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DISTRIBUTED LETHALITY: A RE-IMAGINED CONCEPT FOR THE CANADIAN SURFACE COMBATANT

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**DISTRIBUTED LETHALITY: A RE-IMAGINED CONCEPT FOR THE
CANADIAN SURFACE COMBATANT**

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DISTRIBUTED LETHALITY: A RE-IMAGINED CONCEPT FOR THE CANADIAN SURFACE COMBATANT AIM

1. The aim of this service paper is to suggest a reframing of the intent for the development of the Canadian Surface Combatant (CSC) from a general multi-purpose surface ship, akin to the current Canadian Patrol Frigate (CPF), to an offensive warfighting capability as part of a ‘Distributed Lethality’ framework.

INTRODUCTION

2. The Canada First Defence Strategy (CFDS) was written as a guideline to enable the Canadian Forces to provide “enhanced security for Canadians at home as well as a stronger voice for Canada on the world stage”.¹ Part of the commitment included the acquisition or development of fifteen (15) new warships to replace the aging Canadian Navy fleet of *Iroquois* class destroyers and *Halifax* Class Canadian Patrol Frigates, under the auspices of the later named Canadian Surface Combatant (CSC) program. These new ships would ensure the military remained able to “monitor and defend Canadian waters and make significant contributions to international naval operations.”² Of the six (6) core missions of the CFDS, the new warships would contribute primarily to missions five and six:

- Core Mission 5: “Lead and/or conduct a major international operation for an extended period; and”
- Core Mission 6: “Deploy forces in response to crises elsewhere in the world for shorter periods.”³

¹ Department of National Defence, *Canada First Defence Strategy* (Ottawa: DND, 2008), 4

² *Ibid.*, 17

³ *Ibid.*, 3

3. *Leadmark: The Navy's Strategy for 2020* highlights that in the future uncertain operating environment the CF will “normally participate in international operations as a contributing part of a coalition” and that the emphasis will be on “interoperability with US [United States] forces.”⁴ Further to this, Canadian Naval forces must be able to influence events at a distance and enable joint operations through the maintenance of those versatile and interoperable combat capable warships.⁵ Therefore, the one certainty in the future operating environment is that Canada’s future Navy will continue to operate away from home and likely as part of a coalition. The focus of this paper will centre around one question: *What do we think that coalition construct at sea will look like?*

4. This paper will begin by analyzing the future operating environment through a discussion surrounding recent US Navy (USN) thoughts on future force employment. Specifically, it will differentiate how the US views the future Task Group (TG) construct, and highlight how this differs from the current Canadian perspective. Next, this paper will consider the proposed capabilities of the Canadian Surface Combatant. The overall purpose of this paper, however, will be to submit considerations for a change in focus on capabilities towards those that would be more akin to offensive operations, taking into account the potential move of the US Navy towards a concept of ‘Distributed Lethality.’

DISCUSSION

5. In March 2013, Captain (CAPT) Henry J. Hendrix, USN wrote a paper for the Center for a New American Security entitled ‘At What Cost a Carrier?’ It was one of a series of papers aimed at dealing with controversial issues in US defence policy arising from the evolution of an increasingly complex operating environment under the current

⁴ Department of National Defence, *Leadmark: The Navy's Strategy for 2020* (Ottawa: DND, 2001), 14

⁵ *Ibid.*, 118

financial strains the world was experiencing.⁶ CAPT Hendrix hypothesizes that “the carrier equipped with manned strike aircraft is an increasingly expensive way to deliver firepower and that carriers themselves may not be able to move close enough to targets” due to technological increases in satellite imagery and advances in long-range precision anti-ship missiles.⁷ He discounts the perceived value of a carrier strictly as a form of deterrence, citing analytical studies which posit that “persistent presence, even with low-end platforms, encourages conflict avoidance.”⁸ Therefore, taking into consideration the developing vulnerabilities of aircraft carriers in a rapidly advancing technological world, he proposes that the strike capabilities of the carrier could more effectively be carried out instead by increased numbers of surface ship combatants armed with long-range precision guided missiles such as the Tomahawk Land Attack cruise Missile (TLAM).⁹

6. Further to this, he proposes that by divesting itself of carriers, the US would be able to “invest in larger numbers of less exquisite ‘influence squadrons’ to maintain naval presence in regions of interest ... [and] provide utility across the spectrum of engagement by emphasizing payload over platforms.”¹⁰

⁶ Henry J. Hendrix, “At What Cost a Carrier?” *Disruptive Defense Papers* (Washington, DC: Center for a New American Security, 2013). Cited from About the Author: Captain Henry Hendrix is a career naval flight officer with six operational deployments in aircraft and as a member of ship’s company on large and light-amphibious aircraft carriers. Following his command at sea tour with Tactical Air Control Squadron ELEVEN, he reported to the Pentagon where he has served as a Force Structure Analyst and Strategist in the Office of the Under Secretary of Defense for Policy, the OSD Office of Net Assessment, the office of the Deputy Under Secretary of the Navy for Plans, Policy, Oversight and Integration and the OPNAV staff. He holds Masters Degrees in National Security Affairs from the Naval Postgraduate School and History from Harvard University as well as a Ph.D. in War Studies from Kings College London. He was appointed an Adjunct Associate Professor by Georgetown University where he teaches courses on Technology Cycles and Strategy at the undergraduate and graduate level. Captain Hendrix is the author of the book *Theodore Roosevelt’s Naval Diplomacy*, and has written for several professional journals. His written analysis has been recognized by the Surface Navy Association, the Marine Corps Heritage Foundation, the Naval Institute and the Navy League of the United States.

⁷ *Ibid.*, 3

⁸ *Ibid.*, 5

⁹ *Ibid.*, 10

¹⁰ *Ibid.*, 10

7. In January 2015, Vice Admiral (VADM) Thomas Rowden, USN (Commander, Naval Surface Forces), Rear Admiral (RADM) Peter Gumataotao, USN (Commander, Naval Surface Force Atlantic), and RADM Peter Fanta, USN (Director, Surface Warfare), co-authored a paper entitled ‘Distributed Lethality’ for the United States Naval Institute Proceedings magazine. In it they highlight US Chief of Naval Operations, Admiral Jonathan Greenert’s renewed focus on warfighting as being a prime tenet of the US Navy. Their paper is about a move from a ‘defensive’ Navy, centered on protecting Carrier Strike Groups (CSGs) towards an offensive force where ships are employed “in dispersed formations known as ‘hunter-killer surface action groups (SAGs).’”¹¹

8. VADM Rowden et al. state that since the end of the Cold War, the US Navy has enjoyed a monopoly on sea control, and hence has focused on force projection of power ashore via the employment of carrier air wings, and an increase in proficiency related to land-attack and maritime security operations. As the relative balance was tipped towards power projection vice a need for sea control, surface forces evolved to operate in an uncontested maritime domain, and capabilities related to anti-submarine and anti-surface warfare began to erode.¹²

9. Today however, they acknowledge (akin to what CAPT Hendrix hypothesized) that the “emergence of sophisticated sea-denial strategies has driven a need to shift to an offensive imperative to control the seas.”¹³ They propose that moving away from large, tight-knit CSGs to dispersed ‘hunter-killer SAGs’ of increased offensive surface force lethality will increase strike options and add complexity to the battlespace in which an

¹¹ Thomas Rowden, Peter Gumataotao and Peter Fanta, “Distributed Lethality”, *United States Naval Institute Proceedings*, Vol 141, Issue 1 (Jan 2015), 18

¹² Ibid., 19

¹³ Ibid., 18-19

adversary has to manoeuvre. This concept is defined as ‘Distributed Lethality.’ They qualify this concept by stating that “both parts of the definition are critical: raising the lethality of the surface force but operating it the same way sub-optimizes the investment. Operating hunter-killer SAGs without a resulting increase in offensive power creates unacceptable risk.”¹⁴ These SAGs will be geographically displaced to complicate enemy targeting, but will be networked to support complex operations even in the absence of a carrier air wing or land-based patrol aircraft.¹⁵

10. In order to be effectively employed, individual units of the SAG will require capabilities consisting of a long-range offensive surface-to-surface missile, a medium-range strike weapon, a long-range ASW weapon, a versatile main gun such as a railgun, persistent organic airborne ISR to include manned rotary wing and Unmanned Aerial Vehicles (UAVs), and an effective Command and Control (C2) network.¹⁶

11. The 2011 Canadian Navy Director General Maritime Force Development (DGMFD) *Canadian Surface Combatant Concept of Employment (CSC COE)* envisions CSC as “the core component of a globally deployable, multi-purpose, combat-capable maritime force.”¹⁷ The document acknowledges that the CSC “will be the major surface component of maritime combat power for Canada, achieving freedom of action through Sea Control.”¹⁸ The list of projected missions is parallel to the mission sets the Royal Canadian Navy undertakes today. As per the CSC COE, these would include:

- a. Multi-threat warfare;

¹⁴ Ibid., 20

¹⁵ Ibid., 21

¹⁶ Ibid., 22-23

¹⁷ Department of National Defence, Director General Maritime Force Development, *Canadian Surface Combatant Concept of Employment*, (Ottawa: DND, 2011), 5

¹⁸ Ibid., 7

- b. Support to forces ashore;
- c. Embargo operations;
- d. Maritime Interdiction Operations (MIO);
- e. Non Combatant Evacuation Operations (NEO);
- f. Counter-piracy;
- g. Counter Terrorist (CT) operations;
- h. Support to the North American Aerospace Defence Command (NORAD);
- i. Maritime domain awareness;
- j. Conduct of sovereignty patrols;
- k. Support to the Public Service and Law Enforcement Agencies (LEA);
- l. Search and Rescue (SAR);
- m. Humanitarian Assistance and Disaster Relief (HA/DR);
- n. Overseas regional engagement (diplomacy and capacity building); and
- o. Domestic community engagement.¹⁹

12. Although the CSC COE acknowledges the evolution of maritime power to include support to Joint Fires and evolving Ballistic Missile Defence (BMD),²⁰ the concept of employment follows lines analogous to the current operating environment, that of operating independently, or as part of a standard Naval Task Group (TG), such as the CSGs with which Canada has deployed over the past two (2) decades. This is contrary to the future TG envisioned under the ‘Distributed Lethality’ construct.

13. Fortunately, the 2013 Royal Canadian Navy (RCN) DGMFD *Concept for Naval Fire Support (NFS)* recognizes the importance of a “robust NFS capability that can

¹⁹ Ibid., 7-8

²⁰ Ibid., 11

quickly and effectively contribute to joint and combined operations ashore.”²¹ It highlights that the type of NFS system acquired and the associated command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) components “must be heavily weighted towards interoperability with Canada’s defence partners.”²² As to the instruments of NFS, the concept of employment speaks to the importance of a gun system that can “adequately satisfy anti-air self-defence, anti-surface engagement (including over-the-horizon engagements), and NFS engagements on fixed or mobile targets.”²³ It also stipulates that the future operating environment may require “the procurement of a longer range missile [than the current HARPOON Block II] that will allow naval forces to secure and prepare a littoral environment, as well as engage in precision strike on inland targets.”²⁴

14. Ms. Grace Jean, a contributor to *Jane’s Defense Weekly* and *Jane’s Navy International*, cited VADM Rowden from a July 2015 interview with IHS Jane’s as saying that the USN has already commissioned studies and commenced wargaming to assess the ‘Distributed Lethality’ concept, and that “increasing the ships’ lethality would not necessarily entail a major acquisition effort.”²⁵

15. What the USN proposes is to either modify existing weapons systems, or utilize development projects currently underway in new, innovative attempts to adapt other weapons systems. In essence, “add a little bit of technology to each weapon – whether that’s hardware, software, whether that’s the platform or the weapon, or maybe just a

²¹ Department of National Defence, Director General Maritime Force Development, *Concept for Naval Fire Support (NFS)*, (Ottawa: DND, 2013), 9

²² *Ibid.*, 11

²³ *Ibid.*, 15

²⁴ *Ibid.*, 15

²⁵ Grace Jean, “US Navy Pursues Distributed Lethality Concept in Earnest”, *Jane’s Navy International*, Vol 120, Issue 6, (01 Aug 2015)

different way of doing things, a different way of gluing together the sensors and weapons we have.”²⁶ One example of this would be to modify the existing Tomahawk missile for use as a surface-to-surface weapon. This would extend the range of the normal surface-to-surface missiles the Navy currently employs and offer the possibility of having a dual-use weapon onboard for strike missions. By taking advantage of the prevalence of vertical launch systems already within the US Fleet, the USN could enable warships to subscribe to an enhanced, layered engagement approach to surface warfare, increasing the range of attack, and creating increased battlespace. Another example would be to incorporate some of the guided munition technology from the development of the Hypervelocity Projectile for the Electromagnetic Railgun into new ammunition types for the 57mm gun, which is currently employed on the USN’s Littoral Combat Ship (LCS); this would increase the accuracy of that weapon system.²⁷

16. The above modification to the Tomahawk would satisfy the ‘Distributed Lethality’ requirement for a long-range surface-to-surface missile. Similarly, though not optimal, modifications to the ammunition for the 57mm gun satisfy the requirement for a main gun that enjoys flexibility of use, anti-air defence and limited NFS. What would still be required on the weapon side are a medium-range strike weapon and a long-range ASW weapon. Although the USN has not identified a probable medium-range strike weapon, the article by VADM Rowden et al. in the January 2015 issue of *United States Naval*

²⁶ Megan Eckstein, “A Year Into Distributed Lethality, Navy Nears Fielding Improved Weapons, Deploying Surface Action Group”, USNI News, 13 Jan 16, <http://news.usni.org/2016/01/13/a-year-into-distributed-lethality-navy-nears-fielding-improved-weapons-deploying-surface-action-group>

²⁷ Ibid.

Institute Proceedings does mention that the intention would be for this weapon to fit into existing Vertical Launch Systems (VLS).²⁸

17. Similar to the issues surrounding surface-to-surface missiles, VADM Rowden goes on to state that a potential solution to the long-range ASW weapon would be to both capitalize on the use of manned organic helicopters (as is currently the case) and to re-look at the employment of systems similar to the legacy Anti-Submarine Rocket Assisted Torpedo (ASROC), which could be fitted into either the Surface Vessel Torpedo Tube (SVTT) or VLS.²⁹

18. These weapon systems would be complemented by organic shipborne UAVs, capable of launch-recovery, and a robust, continuously evolving C2 network.

CONCLUSION/RECOMMENDATION

19. *Seapower* magazine has reported that the Government of Canada intends to select the ship design firm and the systems integrator firm for the CSC in 2017. The intent would then be to produce three (3) destroyer variants first to replace the RCN's now defunct *Iroquois* Class destroyers, followed by the remaining twelve (12) *Halifax* Class frigate replacements.³⁰

20. The *Canadian Military Journal* reported that while the Statement of Requirements (SOR) is unknown, the intent for the CSC program will remain two-fold: first, to blend the requirements for the replacement of two vessels into a single platform (as mentioned above), and second, to “maximize commonality between the variants to

²⁸ Thomas Rowden, Peter Gumataotao and Peter Fanta, “Distributed Lethality”, *United States Naval Institute Proceedings*, Vol 141, Issue 1, (Jan 2015), 22

²⁹ *Ibid.*, 23

³⁰ Anonymous, “Canadian Surface Combatant to be Selected in 2017”, *Sea Power*, Vol 58, Issue 6 (Jul 2015), 64

achieve economies of scale during the build phase as well as operations/maintenance savings over the long term.”³¹

21. Taking these requirements into account, coupled with the oft-stated intention to remain capable for future employment in coalition Task Groups, it becomes clear that the design for the CSC should endeavor to include the flexibility for future integration into a ‘hunter-killer SAG’ as envisioned by VADM Rowden. This would involve the inclusion of (in addition to the standard manned helicopters): VLS launchers able to accommodate a range of weapons from Tomahawk to ASROC torpedoes; a flexible gun system, either akin to the USN railgun or at least a precision-strike modified 57mm or larger gun; UAVs that are launch/recover capable.

22. What is more important though is the need to adopt the philosophy of the ‘hunter-killer SAG’. If the USN does move towards this concept and away from traditional TG models such as CSGs, the RCN needs to be able to adapt or will likely be pushed to the side. In the VADM Rowden model, units of the SAG are not just screening ships for another purpose, but are an integral part of the battle formation.

23. VADM Rowden acknowledges that this will be a cultural shift for the Navy, but that by increasing the lethality of each ship, and employing these SAGs across a dispersed battlespace, it will force the adversary to “think differently about how to attack our forces by giving them more targets to contend with.” This shift in their defence will result in “improving our operational advantage to exploit adversary forces.”³²

³¹ David Rudd, “Off-the-Shelf or New Design? Considerations for the Canadian Surface Combatant Program”, *Canadian Military Journal*, Vol 16, Issue 1 (Winter 2015), 5

³² Michael Fabey, “Distributed Lethality Good Fit for Asia Pacific Navy Commander Says”, *Aerospace Daily & Defense Report*, Vol 251, Issue 16 (2015), 4

24. Therefore, the overall recommendation of this paper is that as the capabilities of the Canadian Surface Combatant are being examined, the RCN should closely follow developments in the employment of the concept of ‘Distributed Lethality’ by the USN. In following these developments and in applying the new concepts and technology to the CSC as it rolls out, the RCN will ensure that it remains ready to integrate into these new coalition Task Groups – a viable means of influencing events at a distance and enabling joint operations.

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