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FLEXIBILITY AND AFFORDABILITY: THE NEED FOR AN OFFSHORE PATROL VESSEL FOR CANADA

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AIM

1. The aim of this service paper is to examine the need within the Royal Canadian Navy (RCN) for a multirole Offshore Patrol Vessel (OPV). The service paper will consider the likely composition of the RCN in the future as well as its role as described in current naval doctrine. OPVs currently in use within other navies will be considered to investigate what role a modern OPV could serve within the RCN.

INTRODUCTION

2. The purpose of this service paper is to address a potential capability gap that will exist within the RCN following the decommissioning of the HALIFAX Class Frigates and the KINGSTON Class Maritime Coastal Defence Vessels. The capabilities and roles of the new Arctic Offshore Patrol Ships will be evaluated as well as potential outcomes of the Canadian Surface Combatant (CSC) project. It is likely that Canada will experience a significant decrease in the number of platforms within the Navy. Other nations such as the United Kingdom and Australia have added OPVs to their fleets to provide a cost effective means of achieving their defence objectives.

3. The paper will first consider the current as well as future roles for the RCN. It will then describe the current capabilities of the existing Fleet. These will be contrasted against what the projected size and capabilities will be after the new vessels enter service and the older classes are decommissioned. OPVs that have recently entered service with other modern Navies will be considered in regards to their potential use within the RCN.

DISCUSSION

Naval Roles and Functions

4. Leadmark: The Navy's Strategy for 2020 defines the RCN as a "Medium Global Force Projection Navy." As such the RCN is "a navy that may not possess the full range of capabilities, but has a credible capacity in certain of them and consistently demonstrates a determination to exercise them at some distance from home waters, in cooperation with other Force Projection Navies."[1] The document goes on to define three broad roles for the RCN: "protecting Canadians; defending North America in cooperation with the United States, and contributing to international peace and security."[2]

5. Leadmark outlines a range of more specific functions for a navy that fall under three headings: diplomatic; constabulary, and military. Each heading has a range of roles such as command of the sea, sea control, fleet in being, coercion, maritime interception operations, presence, sovereignty patrols, was well as search and rescue to name a few. As Canada is defined as Medium Global Force Projection Navy it is not expected that all of the roles defined under the Leadmark Model will be able to be fulfilled but many will be able to be addressed fully or in a limited fashion.[3]

6. In 2005, the RCN provided an update to Leadmark as much had changed in the world following the attacks against the United States in 2001. This document reiterates many of the roles and functions from Leadmark. It indicates that the "traditional lines

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[1] Canada. Chief of the Maritime Staff et al., *Leadmark: The Navy's Strategy for 2020* (Ottawa: Directorate of Maritime Strategy, NDHQ/Chief of the Maritime Staff,[2001]). 28.

[2] *Ibid.*

[3] *Ibid.*, 34.

between security and defence have blurred: in many ways they have merged." [4] The 9/11 attacks highlighted the importance of the "home game" where we must remain cognisant of ensuring domestic security. It is very important for both Canada's defence and bilateral relationship with the United States that we protect our long and exposed "Ocean Frontiers."[5]

The Current Fleet

7. Canada's current Navy consists of 12 Halifax Class Frigates, 12 Kingston Class Maritime Coastal Patrol Vessels (MCDV), and 4 Victoria Class Submarines. Canada's destroyers and replenishment ships have reached the end of their service life and only one, the HMCS ATHABASKAN, remains in service. The RCN originally had four destroyers and two replenishment ships and it was with these ships that Canada's ranking in Leadmark was based.

8. The MCDV design is a compromise between mine counter measures and patrol functions. These are versatile small ships that perform a variety of missions but they are limited by their low maximum speed (15 knots) and the sea conditions within which they can operate. They have very limited combat capability and are best suited to performing functions under the diplomatic and constabulary roles.

9. The backbone of the Canadian Fleet has been its destroyers and frigates. These multirole vessels are able to perform a wide range of functions under all three naval roles.

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[4] Canada. Chief of the Maritime Staff et al., *Securing Canada's Ocean Frontiers: Charting the Course from Leadmark* (Ottawa: Directorate of Maritime Strategy, NDHQ/Chief of the Maritime Staff,[2005]). 4.

[5] *Ibid.*, 5.

They provide the Government with ships that can be used for a wide range of tasks to satisfy national interests.

10. The RCN was able to field task groups consisting of a replenishment ship and a mix of frigates and destroyers. The primary difference between the destroyers and the frigates was the longer range weapons that were employed by the destroyer which allowed them to perform area air defence for the task group. As it stands right now Canada is not able to field a task group as the RCN lacks both replenishment ships and destroyers.

The Future Fleet

11. The RCN has embarked on multiple ship building projects under the National Shipbuilding Program (NSP) which includes both naval as well as Coast Guard vessels. The RCN is building Arctic Offshore Patrol Ships (AOPS), Joint Support Ships (JSS) and Canadian Surface Combatants (CSC). The AOPS has entered the construction phase with the intention to build 5 vessels (based on budgetary restraints the project could deliver 4 vessels but if the build goes well then the potential exists for 6). JSS remains in the design phase with 2 vessels expected. The CSC project has entered the definition phase and there remains much uncertainty on the final design and number of ships that will be built.

12. The AOPS project initially started with a mandate to deliver between 6 to 8 ships but this number has been reduced due to several factors. Ship building is subject to a high rate of inflation and the long duration of the project has resulted in an erosion of the buying power of the original budget. In addition the Canadian ship building industry is

very weak and significant investment is needed to develop the infrastructure and workforce needed to build large ships. In an effort to keep the project on track, the original design has had many requirements scaled back and capability reduced.[6]

13. The current contract calls for the construction of five AOPS. The ships are larger than the current frigates with a displacement of almost 6000 tons. The maximum speed has been reduced in the design with it currently listed at 17 knots. The hull design is a compromise between one optimized for ice breaking and patrol. The result will be a ship that has some ice breaking capability but which will be slow. Model testing has shown that the hull form will have poor seakeeping performance and hence stabilizing fins were added. The Canadian Naval Review has questioned if the ship is an acceptable compromise.[7]

14. The CSC project is to replace both the IROQUOIS and HALIFAX Classes. The project is in the process of selecting a design. This project is facing budgetary challenges which have come to light in the media recently.[8] This project has a mandate to produce up to 15 ships although the original number of frigates and destroyers was 16. If the budget is not significantly increased it is likely that both the capability and number of ships will have to be reduced. The size of modern frigates and destroyers has grown since the construction of the HALIFAX Class and most range between 6000 to 8000 tons.

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[6] Ryan Dean, "Arctic Offshore Patrol Ships: Adrift in Inflationary Waters," *Canadian Naval Review* 11, no. 2 (Spring, 2015).

[7] Sharon Hobson, "Is A/OPS an Acceptable Compromise?" *Canadian Naval Review* 7, no. 4 (Winter, 2012), 41.

[8] CBC News, “Warship cost could rise to $30B, Vice-Admiral Mark Norman confirms,” accessed 21 January 2016, http://www.cbc.ca/news/politics/warships-30-billion-navy-mark-norman-1.3347145.

Modern weapon systems are much more complex and expensive as well. Given the current fiscal climate it is unlikely that there will be large increases to defence spending.

Future Capability Gap

15. The MCDVs are nearing the end of their useful life and will only be replaced by the AOPS. This could mean a reduction of 7 platforms in the Navy. The IRO Class destroyers will all be decommissioned by 2017. The HAL Class has an average age of 26 years; these ships were initially designed to operate for 30 years but will likely be able to operate to 40 years. The HALIFAX Class frigates are designed much differently than previous classes as their hulls make use of modern high strength steel. This steel allowed for a thinner and much lighter structure but it also has a higher risk of fatigue cracking and the thin hulls have less corrosion margin. The likely outcome will be that it will be much more costly to repair them later in life and the RCN may find it more difficult to operate this class of ship past 30 years of service.

16. By 2030 it is likely that the HAL Class will start to decommission. By then many of the new CSCs should be operational. If there are not significant increases then it is unlikely that CSC will deliver more than 10 platforms. The result will be a decrease of a fleet of 24 frigates, destroyers and MCDVs to a fleet of 15 CSCs and AOPS.

17. If the size of the fleet does decrease then the RCN will be very hard pressed to complete the functions that have traditionally been undertaken by the Navy. The Coast Guard is undergoing modernization as well but their number of vessels is not going to increase either. The Coast Guard has received 9 new Mid Shore Patrol Vessels but these are rather small vessels with limited range and endurance. These vessels are only to

operate 120 nautical miles from shore. In addition it must be remembered that the Canadian Coast Guard is very different from the US version. Canada's coast guard is a rather small organization that is unarmed. Their primary purpose is to ensure the safety of shipping through maintaining navigational markings and routes (ie ice breaking services). They also play a large role in search and rescue. This means that the RCN cannot expect the Coast Guard to assume roles that the RCN is no longer able to perform.

True Offshore Patrol Vessels

18. Many modern Navies are building offshore patrol vessels. This class of ships is a very broad one with ships from 500 to 5000 tonnes in the class. To operate in a truly offshore environment in Canadian waters the lower limit on size is going to be in the 1500 tonne range. Range, seakeeping and capability are going to rule out smaller vessels such as the new Coast Guard Midshore Patrol Vessels.[9]

19. The RIVER Class of OPVs that is under construction in the UK is a good example of a modern OPV.[10] These vessels are approximately 2000 tonnes which is one third the size of AOPS and have a similar range. The vessels have a slightly larger armament than AOPS with a 30mm cannon, two mini-guns as well as 50 cal mounts. This is not to say that more offensive weapons could not be considered for such a ship. Many modern navies have larger guns such as 76mms and missiles installed on OPVs. As with AOPS they can land on a large maritime helicopter. The Royal Navy (RN) plans to

[9] Canadian Coast Guard, "Mid Shore Patrol Vessels," Accessed 21 January 2016, http://www.ccg-gcc.gc.ca/Vessel-Procurement/Mid-Shore-Patrol-Vessel.

[10] Reuters, "BAE Systems wins £348 million contract for new UK patrol ships," accessed 26 January 2016, http://uk.reuters.com/article/uk-britain-bae-systems-idUKKBN0GB28B20140811?feedType=RSS&feedName=domesticNews&WT.tsrc=Social+Media&WT.z_smid=twtr-reuters_co_uk&WT.z_smid_dest=Twitter&dlvrit=59196.

use these vessels for functions such as fisheries patrols, counter terrorism and counter piracy. Of note the class has a much higher maximum speed than AOPS (20-24 knots vice 17). These vessels are less expensive than the AOPS with the latest batch of three costing £350M. The AOPS budget is currently set at $2.8B for five ships.[11] While a direct cost comparison is difficult due to exchange rates and differing costs of labour in British and Canadian ship building industries it is clear that the British ships will cost less than half what AOPS will cost.

20. As the hull of the RIVER Class will be optimized for patrol it will have superior seakeeping characteristics and endurance. Their higher maximum speed will allow the vessels to perform a wider range of roles than AOPS. An example is the role of counter piracy. Vessels conducting missions of this nature in locations such as the Gulf of Aden often respond to ships that are under attack from pirates. A vessel such as AOPS that is only capable of a maximum speed of 17 knots will be hard pressed to successfully intervene and prevent the pirates from successfully taking a vessel. A multipurpose OPV on the other hand would be ideal for this type of role. The use of frigates and destroyers for this role and others such as fisheries patrols is an inefficient use of an expensive platform.

21. The use of OPVs would not only be less expensive for initial acquisition but also in terms of in-service costs. An OPV could operate with a crew in the 50 to 80 range which would represent a huge savings in terms of personnel considering a frigate destroyer needs in excess of 200 personnel. At less than half the size of a HALIFAX

[11] Office of the Parliamentary Budget Officer, "Budget Analysis for the Acquisition of a Class of Arctic/Offshore Patrol Ships," accessed 26 January 2016, http://www.pbo-dpb.gc.ca/web/default/files/files/files/AOPS_EN.pdf.

Class and one third the size of an AOPS, an OPV such as the RIVER Class would be much more economical to steam. Lastly the general maintenance costs would be reduced again due to size but also due to less complexity in the ship systems.

CONCLUSION

22. The RCN is facing a significant reduction in the number of platforms it will potentially have after the HALIFAX and KINGSTON Classes are removed from service. Unless the government increases the budgets for the AOPS and CSC projects they will not produce the 28 vessels that will have left service. While both AOPS and CSC will be more capable than the classes that they will replace this increase in capability will not mitigate the reduction in available ship numbers.

23. The result of this potential reduction in fleet size will be a reduction in the capacity of the RCN to complete its mandate both abroad and at home. Many modern navies are adding OPVs to their fleets to allow a more balanced range of capability at a reduced cost. OPVs can perform many of the roles and functions listed in the current Canadian naval doctrine.

RECOMMENDATION

24. It is recommended that the RCN investigate the potential benefits to adding a class of OPVs to its fleet. A class of OPVs would be able to perform many roles and functions which would free up future frigate/destroyers to perform missions that they are better suited to such as integrating with American Carrier Battle Groups. The smaller OPVs would have smaller crews and smaller operating costs. The RCN would be able to complete its mandate more efficiently. The building of a class of OPVs would provide

Canadian Shipbuilders with another opportunity to maintain their skills and workforces to ensure that the benefits of the National Shipbuilding Program are realized.

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