁶⁴ Both the 6,000 tons F-124 frigates and the 1,600 tons K-130 corvettes are required in the fleet mix for Germany to be able to fulfil its international responsibilities.

The key to the success of the German corvette, and modern corvettes in general, is the new technology and concepts developed in recent years. Many new innovations helped reduced the size and complexity of weapons systems and sensors, and reduced weight and the signature

⁶¹ Joris Janssen Lok, *Surface Solutions For The German Navy*, Jane’s Navy International, Nov 2001, 4.

⁶² Skolnick and Skolnick, 40.

⁶³ Skolnick and Skolnick, 41.

⁶⁴ Lok, *Surface Solutions*, 5.

of small combatants. For example a German company has developed a “marine drone SEAMOS (Surveillance Search And Detection At Sea)”⁶⁵ to be used from corvette’s flight decks to provide over the horizon detection capabilities. The ability to collect and share the tactical picture is considered an essential capability for all warships. Corvettes could have the capability to share data with other units. This new concept was demonstrated in the Gulf War, “ships assigned to the embargo were all fitted with a U.S. computer system called JOTS (the Joint Operational Tactical System), which ... displayed a tactical picture developed at fusion centres ashore, based on a mixture of data.”⁶⁶ Corvettes are probably the smallest size combatant that could be fitted with systems such as JOLTS.

To make the best use of systems such as JOLTS, and to be an effective contributor for the recognized maritime picture of a force, warships need sensors or the means to obtain over the horizon information. Long-range sensors normally require a large platform and therefore are not suitable for corvette-sized vessels. Helicopters are another means that can be used to provide over the horizon capabilities. In recent operations and particularly in littoral operations, ship borne helicopters have proven to be extremely valuable. In many cases, they can provide both defensive and offensive over the horizon capabilities. Modern warship design allows corvettes of less than 2,000 tons, equipped with a landing deck to “temporarily carry [an] helicopter of reasonable size.”⁶⁷ Some ships, such as the British Castle class patrol vessel, which displaces 1,427 tons, can “operate helicopters of the size of a Chinook from its flight deck.”⁶⁸ Although most corvettes can support a helicopter, because of their size, they are not ideally suited for

⁶⁵ Karl-Otto Sadler, *Future Surface Combatants (FSC 2000)*, Naval Forces, 1/2000, 18.

⁶⁶ Friedman, *New Technology and Medium Navies*, 22.

⁶⁷ Clarke et al, 24.

⁶⁸ Clarke et al, 46.

sustained helicopter operations. However, in addition to the occasional helicopter operations, corvettes flight decks can use unmanned aerial vehicles (UAVs) to obtain over the horizon capability. In recent years development in UAV's have progressed rapidly. The United States Sikorrsky's Cypher, which "is a vertical takeoff and landing (VTOL), "Hands-off" smart air vehicle capable of autonomous operations,"⁶⁹ is a good example of surveillance UAV's with offensive potential that could be deployed from small vessels. Since "helicopters are very expensive and will not be available for every helicopter-capable ship"⁷⁰ the use of UAV's from corvettes could be a force multiplier. Corvettes with a flight deck can contribute and help build the maritime picture.

I addition, below the water, modern hull design of corvettes and innovations such as stabilizers makes these relatively small ships ocean capable and fuel-efficient platforms. For fuel-efficiency, the propulsion system plays an important role and in recent years the development of the all-electric ship (AES) is providing real benefit for small ships. In an all-electric ship, the "primary energy producer (gas turbine/diesel engine) are not tied to a fixed shaft or gears. There is no need to install gears at all, and the drive shafts are much shorter because the electric motors can be installed further back."⁷¹ This innovative propulsion system frees up valuable space onboard, reduces weight and allows designers more flexibility in the overall design of ships.⁷²

⁶⁹ Dave Weeks, *A Combatant for the Littorals*, Proceedings, November 1999, 29.

⁷⁰ Sadler, 18.

⁷¹ Hanspeter Hartmann, *Developments in Naval Surface Vessel Technology*, Naval Forces, March 2001, 18.

⁷² Scott Anhalt, *Surface Combatant Advanced Technology – Not Just for DD 21*, Surface Warfare, Vol.25, No 3, May/June 2000, 15.

For any warship, the primary objective is to be combat capable, and this means that the vessels must possess offensive systems and, more importantly, must have the ability to survive on its own in certain conditions.⁷³ With the proliferation of threats, especially in littoral areas, warships must have the ability to defend themselves. For small combatants, their size and stealth characteristics are a definite asset in this regard, and “the surface ship’s relative vulnerability has been significantly reduced by exploiting small size and advanced stealth design.”⁷⁴ Sweden’s Visby corvette is a good example of the integration of new materials (the ship is built of Carbon Fibre Reinforced plastic) and stealth design in small warships. The class “represents a totally new concept with revolutionary technologies in many areas, and a new approach towards meeting future requirements”⁷⁵ of small combatants in littoral waters.

Modern corvettes are small, stealthy, fast, ocean capable with transoceanic range, and combat capable. The table on the next page shows some of the characteristics that can be included in relatively small corvettes. For comparison purposes, the characteristics of the Canadian Halifax class frigates and Maritime Coastal Defence Vessels (MCDVs) are also shown.

⁷³ Peter Haydon, *What Naval Capabilities Does Canada Need?* Maritime Affairs

⁷⁴ Lok, *Corvette Trends*, 31.

⁷⁵ Ola Alfredsson, *The “Visby” Class Corvette – The Future is Now*, Naval Forces, March 2001, 44.

Canadian Frigate and MCDV, German, French and American built Israeli Corvettes

Specifications⁷⁶

	Canadian Halifax Class	German MEKO 100	French C-1800	Israeli Sa'ar 5	Canadian MCDV Class
Displacement in tons	4,750	1,900	1,800	1,200	930
Length in meters	134	91	90	86	55
Crew (note 1)	225	74 + 20	60 + 10	61	35
Draft in meters	7	3.3	3.3	3.17	3
Maximum speed in knots	> 27	> 30	> 30	33	15
Endurance in nautical miles	4,500	4,000	4,000	4,000	5,000
Major sensors		(Note 3)	3D multi-mode radar Fire control radars Towed-array sonar	Air search radar Fire control radars Towed sonar array	Navigation equipment
Command and Control system	Yes	Yes	Yes	Yes	No
Major weapons (note 2)	Harpoon VL Sea Sparrow 57 mm gun Mk 46 torpedoes Phalanx	(Note 3)	MM40 missiles VL anti-air missiles 76 mm gun ASW torpedoes CIWS	Harpoon VL Barak IAI Gabriel II 76 mm gun Mk 46 torpedoes Phalanx	40 mm gun 50 cal machine gun
Countermeasures	Nixie torpedo Chaff rocket	(Note 3)	Anti-torpedo decoys	Nixie torpedo Chaff rocket	No
Helicopter deck	Yes	Yes	Yes	Yes	No
<p>Notes: 1 - The plus sign (+) indicates the number of additional crew space available for training, special forces, other government personnel, emergency, etc.</p> <p>2 - VL is Vertical Launched.</p> <p>3 – The MEKO family of warships is built on a modular concept. The company Blohm and Voss produces and installs, ship service systems, sensor and weapon using the modular concept. To date they have more than 1,100 MEKO modules. Most frigate/corvette size sensor and weapon systems could be installed in a corvette.⁷⁷</p>					

⁷⁶ Naval Technologies, DCN International (Internet) and Jane's Fighting Ships

⁷⁷ Blohm and Voss Hamburg Shipyard. *Press Release*, 29 August 2001 (Internet)

The table above provides a good overview of the capabilities that can be built and operated in modern corvettes. The modern corvette has “evolved into cost-effective multi-purpose vessels capable of contributing to all three functions of the navy.”⁷⁸ In many parts of the world they are called upon to perform military, diplomatic and constabulary roles.

Small combatants are very effective in military roles; for example, in the Arab-Israeli conflict Israel with its fleet of small combatants has sunk or damaged over 101 ships between 1971 and 1993.⁷⁹ Russia also uses corvettes for military and diplomatic roles. The Russian Navy has a large fleet of corvettes which are used for power projection⁸⁰ and has recently introduced a new class of corvette displacing 1,900 tons with an endurance of 4,000 nautical miles “capable of operations against land-based installations, surface ships, and submarines.”⁸¹ The new Russian corvette will be equipped with a 100 mm gun, which “will provide fire support for ground forces in the littoral zone.”⁸² Modern corvettes have all the elements required to “contribute in the classic warfare regimes of anti-air, anti-surface and anti-submarine warfare.”⁸³

In the diplomatic support roles, corvettes offer flexibility to politicians. A warship is a good instrument to demonstrate the government resolves and in this regard “any warship represents is nation, regardless of size.”⁸⁴ In fact in some cases, a smaller warship is better suited for the task. Many nations in the world only possess small vessels and the presence of large vessels could be intimidating. For co-operation and confidence building missions, smaller

⁷⁸ D. N. Noullett, *Corvette: an alternative to submarine replacement*, CFCSC, Toronto, Canada, April 1995, 1.

⁷⁹ George, *History of Warships*, 254.

⁸⁰ George, *History of Warships*, 252.

⁸¹ Jane’s Navy International – March 01, 2002 (Internet)

⁸² Jane’s Navy International – March 01, 2002 (Internet)

⁸³ B. R. Linder, *The Frigate Still Fits*, Proceedings, February 1993, 36.

⁸⁴ Clarke et al, 31.

warships are well suited for the task. For example they can exercise effectively with units of the same class. Corvettes are also effective platforms for peacekeeping operations in littoral areas. In recent years, it has been observed “the most useful type of vessel for UN duties is often a lightly armed ship with good command, control and surveillance capabilities to conduct monitoring, reporting and confidence-building functions.”⁸⁵

With the increased importance of coastal resources, the destabilizing threats posed by illegal immigration, drug trafficking, and terrorism; nations around the globe are applying more resources towards coastal policing tasks. In addition to an increase in focus, to present a credible deterrence and to defend against all level of threats, coastal forces require an appropriate level of military capabilities. Corvettes are cost effective coastal patrol vessels that can perform policing function off one’s own coast or off the coast of an enemy. This application of naval power is not new, “Nelson used coastal vessels to patrol off enemy ports to give warning of their fleet’s departure form port.”⁸⁶ In modern times, new concepts and doctrines are being developed for small combatants.

As the United States changes focus from blue-water warfare to operations in the littoral, they are considering new roles for small combatants. For example, smaller vessels could be used in littoral areas, closer to shore than larger units, “as third-party targeting and weapons control platforms for long-range missiles of any type.”⁸⁷ Corvettes with ASuW and ASW capabilities can be placed between the shore and a battle or task group to provide a layer of “protection

⁸⁵ Mark Tunnicliffe, *The Revolution in Military Affairs and the Canadian Navy in the 21st Century*, Maritime Affairs, Spring/Summer 2000, 6.

⁸⁶ Clarke et al, 17.

⁸⁷ Skolnick, 113.

against surface targets and underwater targets.”⁸⁸ Another concept being studied in the United States along the line of the “Street Fighter” is the concept of acquiring small ships in the 1,200 tons range “able to handle modular payloads customized to specific mission needs and which, collectively, provide war-fighting performance unattainable from single, large ships.”⁸⁹

These concepts are being put into practice. In new German doctrine, corvettes have been completely integrated into the task group concept. In the German assessment of future threats, they believe that they might need capabilities to defend, in littoral waters, against medium or small size vessels equipped with modern anti-ship missiles. The K-130 corvettes will be optimized for ASuW and ASW tasks; they will complement the capabilities of the frigates. The typical German force package will be comprised of three frigates and three corvettes with support vessels.⁹⁰ The fleet mix of the German Navy is being optimized for littoral operations at home and abroad.

The modern corvette is a warship capable of performing efficiently most constabulary, military, and diplomatic tasks. Its integration into most navies around the world is an indication of the value of this intermediate warship in a fleet. Canada, like all maritime nations, needs a navy. The next section will examine the roles and functions of navies from a macro perspective and then will examine the different type of navy to situate the Canadian Navy in the spectrum of naval forces.

⁸⁸ Sadler, 32.

⁸⁹ Skolnick and Skolnick, 33.

⁹⁰ Jurgen Mannhardt, *Surface and Anti-Air warfare Capabilities, Concepts, and Perspectives in the German navy*, Naval Forces, 1/95, 40.

NAVIES

Functions and Roles of Navies

From a macro perspective it is important to first understand what is the role of a navy. Peter Haydon, a Canadian naval analyst, states “that navies are the instruments by which nations exercise control and influence over the ocean areas which have direct and indirect bearing on national security – in its broadest context.”⁹¹ A nation first needs to protect its citizens, its resources, and its trade (which in Canada’s case is its livelihood). To properly defend the government’s interests’ navies have roles to play domestically and internationally, recognizing that national security interests can be exercised far from one’s coast.

Ken Booth, in his book *Navies and Foreign Policy*, describes the roles of navies as a triangle with three distinct roles: military; diplomatic; and constabulary.⁹² The military role is the base of the triangle and the foundation of any credible navy. Navies must have the ability to project force and must be able to use force if required to achieve the desired objective. The military role requires a navy with credible warships that are combat capable, able to defend themselves and which can destroy the enemies or targets if and when required. The second role is the diplomatic functions navies provide to a nation. Governments in their dealings with other nations require an instrument to demonstrate their commitment or resolve. Roles under this heading can include functions such as humanitarian assistance, presence, co-operation, and confidence building. The deployment of Canadian warships to exercises with NATO and South

⁹¹ Peter Haydon, *Canadian Naval Policy: Still Stalled, Still Contentious, and Still Political*, Canadian Defence Quarterly, summer 1997, 6.

⁹² Ken Booth, *Navies and Foreign Policy*, London: Croom Helm, 1977, 15.

American nations is a good example of Canadian government interest in regional and global security. Finally, the third element of Booth's triangle is the constabulary role of a navy. This role is defined as tasks related to internal security or security and sovereignty protection. In Canada, this role is shared between many departments. However, the police forces and coast guard are not equipped or trained to face serious challenges to our sovereignty and therefore the policing responsibility of Canada's EEZ rests mainly with the Canadian Navy.

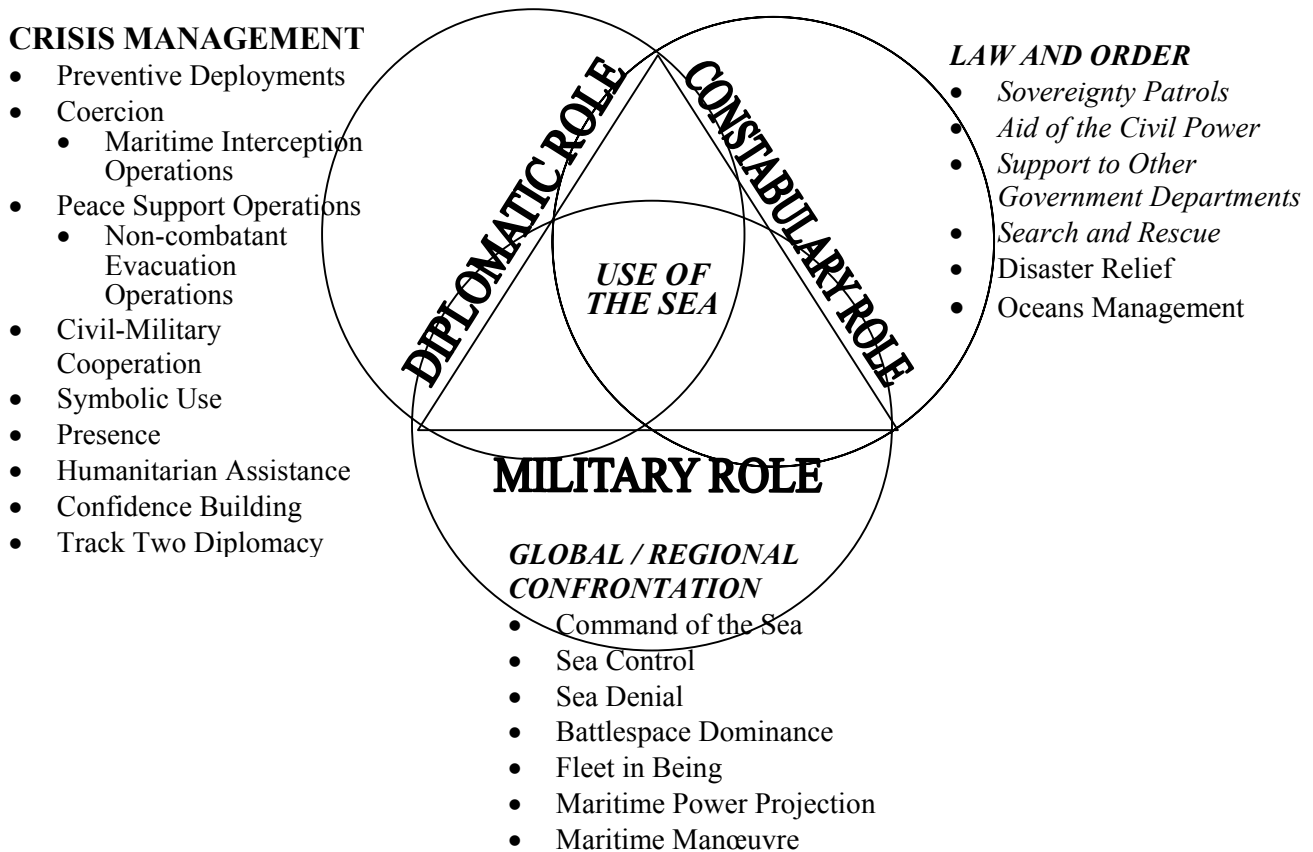
The Booth model has been refined by a number of analysts. Eric Grove overlays circles on each of Booth's role to reflect there is an overlap in the different roles.⁹³ These two models have been updated to take into account the Canadian perspective and the developments in the post-Cold War era. The Canadian Navy *Leadmark: The Navy's Strategy for 2020*, model of roles and functions shown below (figure #1), illustrates "the context within which the trinity of naval roles will be exercised in the early decades of the 21st century."⁹⁴

To fulfill all the roles and tasks listed in the *Leadmark's* model requires modern ships, which have a wide range of capabilities. Navies are mobile and can deploy in most parts of the world, they can deploy quickly to react to a crisis, they can stay on station for long period of time, they can show resolve by demonstrating their firepower capability, and they are an economic demonstration of force due to the relatively limited number of personnel required to deploy a ship or a task group.

⁹³ Eric Grove, *The Future of Sea Power*, London: Routledge, 1990, 235.

⁹⁴ *Leadmark*, 23.

Figure # 1
Roles of Navies (*Leadmark Model*)⁹⁵



Another way of looking at the three roles in the *Leadmark* model is to consider that “a modern navy has two primary functions:

(a) to ensure national security and sovereignty at sea; and

(b) to support foreign policy and overseas trade.”⁹⁶

Navies are generally well suited for these roles and provide flexible options to governments. Understandably, nations have different requirements and resources at their

⁹⁵ *Leadmark*, 23.

disposal. Although the roles of navies around the world are essentially the same, the size and shape of a nations navy varies considerably. The next section will examine the relative ranking of navies and the principal class of ships in service today.

Type of Navy

Intuitively navies are classified based on the size, number, and capabilities of warships. In broad terms they can be classified as either: major, medium, and small. With major navies capable of projecting force world wide, medium navies less capable and small navies generally limited in their ability to project force beyond their coastline. *Leadmark*, the Canadian Navy strategy 2020 document, goes one step further. In its typology for navies it uses a scale of nine which is based on both the physical capabilities of the navy, and the political will of a nation to use its navy in “out of area” operations.⁹⁷ At the top of the scale few nations have the resources and the will to field major global naval capability. The United States is without question at the top of the ranking with a truly major global naval force deployed worldwide. Russia and China both have impressive naval forces and therefore could also be included in this top group. Below the major navies we find the medium navies. For Norman Friedman, a medium navy “is medium in resources-which divide into capital and operating budgets.”⁹⁸ This definition is a good description of the Canadian Navy today. Canada does not have the resources of a super power. However, it is capable of maintaining a credible military force. On the *Leadmark* scale, the Canadian Navy ranks in-group number three, the medium global force projection group. This group is composed of “navies that may not possess the full range of capabilities, but have a

⁹⁶ Haydon, *Canadian Naval Policy*, 9.

⁹⁷ *Leadmark*, 30.

⁹⁸ Norman Friedman, *New Technology and Medium Navies*, Federation of American Scientists, RAN Maritime Studies Program Working Paper No. 1 August 1999, 2.

credible capacity in certain of them and consistently demonstrate a determination to exercise them at some distance from home waters, in cooperation with other Force Projection Navies.”⁹⁹

The bottom section of *Leadmark* ranking is made up of navies, which do not have the interest or capabilities to deploy their navy beyond their local operating areas, and navies composed of only small river or coastal patrol crafts.

To perform the different tasks that could be expected of medium and major navies, “most navies, maintain a spectrum of intra-warship type with, for example, a few sophisticated frigates many with destroyers (even cruiser) capabilities, offset by smaller frigates or corvettes.”¹⁰⁰ One notable exception is Canada, which does not have an “intermediate” warship class of the size of a corvette in its fleet. Canada, like most other medium power “nations must be prepared for a broad array of defence missions requiring a full spectrum of military capability.”¹⁰¹ To provide as much flexibility as possible to government and operational commanders, a navy should have a range of platforms at its disposal. As nations look to the future and rebuild their fleets, “somewhat ironically, and generally bucking the trend since the 1850s, with few exceptions the new ships [they are procuring have] actually [been] smaller.”¹⁰² The type of ship in use in different navies around the world today is impressive. There are many classes and variant of ships in each class. The next section will examine the principal classes of ships with the aim of identifying why navies need the different types and not why a class should be given pre-eminence over another.

⁹⁹ *Leadmark*, 30.

¹⁰⁰ George, *History of Warships*, 287.

¹⁰¹ Hans Binnendijk, *A Strategic Assessment for the 21st Century*, Joint Force Quarterly, autumn 1996, 67.

¹⁰² George, *History of Warships*, 268.

Classes of Ships

Having reviewed the classification of navies, it is appropriate to briefly examine the classes of ships generally found in major, medium and small navies. In the age of sail, warships were frequently classified in categories. The French for instance established a ranking in 1674, which had five categories of ships. Ships were ranked based on the number of decks, their weight, and the number of guns they carried.¹⁰³ In England a similar classification “was introduced by Admiral George, Lord Anson ... the rating is broken down in six rate.”¹⁰⁴ Interestingly, this ranking was further divided in two with major combatants, identified as ships with more than 80 guns, and small combatants, vessels with less firepower. This method of classifying warships survived till the end of the age of sail. When the Ironclad appeared in the mid-19th century, the classification of warships changed. The scale of six could not be used for modern warship. However, today the same principle of size, weight, and combat capability can be used as a guide for the classification of warships. Modern warships are principally divided along the lines of specialized capabilities and along the following “eight levels: battleships, heavy cruisers, light cruisers, large destroyers, destroyers, frigates and DEs, corvettes, and patrol craft.”¹⁰⁵ At the top end of the specialized warship class are the aircraft carriers. These ships are extremely capable and are the ultimate power projection platforms. Since the Second World War they have become the principal capital ships of major global force projection navies. However, few navies can afford these large and very expensive ships.

¹⁰³ Philippe Masson, *Histoire de la Marine*, Édition Charles Lavauzelle, Paris, 1981, 87.

¹⁰⁴ Anthony Bruce and William Cogar, *An Encyclopedia of Naval History*, Publisher Facts On File, 1998, 304.

¹⁰⁵ George, *History of Warships*, 279.

In the large ship category, we can also identify a number of specialized ships, mainly because of their cost and purpose they are generally only found in major and medium navies. Included in this category are the amphibious ships. These ships appeared in significant numbers and types towards the end of World War II. With the exception of the United States, which has an important quantity of amphibious ships, only a few countries have a fleet with some of these vessels. Also in this category, we find in most major and medium navies, service ships. The oilers and stores ships are the ships that are essential for any navy that wish to extend its reach far from its own territory. In addition to the large units, many navies will have as part of their fleet mix submarines and various specialized minor vessels such as mine ships and other types of auxiliaries.

With respect to the modern ranking of warships, battleship and battle cruisers are the heavy weights of the class. The ships “dominating not just naval but all military affairs for most of half a century from approximately 1890 to 1940.”¹⁰⁶ However in modern time, only one major sea battle involved these large warships, the Battle of Jutland which took place in 1916. Although Battleships have been used for shore bombardment since the end of World War II, mainly by the United States in the Korean War, Vietnam and more recently in the 1991 Gulf war, they are very few left in the world, most have been retired. Cruisers, which were the “workhorse during World War I, crucial in World War II, and the capital surface combatant during the Cold War, have virtually disappeared from the seas ... [and] may well follow the battleship into history.”¹⁰⁷ Today, destroyers and frigates are the major combatants of most major and medium navies.

¹⁰⁶ George, *History of Warships*, 88.

¹⁰⁷ George, *History of Warships*, 111.

Even though destroyers and frigates are considered the “smallest in the surface combatant spectrum of battleships, cruisers, and destroyers ... they are slowly disappearing from the seas ... most navies are now becoming frigate fleets ...frigates have now replaced the destroyers as the most numerous combatant in most navies.”¹⁰⁸ As with any classification, the cataloguing of warships is not perfect. The distinction between destroyers, frigates, and corvettes is getting more and more difficult to make. These three classes of ship are well-armed, small combatants, responsible for roles such as force protection and escort. In World War II the designation “destroyer” was given to vessels ranging in displacement from 1,000 tons to 10,000 tons.

As with the problem of distinguishing between destroyers, frigates and corvettes, the distinctions between frigates, corvettes and large Fast Patrol Crafts is difficult to make. Clearly defining what is a corvette is a challenge. Depending on the navy, a similar vessel in the 600-ton range will be called a corvette or a Fast Attack Craft (FAC). At the other end of the scale vessels in the 3,900-ton range have been designated as both frigates and corvettes. Although smaller than frigates, corvettes are by no means less capable vessels. Patrick Bright offers a good and generally well-accepted definition of modern corvettes as “fast (around 25 knots or better) well-armed ships that displace between 700 and 2,000 tons. ... generally the smallest platforms capable of accommodating the sensors, weapons, and combat systems needed to operate in a medium threat environment.”¹⁰⁹ Modern corvettes can carry a reasonably large gun, they are normally equipped with various types of missiles, and many have helicopter capabilities. These

¹⁰⁸ George, *History of Warships*, 135.

¹⁰⁹ Bright, 26.

new corvettes can be quite effective in many different type of operation, especially in restricted waters.

The number of corvettes in use around the world is impressive. “In some countries, corvettes are widely used and take important place in the fleets of surface combatant ships. Nowadays, 30 countries totally operate more than 200 corvettes.”¹¹⁰ With the trend towards smaller ships and limited defence spending world wide, it is expected that their numbers will increase. The ship building industry believes that corvettes will be an important part of the small combatants market in the coming years. It is estimated that this class of warship will represent 25% of warships orders in next two decades, which could represent an additional 87 vessels of that class in operation around the world.¹¹¹

It is important to note that corvettes, as with the other class of warship, come in different sizes and with a wide range of capabilities. The range of capability is important for this class of ship because there are “two main approaches to corvettes ... [first] countries where corvettes are the only large surface combatants (Sweden, Israel, Asian) ... [and second countries where they are] an essential supplement to larger ships (Germany, France, Japan).”¹¹² Some corvettes are therefore extremely capable and could be considered light frigates while others have a more focused and specialized war fighting capability designed to complement larger units in the fleet. Corvettes are now considered the smallest ocean capable warships and are ranked above the patrol crafts.

¹¹⁰ Andrei Arkhipov & Alexander Lovoshkin, *Market of Corvettes: the Russian Accent*, Military Parade, Nov 01, 2.

¹¹¹ Bright, 27.

Finally, at the lower end of the modern warship scale, we find the small combatants, which are normally vessels under 1,500-ton operating in the littorals. These small vessels played an important role throughout history and more recently during both World Wars where “small combatants, coastal patrol and gunboats, and not dreadnoughts, were the ships used for constant patrols.”¹¹³ The fact that most navies around the world are small, and have fleets consisting of mainly small combatants, is a factor that influenced naval operations and doctrine after World War II. Only a small number of countries can deploy and use large vessels and therefore, from a global perspective, it is “the Fast Attack Crafts (FACs) and Fast Patrol Boats (FPBs) [that] reigns over the littoral waters during [and after] the Cold War.”¹¹⁴ These small vessels are found in large quantity and are well suited for littoral operations. These ships “represent a low cost, high capability platform that could address lower level missions”¹¹⁵ and therefore they have been the platforms of choice for navies with limited resources.

These small units can hide near the coast and have a manoeuvrability advantage in littoral water. However, they are becoming more and more vulnerable, “as the threat from helicopter-launched weapons and sea skimmers has risen dramatically in the last decade, the traditional FAC has proven too small to carry an adequate air defence system.”¹¹⁶ An interesting development is taking shape in this Post-Cold War era. The lessons learned from the Gulf War, such as “the annihilation of Iraq’s FAC flotilla by helicopter-launched anti-ship missiles in 1991,

¹¹² Arkhipov & Levoshkin, 2.

¹¹³ George, *History of warships*, 239.

¹¹⁴ Joris Janssen Lok, *Corvette trends turn the tide – The re-emergence of Heavily Armed, Small Surface Combatants*, Jane’s International Defence Review, 4/1998, 26.

¹¹⁵ R. J. Hitesman, *Fast Patrol Boats: a Necessary Addition to Canada’s Maritime Force Structure*, Canadian Forces Command and Staff College, Toronto, Canada, 1998, 1.

¹¹⁶ Antony Preston, *The Booming World of Fast Attack Crafts, Corvettes and Frigates*, Armada International, 2/2000, 27.

has led to a perceived tactical obsolescence of the naval lightweights.”¹¹⁷ Small navies are looking at replacing FPBs and FACs with larger ships. Some analysts “have argued that the Gulf experience confirms the need for larger and more capable FPBs, perhaps approaching the size of Corvettes, which would have space for better defensive sensors and weapons.”¹¹⁸ This observation is validated by recent acquisition trends around the world. When it comes to the acquisition of small combatants, navies around the world are generally acquiring vessels with bigger displacement, better command and control, sensors and weapons. For example, medium and major navies such as those of Germany and China, as part of their modernization program, are “not replacing older FACs one-for-one, preferring to switch resources to bigger ships capable of operating far from coastal waters.”¹¹⁹ The renewed interest in corvette size warship can be attributed to two main drivers, first the obvious economic dimension of operating and sustaining smaller units and second the perceived future use of naval forces. Before examining in more detail the roles characteristics and use of modern corvettes, it is important to understand the new post-Cold War security in which navies will be expected to conduct most of their operations. The next section will examine the security environment projected for the future.

New Era, the Post-Cold War Security Environment

The end of the Cold War caught most government off guard. For more than forty years the West had a clear enemy, the Soviet led Warsaw Pact. “During the Cold War, NATO’s role and purpose were clearly defined by the existence of the threat posed by the Soviet Union.”¹²⁰ To defend against that threat, the Canadian approach was geared towards collective defence. On

¹¹⁷ Lok J. J., *Corvette trends turn the tide*, 26.

¹¹⁸ Clarke et al, 12.

¹¹⁹ Antony Preston, *The Booming World of Fast Attack Crafts*, 46.

its own, it would be very difficult to defend Canada if attacked; only as part of the NATO alliance could Canada present a credible defence. The principle of collective defence continues to be a key element of Canada's defence strategy. However, what is changing is the threat. In the future, the threat is not expected to come from a super power but rather could come from a number of smaller "rogue states", criminal organizations, and terrorists. The world we live in is probably less safe than just a few years ago. New technologies and doctrine are affecting the global security environment.

For many Western countries the end of the Cold war marked a new era in defence. First impressions were that the world had arrived at a new period of stability, a new world order was expected which would require fewer resources directed towards defence. In the early 1990's the trend for most navies translated in "declining defence budgets, [the assessment of a] radical shifts in threat composition (not easier but different and more diverse) and [the realisation that they had an] inadequate fit of current naval assets to projected threats."¹²¹ This assessment is particularly interesting as it also applies to the United States, the world only super power. One of the conclusions of the Skolnik analysis is that the United States should be looking at smaller more economical warships to better prepare for future operations. For many analysts, future maritime operations will be in areas relatively close to land and "several navies have recently begun to emphasize littoral warfare, particularly the United States Navy."¹²²

¹²⁰ *NATO in the 21st Century*, NATO Office of Information, Brussels, 6.

¹²¹ Skolnick and Skolnick, 31.

¹²² K. B. Warren, *A Littoral Frigate for the Canadian Navy*, Canadian Forces Command and Staff College, Toronto, Canada, 1999, 4.

The United States is looking at the future and in their analysis the “Navy estimates suggest that 70 percent of the world’s population lives within 200 miles of a coastline. The littoral thus has the potential to contain numerous future hotspots around the globe.”¹²³ With the shift from a possible East-West confrontation to threats of security from anywhere in the world a closer attention to the littorals is warranted. Many analysts suggest that “historically, the littoral area has been of great importance in naval warfare, and it is likely that the near-land environment will dominate naval warfare in the future.”¹²⁴ For the United States, *Joint Vision 2020* recognises that in the future they will likely conduct most operation with allies. Although the United States Navy is very large and capable, it does not have sufficient resources to “go anytime anywhere”. The United States will need allies to help provide more platforms, specially in the envisioned littoral operations where “in the world of tomorrow, smaller - and more numerous - on-scene forces can be the key to meeting our diverse global requirements at varying levels of intensity.”¹²⁵ The United States is not alone in its assessment of future trends towards littoral operations; the United Kingdom has also arrived at the same conclusion.

In its assessment of the post-Cold War threats, the United Kingdom concludes that for the immediate future they have no identifiable direct threat. They have also seen the changing security environment and have noticed that the new challenges to international security have generated an increase in operational tempo of their force. To promote global stability, they intend to remain proactive and engaged in world security issues, independently if required, but most likely as part of multinational efforts. Therefore, they do not anticipate significant reduction in the operational tempo. It is clear from Britain’s *Strategic Defence Review* that for

¹²³ Scott Bowden, *Forward Presence, Power Projection, and the Navy’s Littoral Strategy*, IRIS, 3.

¹²⁴ Warren, 1.

the Royal Navy “the emphasis will move from large scale open-ocean warfare to force projection and littoral operations.”¹²⁶

The United States and United Kingdom assessment serves as examples of the new security environment. Throughout NATO the “two themes coming to typify 21st century naval operations are that they will be Multinational, and they will occur in the littoral.”¹²⁷ Norway and Germany are also coming to the same conclusions and are building fleets to be able to fulfil their “international obligations”. From a naval perspective this means that nations willing to participate in global security issues must have forces that can fulfil both domestic and global roles. Throughout the world, “most navies still have a spectrum of a few large destroyers or frigates with more smaller frigates and a few corvettes or patrol boats.”¹²⁸ Larger vessels are generally used in the international role, while smaller patrol boats are used in domestic roles. A trend that is emerging is that modern corvettes are being used in both domestic and international roles, sometimes integrated as part of a task group. For Western navies, which during the Cold War were focused on blue-water anti-submarine warfare, the new security environment means “a shift from a potential blue-water confrontation with a super-power, to a focus on small and medium threats in littoral regions.”¹²⁹ Canada’s allies are changing with the new environment, “the [NATO] Alliance has also taken on additional responsibilities, including the task of addressing threats to European security from regional and ethnic conflicts.”¹³⁰ The Canadian Navy’s participation, with allies, in recent naval missions such as sanction enforcement,

¹²⁵ Alfred Skolnick, *Exploiting Defence Technology After the Cold War*, Proceedings, November 1990, 117.

¹²⁶ United Kingdom, *Strategic Defence Review*, 4.

¹²⁷ *Leadmark*, 71.

¹²⁸ George, *History of Warships*, 279.

¹²⁹ Warren, 2.

¹³⁰ *NATO in the 21st Century*, 3.

interdiction operations, and support to ground forces ashore, suggest that in recent years the focus of Canada's naval operations has been changing to littoral operations.

As other Western nations have observed, for Canada there exists a "lower requirements on instant readiness for general war. Conversely, there are increased requirements for dealing with low-intensity conflicts in a destabilized Third World and on countering terrorism interdicting drug smuggling, and conducting other quasi-military activity."¹³¹ The fleet mix required to effectively counter these threats needs to be examined.

Canada should follow closely new developments in fleet composition and new doctrine for littoral operations. Operating in the littorals will present new challenges for naval forces. Fleets of small vessels defend many of these areas; some of these small combatants have advanced weapons systems. New doctrine, and vessels will be required to face the littorals threats. The perceived future threats and operations "emerging [from the new] security environment calls for an ever-increasing focus on the close-in littoral."¹³² For major and medium navies the question is now how to optimize a fleet for operations in the littorals. In the United States for example some "analyst argues that the Navy should focus more on small surface ships, including light missile frigates, ASW corvettes, and coastal submarines with strong air-defence and anti-mine armaments."¹³³ Currently the United States has few warships of less than 3,500-ton. Professional naval officers who are reviewing plans and scenarios are considering concepts where certain roles and missions could be assigned to small combatants.¹³⁴

¹³¹ Skolnick, 113.

¹³² Cebrowski and Huges, 32.

¹³³ Bowden, 5.

¹³⁴ George, *History of warships*, 239.

In future littoral operations, coalitions forces will be looking for more small combatants. Navy that requires influencing events in the littoral, or want to participate must understand what is the littoral environment. They must understand what are the challenges and what platform or combination of platforms is required to be successful in such an environment.

The Littoral

In the new post-Cold War era many nations are reviewing their naval strategy. As part of their review, many have realised that they need to optimize their naval forces for littoral operations. For the United States, the littoral area could extend out to sea as far as the maximum range of their weapons, which means for them up to 1,000 miles from the coastline.¹³⁵ The area referred as littoral is not precisely defined and therefore, nations have different interpretation of its definition. The United States “maximum range,” however, is generally not accepted as a good description of the littoral area. The more common description is that of an area which covers from 100 kilometres in land and extends to 200 nautical miles out to sea.¹³⁶ From a military perspective, this definition better describes the maritime threat area where throughout history, with few exceptions, “the great majority of the world’s most famous battles have been fought.”¹³⁷

The Cold War and the threat of an East-West confrontation was so dominant in the past fifty years that medium and major navies tended to pay little attention to the littoral. For smaller navies, however, small ships and littoral operations have been and are still very important. For example “during the 1982 war in Lebanon, the Israeli Navy with their small combatants, played

¹³⁵ Bowden, 14.

a critical support role, conducting amphibious landing near Sidon.”¹³⁸ Around the world coastal operations is the major role of navies, in the West “the renewed emphasis on littoral operations outside of the familiar European theatre does raise many significant issues that were downplayed during the Cold War.”¹³⁹ Operating close to the enemy’s territory coast is dangerous, “littoral warfare brings its own challenges. Over 100 nations possess anti-ship missiles ... over 45 nations possess submarines,”¹⁴⁰ many nations possess Fast Attack Craft armed with anti-ship missiles, the threat of shore based air forces and missiles is important in many parts of the world. To counter these threats, naval forces require combat capabilities and manoeuvrability in restricted waters. In such an environment, platforms can be viewed as fortresses with lots of firepower or small “warships could be viewed as nodes in a theatre-wide combat system.”¹⁴¹ In the latter option, it is envisioned that larger ships would be stationed further off shore with smaller more manoeuvrable units providing the external ring protection and combat capabilities closer to shore.

In the future it is expected that “surface forces will almost inevitably find themselves operating in littoral areas.”¹⁴² As seen in recent years, the tasks of shipping escort, which was successful done during the Iran-Iraq war, conducting coastal patrols and maritime interdiction operations, such as in the Gulf, where “over a 10-month period, more than 165 ships from 14 allied nations challenged more than 10,000 merchant vessels and boarded about 1500 to inspect

¹³⁶ *Leadmark*, 1.

¹³⁷ Clarke et al, 9.

¹³⁸ Charles Perkins, *The Israeli Navy Sails Into a New Era*, Jewish Virtual Library, 1.

¹³⁹ John Pike, *Rest-of-World Naval Forces*, Federation of American Scientists, Washington, 2.

¹⁴⁰ Neil Baron and Barry Tibbits, *Topside design of Warships: a 100 Year Perspective*, Naval Engineers Journal, Vol. 111, No 2, March 1999, 37.

¹⁴¹ Baron and Tibbits, 38.

¹⁴² Friedman, *New Technology and Medium Navies*, 16.

manifests and cargo holds”¹⁴³ are good examples of possible future littoral operations. These tasks are consistent with tasks that have been assigned to the Canadian Navy in recent years and it can be expected that in the future the Canadian government will continue to require naval capabilities to contribute to littoral operations. For the Canadian Navy, Operation Apollo is a good example of coalition littoral operation.

The capabilities that the Canadian task group brings to the coalition are valuable and contribute to the overall success of the operation. However, the contribution to be useful to allies must be sustainable for a long period. At present it is estimated that the Canadian naval contribution to Operation Apollo will last at least two years. It will be a significant challenge for the Canadian Navy to sustain the task group, in its present form for two years. For a medium navy such as Canada’s, maintaining a task group composed only of relatively large warships is extremely demanding. To be able to influence the events in littoral regions, navies or coalitions, must possess warships in sufficient quantity. Quantity does matter, and “during the 19th Century era of Pax Britannia, the largest classes of warships in the Royal Navy were not battleships or cruisers, but frigates, corvettes, and sloops.”¹⁴⁴ Small combat capable combatants are resource efficient and are effective force multipliers. Corvettes in particular, because they are the smallest warship class, which is large enough to support reasonable self-defence and offensive capabilities, offer great flexibility to fleet planners. Small combatants have proven throughout history that they are valuable, effective, combat capable warships. The next section will examine if such a platform would be a good addition to the Canadian Navy’s fleet mix.

¹⁴³ Clarke et al, 10.

¹⁴⁴ George, *History of Warships*, 10.

THE CANADIAN CONTEXT

With the longest coastline in the world rich in resources to protect, and a government willing to use its navy abroad, the Canadian Navy must be able to maintain and sustain a sufficient number of warships. As it has been observed by some defence analysts, “the core problem, of course, is that it is becoming increasingly difficult for the Canadian Forces to meet the call.”¹⁴⁵ The Canadian government expects of its navy that it be a combat capable force. It must be able to protect Canada, defend North America principally in cooperation with the United States and increasingly with other Central and South American countries, and contribute to international security. For the maritime forces this means contributing to the three naval roles: military, diplomatic and constabulary, in an efficient and sustainable way.

Roles of the Canadian Navy

To perform the tasks in the overlapping military, diplomatic, and constabulary roles, the Canadian Navy needs a fleet of combat capable warships. With the recent renewed interest in “homeland defence”, to protect Canada the navy might be called upon to increase its military patrol and presence along the coasts. The defence of Canada from a maritime perspective, requires a fleet mix that is optimized for both military and assistance to other government departments. As was observed by the Conference of Defence Associations, “the second category of tasks is often demanding in terms of manpower and ships.”¹⁴⁶ Frigates are well suited for military tasks. However, for assistance tasks, they are relatively large and might not be the most resource effective vessels for these low-end military and constabulary roles. This observation

¹⁴⁵ Fergusson et al, 10.

¹⁴⁶ *Caught In the Middle*, CDA, 35.

can be extended to tasks the navy has been called upon to perform in support to the international security role.

Since the end of the Cold War, the Canadian Navy has participated in a number of international security operations, in the Persian Gulf, the Adriatic, and Haiti. The latest being Operation Apollo, where a large portion of tasks have been in support of maritime interdiction operations. Canada's contribution in this type of role is valued by allies and is important as illustrated by the fact that "40% of the 1,700 hailing"¹⁴⁷ in the early phase of Operation Apollo were done by Canadian ships. The contribution of the Canadian task group, in Operation Apollo is meaningful and appreciated however, for Canada the sustainment of a task group comprised of frigates and destroyers is proven to be challenging.

Combat capable warships are required to support operations at home and abroad. They also have a role to play in the American context. It has been suggested that in the coming years, Canada "will find itself taking greater interest in hemispheric-related security issues."¹⁴⁸ The department of foreign affairs recognises the importance of the Americas for Canada. It states in its policy document *Canada in The World* that "security organizations can lead in this field, through confidence-building measures working with organization such as ... the OAS (Organization of American States)."¹⁴⁹ The occasional deployments of one or two frigates in South American waters is a good first step however, as the Americas become more important to the government, the Canadian Navy should consider doing more. One of the recommendations in the Centre for Military and Strategic Studies, *To Secure a Nation* report, is that "a Canadian

¹⁴⁷ Mike Blanchfield, *Canada's Warships Hunting Al-Qaeda*, Ottawa Citizen, March 2, 2002, 1.

¹⁴⁸ Vincent, 2.

security and defence review should re-evaluate Canada's role in the western hemisphere with a view towards a comprehensive expansion of that role."¹⁵⁰

The roles and tasks of navies have not changed significantly since the end of the Cold War. Navies must perform domestic and international military, diplomatic and policing tasks. What has changed is the renewed focus on littoral operations and the increased operational tempo. As Canada looks to the future, it will be important to optimize the Canadian Navy's fleet mix to ensure that it is capable of fulfilling all its domestic, continental and international roles.

The Canadian Navy Fleet

The times when the Canadian Navy could be described as the third largest navy in the world are long gone. Since the end of World War II, the Canadian Navy fleet mix has centred on blue-water warships. By the late 1970's the fleet was composed of gate vessels, for the reserve force, mine sweepers, mainly used for regular force training, and a fleet of twenty-four destroyers and frigates. As stated earlier, twenty-four warships have always been considered the minimum number required for the fleet. In 1977 the government approved a "programme to replace the entire fleet of twenty four destroyers and frigates."¹⁵¹ With the end of the Cold War Western nations, significantly reduced defence spending. In Canada "the defence budget has dropped more than 30% in real term in less than a decade."¹⁵² One of the casualties of the budget cuts was the plan to replace the warship fleet. Today, the Canadian Navy has sixteen destroyers and frigates. Of these sixteen ships, a number have been placed in "extended

¹⁴⁹ Canada, Department of Foreign Affairs and International Trade. *Canada in the World*, 1999, Chap 4, 2.

¹⁵⁰ Fergusson et al., 14.

¹⁵¹ Kenneth P. Hansen, *Cease Fire, end Fire Mission, Forever? The Canadian Decision to Abandon Naval Fire Support*, Canadian Military Journal, Vol. 1 No. 3 Autumn 2000, 49.

readiness” status mainly due to the limited personnel and operation and maintenance resources available to the navy.

In addition to major warships, the Canadian Navy has twelve Maritime Coastal Defence Vessels (MCDVs). These small vessels were acquired to replace both the gate vessels and mine sweeper fleets. MCDVs have been designed as mine warfare vessels. They have a limited mine counter measures and route survey capability and are principally used as training platforms for both regular and reserve forces personnel. The vessels perform search and rescue and sovereignty patrols but their defence capabilities are limited. Their size, speed, command and control, sensors, weapons, manning (see table #1) reflect the fact that they can only perform military and policing roles in the most benign threat environment.

The Canadian Navy has warships capable of performing only the essential roles and tasks assigned to it. With the current fleet mix, the navy does not have the capability to sustain forces for all the domestic, continental and international roles. In addition, they do not have the minimum number of warships required to perform their roles. The only credible warships in the fleet mix capable of performing effectively all types of roles and tasks are the sixteen frigates and destroyers. The government and navy should consider options to ensure that the Canadian Navy is prepared and able to meet the challenges of the 21st century.

¹⁵² David Bercuson, *Review of Defence Priorities Long Overdue*, National Post, 9 November 2001, 1.

Options for the 21st Century Fleet Mix

The Canadian Navy should be provided with more resources or needs to find better ways to accomplish its current and future tasks. The current warship fleet mix of destroyers and frigates provides to the government and military commanders excellent combat capable capabilities. However, the number of platforms is not sufficient to meet all of Canada's domestic and international tasks. To address the shortfall in platforms and capabilities, the government and force planners could:

- (a) consider the statusquo and do nothing;
- (b) consider the procurement of more frigates; or
- (c) consider the procurement of corvettes.

The events and operational tempo the Canadian Navy has witnessed since the end of the Cold War is a clear indication that the end of the East-West confrontation did not bring world peace. The world we live in, and the forecast for the future, indicates that nations will continue to have a requirement for credible combat capable forces. Canada, as a middle power, will continue to have a requirement for a credible maritime force capable of contributing to the protection of Canada's sovereignty and able to offer options to the government as it pursue its foreign policies. The government expects that the Canadian Navy, when called upon will be capable of providing and sustaining credible forces. The government could consider the statusquo. However, this option would be recognition of the navy's current limitations. From the *1994 White Paper* it is clear that the government wants to have the capability "to participate effectively in the defence of North America, NATO-Europe allies, and victims of aggression

elsewhere.”¹⁵³ The statusquo is not a valid option; the government wants sustainable combat capable maritime forces.

To ensure that the Canadian Navy can fill all its tasks the government could consider the reintroduction of the cancelled third batch of Canadian Forces Frigates (CPF). An additional six frigates with its associated personnel and operations resources would provide the navy with a sufficient number of warships, personnel and resources to fulfill all of its responsibilities. One of the main reasons why the third batch of CPF was cancelled was because of costs. Although the government recognizes the need for more platforms, it must operate within a finite resource envelope. Even with the increased threats to North America and the focus on “home land defence” following the September 11th terrorists’ attacks on the United States, the Canadian government does not appear prepared to significantly increase defence spending. The option of acquiring additional frigates, with the additional resources required to operate them, is not a viable option for a government, which intends on spending just enough on defence.

A warship fleet made up of frigates and destroyers is expensive to maintain and operate. In Canada, for most military, diplomatic and policing tasks, the only option available to government and commanders is to deploy one or more, relatively large warships. For tasks where the military threat is small, such as in most assistance to civil authority situations, and most maritime interdiction operations, frigates and destroyers do not offer the best value for money. This is one reason why in many navies an intermediate class of warships is integrated in the fleet. These smaller cost effective ships supplement the capabilities of larger units. When it is appropriate, they are used to perform maritime tasks. Modern corvettes offer credible combat

¹⁵³ 1994 *Defence White Paper*, 12.

capabilities. These small combatants are relatively cheap to build and can be sustained for a fraction of the costs and resources required for frigates and destroyers. In a fleet, they offer flexibility. Government and commanders can use the smaller corvettes independently or in support to others.

Over the next few years, as the government and the Canadian Navy considers the replacements for destroyers, frigates and MCDVs, they should consider the acquisition of corvettes. The modern corvette is capable of performing efficiently most diplomatic and military tasks assigned to a medium power navy. Ocean capable corvettes could contribute significantly to the defence of Canada, continental defence and international security. The addition of this class of ship in the Canadian fleet mix would provide the government and commanders with additional flexibility. Corvettes would increase the capability of the navy by providing more combat capable platforms and increasing the ability to sustain a combat capable naval force.

CONCLUSION

Since the end of the Cold War the Canadian Navy has been tasked to perform a number of domestic, continental, and international security related missions. The security environment we live in and the expectations for the future indicate that Canada needs to maintain a combat capable navy. The recent terrorists attacks in the United States have brought home the realisation that North America is not an island and direct security threats against Canada are possible. The Canadian Navy must have the capability to defend Canada's interests both at home and abroad. The heavy operational tempo under which the Canadian Navy has operated in recent years has demonstrated the need to be able to sustain a combat capable naval force for a long period of time. The operational tempo has also highlighted the fact that it is difficult for the Canadian Navy to sustain two task groups composed of up to four "large" combatants. In addition, for domestic operations, it has been demonstrated that at least 24 warships are required to provide appropriate coverage in Canada's area of responsibility. With its current fleet of 16 destroyers and frigates, the Canadian Navy does not have sufficient platforms and resources to properly perform all its domestic and international roles.

Since the early days of maritime history, small combatants have played a significant role in most navies. These fast, small, resource effective vessels have been used to complement larger units. They performed escort duties and were used as the eye of the fleet. They were particularly effective in the shallower water of the littorals where most of the naval battles have taken place. In World War II, corvettes formed one of the largest class of warships and performed admirably both in mid-ocean and in the littorals.

Over the years, the functions and roles of navies have not changed significantly. Navies are expected to perform military, diplomatic, and policing roles. For major navies this translates into having the ability to project power world wide, while for small navies the only requirement is to be able to demonstrate limited military capabilities in local waters. The range of warships used to perform military functions and tasks varies with larger units found only in major naval forces. In the post Cold-War security environment, with the renewed focus on homeland defence and littoral operations, medium and small navies are considering or moving towards fleets composed of smaller class of warships. More and more, the tendency for medium navies is to build fleets with frigates and corvettes as their main combatants. Smaller navies are increasingly shifting from the smaller Fast Patrol Boats to the larger more capable corvette class vessels.

The Canadian Navy is a medium navy capable of projecting force worldwide. The roles and functions assigned to the Canadian Navy do not differ from those expected of most medium power navies. The Canadian government wants a combat capable force that can contribute to the protection of Canada and international security. The Canadian Navy must be able to respond to domestic and international security situations and must be able to sustain a combat capable force. With the limited resources available for defence, the Canadian Navy must ensure that it optimizes its fleet mix to provide the best bang for the buck.

The current warship fleet mix of destroyers and frigates provides to the government and military commanders excellent combat capabilities. However, the number of platforms is not sufficient to meet all of Canada's domestics and international tasks and it is becoming more and more difficult to maintain the force. To address the shortfall in the number of warships and to

improve the sustainment capability of the Canadian Navy, the government and force planners should consider the procurement of corvettes. Modern corvettes are fast, well armed, ocean capable, and resource efficient. The addition of corvettes to the Canadian Navy fleet could make it possible for the navy to meet all its current and future roles and functions.

The Canadian Navy's *Strategy 2020* document clearly identifies the requirement to “complete the transformation of Canada’s navy from a Cold War service specializing in anti-submarine warfare to a balanced, agile and highly adaptable force, capable of providing government with a wide range of crisis response options.”¹⁵⁴ The reintroduction of the corvette into the Canadian fleet mix is an option worth considering for the 21st century Canadian Navy.

¹⁵⁴ *Strategy 2020*, 62.

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