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THE NEED FOR SUBMARINES IN A VOLATILE SECURITY ENVIRONMENT

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JCSP 45

Service Paper

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PCEMI 45

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DS545 COMPONENT CAPABILITIES

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By Commander C. Michalski

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Word Count: 2,585

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Nombre de mots : 2,585

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AIM

1. Although the Royal Canadian Navy (RCN) has been successfully deploying submarines for decades, there is an ongoing discussion¹ as to whether or not they are the right assets in order to contribute effectively to the RCN's mission. The aim of this service paper is to demonstrate to the Director General Naval Strategic Readiness that the RCN needs to maintain its submarine fleet. This analysis will show that submarine capabilities and attributes are required by the Canadian military based on security goals described in the current strategic papers of the Canadian Government, the Canadian Armed Forces (CAF) and the RCN and will emphasize the submarine's great value to naval operations.

INTRODUCTION

2. "Strong. Secure. Engaged" (SSE) is the credo of Canada's current defence policy.² This vision embodies Canadian military contributions at home, in North America and around the globe. Within this geographic theatre, the CAF must be prepared to conduct eight core missions:

Detect, deter and defend against threats to or attacks on Canada;

Detect, deter and defend against threats to or attacks on North America in partnership with the United States, including through NORAD;

Lead and/or contribute forces to NATO and coalition efforts to deter and defeat adversaries, including terrorists, to support global stability;

Lead and/or contribute to international peace operations and stabilization missions with the United Nations, NATO and other multilateral partners;

Engage in capacity building to support the security of other nations and their ability to contribute to security abroad;

Provide assistance to civil authorities and law enforcement, including counter-terrorism, in support of national security and the security of Canadians abroad;

Provide assistance to civil authorities and non- governmental partners in responding to international and domestic disasters or major emergencies; and

¹ Dr. Paul Mitchell, "Submarines and Canadian Security: Tactical Perspectives – Strategic Rationales", last modified 25 July 2013, <http://canadianmilitaryhistory.ca/submarines-and-canadian-security-tactical-perspectives-strategic-rationales-by-paul-t-mitchell/>.

² Department of National Defence, *Strong, Secure, Engaged – Canada's Defence Policy*, (Ottawa: DND Canada, 2017), 59.

Conduct search and rescue operations.³

Taking these strategic ideas into the maritime domain, the Canadian government calls for a “Blue Water Navy that possesses a balanced mix of platforms.”⁴ Under the motto of “Ready to Help, Ready to Lead, Ready to Fight”⁵ the RCN must be prepared to perform a wide set of missions. As stated in the RCN Strategic Plan 2017-2022,

these domestic and international missions include, but are not limited to, the provision of humanitarian assistance and disaster relief, conducting Search and Rescue, provision of assistance to civil authorities and law enforcement authorities for counter-terrorism and drug interdiction operations, contributing to capacity building efforts, and full combat operations to defend Canada, its national interests, partners, and allies.⁶

The following analysis will identify the missions where submarines can contribute significantly to the CAF’s and RCN’s aims. While Canada’s Defence Policy and the RCN’s Strategic Plan concentrate on the nearer future (until the mid 2020’s), the RCN has also stated its ideas and plans for the wider future until 2050.⁷ When describing its future forces, the RCN calls for agility and adaptability as key attributes to set up the RCN as a warfighting institution. Some of these attributes focus on technical and industrial features. The impact of a submarine fleet on these attributes will round off the analysis in this service paper.

3. A submarine fleet and its impact upon mission outcomes has links into many different domains. Embedded into the military world, the use of submarines is linked to the political domain, to other governmental institutions, to military industry and to the domain of research. These domains will be used to give structure to the subsequent examination of the advantages of possessing a submarine fleet. Finally, this paper assumes that Canada will not purchase nuclear propelled submarines and will focus only on conventional submarines.

DISCUSSION

Military Perspective

4. As a representative of the NATO Centre of Excellence for Confined and Shallow Waters, Cdr Frank Thiede, a former German submarine commanding officer, mentioned four classical areas of submarine operations: Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASuW), Intelligence-Surveillance-Reconnaissance (ISR) and Special

³ *Ibid.*, 17.

⁴ Department of National Defence, *Royal Canadian Navy Strategic Plan 2017-2022*, (Ottawa: DND Canada, 2015), 9.

⁵ *Ibid.*, 12.

⁶ *Ibid.*, 13.

⁷ Department of National Defence, *Leadmark 2050: Canada in a New Maritime World*, (Ottawa: DND Canada, 2015).

Operations Forces Support (SOFS).⁸ In his view, these four areas will continue to remain relevant in the future, but the main focus has changed from the “classical” side (ASW, ASuW) to ISR and SOFS.

5. ASW gained importance in the Cold War era when NATO set up capabilities to defend its strike groups and to track Soviet ballistic missile submarines. While both threats are still present, there are now more nations with ballistic missile submarines (SSBN)⁹ and the number of conventional submarines (SSK) around the globe has grown significantly. Although ASW is conducted by air, surface and sub-surface assets, submarines possess some great advantages to these operations. According to the Asian Pacific Defence Reporter (ADPR) Magazine there are two characteristics which underpin the role of submarines in ASW: endurance and lethality.¹⁰ Conventional submarines have an endurance of 30-70 days without any requirement for replenishment. In this timeframe they can conduct their task without any interruption. In comparison, ships, even with a replenishment unit, and especially air assets have significantly less time on station. Submarines use wire-guided heavy weight torpedoes against other submarines.¹¹ Compared to the light weight torpedoes and water bombs used by ships and air assets their deployment, in conjunction with submarine and torpedo sensors, is more resilient and effective than ASW munitions deployed by ships or aircraft. Finally, the decisive advantage possessed by submarines regarding ASW is the mindset of the crew. Submariners know how other submariners think and live and can effectively use this knowledge to fight against submerged adversaries.

6. These advantageous characteristics of submarines with respect to ASW also hold true in ASuW where the platforms with the longest endurance and most effective weapon possesses a decisive advantage. Additionally, the stealth characteristic employed by submarines takes effect during ASuW operations.¹² Above water units can be detected in the acoustic, the electro-optical and the electro-magnetic spectrum. Conversely, opposing surface units can detect deep dived submarines only acoustically.

7. Applying the ADPR characteristics on ISR, three of them are important and stress the advantages of submarines: stealth, endurance and freedom of movement. Compared to surface assets the stealth factor of submarines is unique and enables for operations very close to the target. In combination with the aforementioned endurance, submarines are able to collect an exceptional amount of information, for example continuous recordings, pattern of life, and close-up imagery, without being detected. Covertly and long endurance give the submarine the possibility to move freely and to get into the most

⁸ Frank Thiede, “Zukünftige Maritime Operationen – Anforderungen an die Fähigkeiten konventioneller Uboote,” last modified 20 September 2011, <https://www.globaldefence.net/technologie/zukuenftige-maritime-operationen-anforderungen-an-die-faehigkeiten-konventioneller-u-boote/>.

⁹ Shannon N. Kile and Hans M. Kristensen, “Trends in World Nuclear Forces, 2017,” *SIPRI Fact Sheets* (July 2017), https://www.sipri.org/sites/default/files/2017-06/fs_1707_wnf.pdf.

¹⁰ “The Role of Submarines in Warfare,” *Asia-Pacific Defence Reporter*, 22 December 2010.

¹¹ ATLAS Elektronik, “Seahake mod4,” last accessed 14 October 2018, <https://www.atlas-elektronik.com/solutions/naval-weapons/seahaker-mod4.html>.

¹² “The Role of Submarines in Warfare,” ...

suitable position in order to fulfil the ISR task. Using these advantages, submarines are able to complement the intelligence that is gathered by other assets such as satellites and to complete a comprehensive picture of the scenario in a much more effective manner than surface and air assets.¹³

8. In the SOFS role the characteristics of stealth, endurance and freedom of movement make submarines the most suitable tool for Special Operations Forces (SOF). Stealth, the key to success for SOF missions, is best provided by submarines. With endurance and freedom of movement submarines are able to operate deep inside opponent-controlled areas and to drop the SOF off as close as possible to their target zone. Finally, submarines can gather the latest and unfiltered information required by SOF to fulfill their mission while SOF are onboard, further enabling mission success. Surface ships and aircraft are not able to provide this level of current intelligence, particularly in conjunction with the ability to covertly deploy SOF into close proximity of their target. The cooperation between SOF and submarines in navies around the world highlights the uniqueness of this capability.

9. ASW, ASuW, ISR and SOFS require military leaders to consider a huge variety of options in the deployment of naval forces. Submarines offer commanders still more options. Announcing the presence of a submarine or the deployment of one in the vicinity of an adversary can have huge effects on the adversarial side like the withdrawal of a complete force. The opponent then must deal with the addition of not only another opponent, but a stealthy, dangerous one that requires him to concentrate numerous units in order to combat it. This gives friendly military leaders the freedom to concentrate on other important courses of action in order to achieve their aims.

10. Above and beyond the strength of submarines at sea, the existence of a submarine fleet creates more advantages from a military perspective. As a submarine nation Canada has access to NATO's submarine community. This allows for a constant exchange of information regarding the movement of all allied submarines, of tactics and procedures, and of intelligence material.

11. Recent deployments of HMCS Chicoutimi in the Pacific Ocean¹⁴ and HMCS Windsor in the Mediterranean Sea and the Atlantic Ocean¹⁵ demonstrated the capabilities of Canada's silent fleet. With regard to the CAF's and RCN's vision and missions, the previously discussed submarine capabilities answer several requirements. Cdr Coffen, a Canadian officer with a submarine background, summarizes that submarines can

¹³ Peter Briggs, "Four Reasons why we need to invest in Submarines," last modified 24 February 2016, <http://www.abc.net.au/news/2016-02-25/briggs-four-reasons-why-we-need-to-invest-in-submarines/7198384>.

¹⁴ Department of National Defence, "HMCS Chicoutimi arrives home after six-month Asia-Pacific deployment," last accessed 14 October 2018, <https://www.canada.ca/en/department-national-defence/news/2018/03/hmcs-chicoutimi-arrives-home-after-six-month-asia-pacific-deployment.html>.

¹⁵ Navaltoday.com, "Canadian Submarine HMCS Windsor returns from Mediterranean Deployment," last modified 21 June 2018, <https://navaltoday.com/2018/06/21/canadian-submarine-hmcs-windsor-returns-from-mediterranean-deployment/>.

contribute to the ideas of SSE either in front of Canadian or North American coastlines or far away from the homeland.¹⁶

Intragovernmental Perspective

12. The above-analyzed areas of operation of submarines are also relevant outside of the military hemisphere. Particularly in the roles of ISR and SOFS, submarines are very capable of contributing to Other Government Departments (OGD). Cdr Craven, an officer with a submarine background who served in the Maritime Staff in Ottawa, outlined the unique services of Canadian submarines to counter-drug and fishing operations.¹⁷ In 2009, a failed hostage release operation on the German merchant ship *Hansa Stavanger*¹⁸ led to a deep cooperation between the German Federal Police's special unit GSG 9 and the German Submarine Force and now stands as an example of the benefits of submarine involvement in hostage release operations on ships and offshore platforms.¹⁹ The stealth factor in particular makes this kind of support unique. These three types of operations cover another core mission of the CAF: "Provide assistance to civil authorities and law-enforcement."²⁰

Political Perspective

13. By arguing for a Canadian submarine force David Dunlop, a Tactical Data Coordinator with naval background who has issued several articles on Canadian procurement issues, stated that "in terms of surveillance of Canada's ocean approaches and the protection of its own sovereignty, a submarine capability is critical."²¹ In terms of sovereignty a submarine fleet gives several options to the government. The fact that Canada possess these assets and is willing to deploy them sends a strong signal to possible illegal actors within Canadian territorial waters. Next to this power projection submarines can be considered as a very capable tool to aid in enforcing the sovereignty of Canada by acting in the mentioned areas of operation.

14. Although deterrence is generally used in combination with SSBN and nuclear capabilities, SSK can also support the government in deterring adversaries. In the words of Klaus-Dieter Schwarz, deterrence means "influencing the actions of another party in order to restrain them from doing something unacceptable by presenting them the

¹⁶ K.H. Coffen, "A Submarine Replacement Project for Canada" (Master of Defence Studies, Canadian Forces College, 2012), 35-36.

¹⁷ Michael Craven, "A Rational Choice Revisited – Submarine Capability in a Transformational Era," *Canadian Military Journal* (Winter 2006-2007): 24.

¹⁸ Zeit Online, "GSG9-Kommandoaktion im letzten Moment gestoppt," last modified 06 Mai 2009, <https://www.zeit.de/online/2009/19/piraten-gsg9-gestoppt>.

¹⁹ Bundespolizei, "GSG 9," last accessed 14 October 2018, https://www.bundespolizei.de/Web/DE/05Die-Bundespolizei/04Einsatzkraefte/GSG9-neu/01-Die-GSG9/gsg9_node.html;jsessionid=47D8B3486535F44D2859CECA3ED05381.2_cid289.

²⁰ Department of National Defence, *Strong, Secure, Engaged ...*, 17.

²¹ David K. Dunlop, "Canada's Future Submarines," last accessed 14 Oct 2018, <http://www.navalreview.ca/2017/09/canadas-future-submarines/>.

prospect that you will respond with something equally unacceptable.”²² With submarines in its toolbox the Canadian government has a greater ability to respond appropriately to a large variety of adversarial actions.

15. A submarine fleet has the potential to enlarge the Canadian government’s options for response during the emergence of a conflict or critical situation. Not only can submarines collect unique information in order to realize, very early, oppositional intentions, but with this early warning, decision makers are able to use all diplomatic means in order to prevent an escalation or to prepare their own forces for an inevitable conflict.²³ Additionally, the use of a submarine in times of a tension “can exert diplomatic, political or military influence in the furtherance of national goals and interests.”²⁴ All in all, the Canadian government stands to gain a multitude of strategic level options with the active use of a capable submarine fleet, all of which complement the objectives set out in SSE.

16. Canada relies on its partnerships and alliances for security. They are the framework for Canada’s engagements around the world and they provide the necessary support to defend its vast country and huge coastal areas. This support, for example collective defence in accordance with Article 5 of the Washington treaty,²⁵ does not come free of charge. Alliances are based on contributions from all members. A modern and powerful Canadian submarine fleet represents a weighty input to all of its military alliances and should not be discounted.

17. The first step towards maintaining the RCN’s submarine fleet involves the modernization of Canada’s Victoria class boats.²⁶ This step must be followed closely by the procurement of a new submarine class in order to maintain the validity of Canada’s submarine fleet.²⁷ In the context of NATO these modernization plans will give the Canadian government the opportunity to participate in Smart Defence and to leverage the modern defence capabilities of this alliance while also demonstrating Canada’s willingness to contribute meaningfully to its alliances and own coastal defence.²⁸

Research Perspective

18. With respect to Canada’s plan to modernize²⁹ and replace³⁰ the current submarine force it is important for the RCN to keep pace with the rapidly-developing defence

²² Klaus-Dieter Schwarz, “The Future of Deterrence,” *SWP Research Paper (June 2005)*, <https://www.swp-berlin.org/en/publication/the-future-of-deterrence/>.

²³ Peter Briggs ...

²⁴ Michael Craven ..., 23.

²⁵ North Atlantic Treaty Organization, “What is NATO?” last accessed 14 October 2018, <https://www.nato.int/nato-welcome/index.html>.

²⁶ Department of National Defence, *Royal Canadian Navy Strategic Plan ...*, 15.

²⁷ Department of National Defence, *Leadmark 2050 ...*, 50.

²⁸ North Atlantic Treaty Organization, “Smart Defence,” last modified 20 February 2017, https://www.nato.int/cps/en/natohq/topics_84268.htm.

²⁹ Department of National Defence, *Royal Canadian Navy Strategic Plan ...*, 15.

³⁰ Department of National Defence, *Leadmark 2050 ...*, 50.

technology sector. In order to be in a position to negotiate and contract future services, upgrades and procurements intelligently, it is absolutely necessary to be on a par with industry. This equal level demands the feature of a smart buyer,³¹ who is able to assess industrial offers in view of operational needs. With a submarine fleet Canada keeps its personnel in the business and makes sure that they continue to work below the surface in order to gain the necessary experiences and ideas for future developments and tactics in underwater warfare. Bryan Clark, a Senior Fellow at the Center for Strategic and Budgetary Assessments, highlights this idea by demanding that “America could leverage enduring advantages such as its geography, R&D base, military culture, and operational competence to exploit new ways and means of conducting undersea warfare more rapidly than its competitors.”³²

19. Taking a view around the globe on the rising potential of emerging powers such as China and the reinvigoration of Russia’s naval power underlines the necessity for Canada to keep pace with its competitors. Peter Hayes, director of the Australian Nautilus Institute for Security and Sustainability, draws a menacing picture by describing Chinese and Russian underwater systems and weapons under development³³ by describing for example torpedoes with nuclear warheads or a huge bunch of unmanned underwater vehicles equipped with artificial intelligence in order to make decisions on their own. Considering that Hayes’ focus is on the Pacific Ocean, his picture intensifies the need for a Canadian submarine fleet if Canada wishes to be able to respond to those future threats within its own waters.

Industrial Perspective

20. The Canadian Defence Policy, the RCN’s Strategic Plan and Leadmark 2050 all demand a strong cooperation between the RCN and the Canadian military industry in order to strengthen this vital sector for Canada’s Defence. In this context Canada’s government announced the 2010 National Shipbuilding Strategy. Its aim is to “helping restore our shipyards, rebuild our marine industry and create sustainable jobs in Canada while ensuring our sovereignty and protecting our interests at home and abroad.”³⁴ The existence of today’s Canadian submarine fleet in combination with the RCN’s future plans of a replacement of the Victoria class³⁵ represent major contributions towards sustaining this industry which are explained as follows:

³¹ Australian Government Department of Defence, “Smart Buyer,” last accessed 14 October 2018, http://www.defence.gov.au/CASG/NewsMedia/DMOBulletin/smart_buyer.

³² Bryan Clark, “The Emerging Era in Undersea Warfare,” *CSBA Study (January 2015)*, <https://csbaonline.org>, 18.

³³ Peter Hayes, “Off the Beach: Underwater Warfare in the 21st Century,” *Global Asia Vol. 13 No. 1* (Spring 2018) https://www.globalasia.org/v13no1/cover/off-the-beach-underwater-warfare-in-the-21st-century_peter-hayes.

³⁴ Public Services and Procurement Canada, “About the National Shipbuilding Strategy,” last modified 11 July 2017, <http://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/mer-sea/sncn-nss/apropos-about-eng.html>.

³⁵ Department of National Defence, *Leadmark 2050* ..., 50.

a. With the current submarine fleet and its standing in-service support the RCN is currently contributing to the Shipbuilding Strategy's aim. Due to their uniqueness and their special technical requirements for operations under the surface, submarines require distinctive maintenance workshops with a highly skilled and experienced working force. Turning away from the Canadian submarine capability would eliminate this valuable service and would stand in conflict with the idea of the Shipbuilding Strategy and the RCN's mission.

b. The submarine replacement plans have great potential in empowering Canada's shipbuilding industry. Although Tom Jenkins, Special Advisor regarding the development by the Government of Canada of a Defence Procurement Strategy, stated in his report that Canada will not be able to build submarines on its own,³⁶ he mentions many minor options to strengthen the local industry by procuring a new submarine class. Those options would create more employment in the defence industry and would increase the existing working force (in-service support) in the naval industry.

CONCLUSION

21. Modern navies must possess a submarine capability to be considered viable. The unique tactical capabilities, many operational options and a significant impact at the strategic level are all excellent reasons to maintain the Canadian submarine force in order to contribute to the CAF's core mission outlined in SSE. If there is a strong political and military will to use this powerful multipurpose tool, Canada will see great benefits from possessing this high value asset.

³⁶ Tom Jenkins, *Canada First: Leveraging Defence Procurement Through Key Industrial Capabilities*, (Ottawa: Government of Canada, 2013), 37.

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