



The Cost of Canada's Surface Combatants: The PBO's 2021 Update and Options Analysis

Comments and Considerations from the Naval Association of Canada

March 2021

In early February, the Naval Association of Canada (NAC) released an in-depth research paper outlining the inherent complexities of costing and comparing shipbuilding projects. The focus of the paper was the Canadian Surface Combatant (CSC) Project, which is now garnering considerable attention in the wake of the recent Parliamentary Budget Officer (PBO) Report.¹ The NAC's aim was to highlight both the broader strategic value and economic advantages of domestic shipbuilding and the challenges of comparing different warship designs. In doing so, the intent was to offer a more holistic understanding of Canada's approach to shipbuilding and the CSC Project.

Now that the PBO has released cost estimates and comparisons between the CSC and other warship designs, the NAC would like to comment on certain assumptions and conclusions within that Report. As with our past work, the intent is not to criticize the

PBO, who has produced a realistic and sophisticated cost analysis, but rather to re-emphasise the layers of complexity and uncertainty in shipbuilding and to provide context to assist readers in their evaluation of the Report.

The PBO Report - Overview

The PBO's Report on the CSC was prepared in response to a request from the House of Commons Standing Committee on Government Operations and Estimates. The assigned task was to examine the cost of the existing CSC Project to replace both the current fleet of 12 Halifax-class frigates and three Iroquois-class destroyers with a new fleet of 15 multi-purpose warships, based on the BAE Global Combat Ship (GCS) design² and to cost compare two other designs – the US Navy Constellation-class frigate, based on the FREMM European

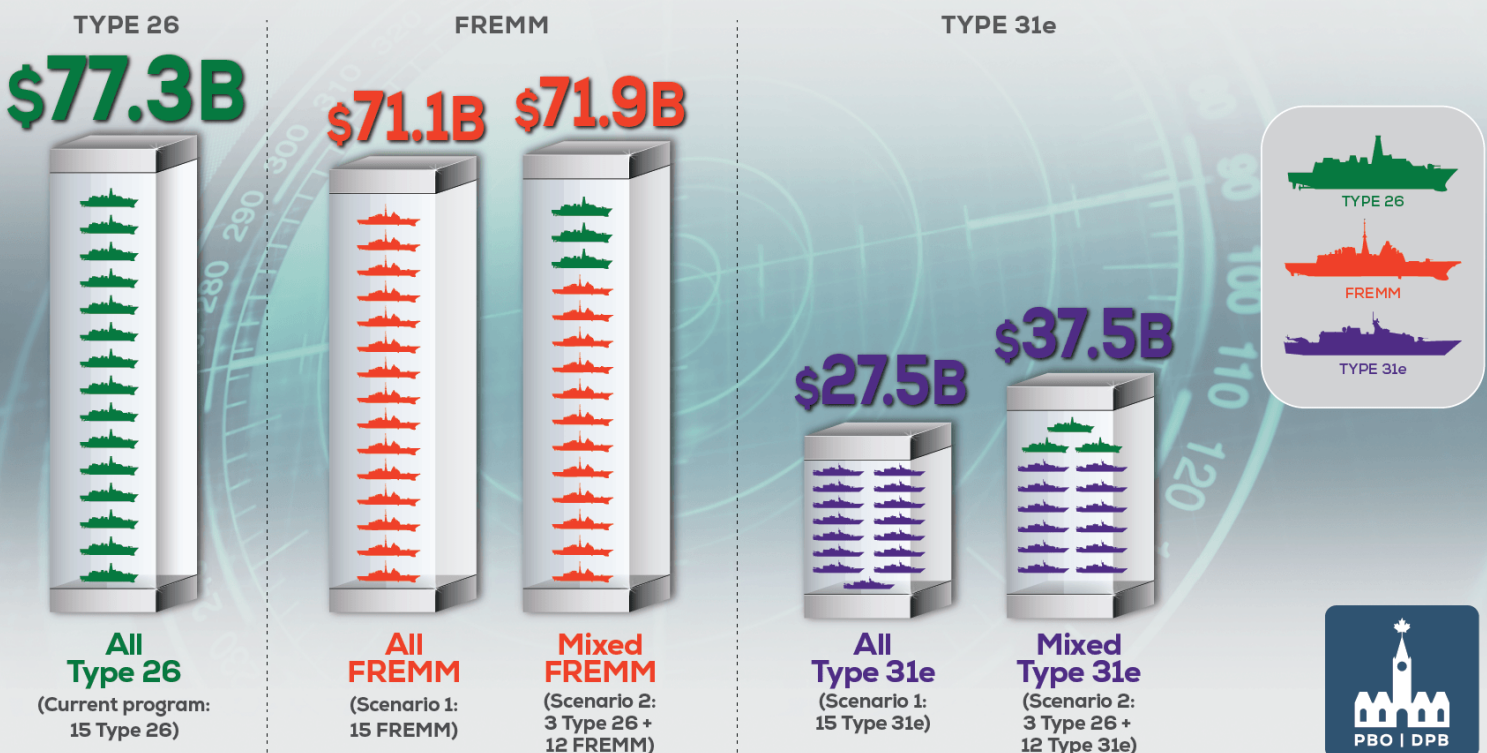
multi-mission frigate, and the British Type 31e general-purpose frigate based on the Danish Iver Huitfeldt design. While such comparisons may appear appropriate to the layman, it is the NAC’s opinion that they are of marginal value to the overall discussion. The CSC Project is already too far along in the development process to consider an abrupt halt and a shift to a new platform. The significant costs that have already been incurred, combined with the additional costs of contract cancellations, and the major disruption to the project schedule would be too severe. Canada does not need a repeat of the Maritime Helicopter Project.

It should be noted that while a capabilities comparison was purposefully excluded from the PBO’s work, the report was clear that it recognized the “differences in capabilities” between the various ship designs.³ This omission is critical to understanding the complexity of the comparisons and evaluating the Report. In order to be relevant in international affairs, Canada needs a versatile fleet of high-end naval combatants that are capable of “maritime security, counter-terrorism and

counterpiracy operations, escort duties, and presence missions.”⁴ While the CSC will also need to undertake ‘low-end’ constabulary missions, the rationale underpinning the Navy itself is its ability to conduct full spectrum maritime operations, which include the ability to engage in combat operations.

The PBO’s CSC costing estimate, which is an update on that undertaken in 2019,⁵ indicates a \$7.5 billion increase in the Project’s overall budget, owing largely to updates in the ship’s specifications and timelines. While the PBO’s costing analysis appears both thorough and fair, the CSC build complexity and requirements reconciliation effort have been underestimated. Canada's history working with the CSC Project has shown how much time and cost is involved making alterations to even a cutting-edge design. Additionally, the idea that the timeframe for the selection of a new design could be shortened is simply unrealistic. Canada lacks the necessary staff to undertake that work on a condensed schedule, while simultaneously continuing the ongoing CSC Project activities. If the Department of National Defence (DND) had the capacity to complete that work faster,

CANADIAN SURFACE COMBATANT (CSC) PROJECT: THE COST OF TYPE 26 AND ALTERNATE DESIGNS



it would have done so on the current Type 26 design modifications.

PBO Scenario One - Recompete and Replace the T26 Design

Following the cost analyses depicted above, the PBO Report then presents two scenarios, each with two options, for consideration. The first scenario entails stopping the design and procurement activity on the current Type 26 design chosen by Canada in 2019 and initiating a new competitive procurement to build either the US FREMM or the Type 31e. Given that the Type 26 design has already been deemed the preferred solution, most closely aligned with Canada's requirements, this raises serious questions. How the Government of Canada, which values a fair, open, and transparent process in all defence procurements, would endeavour to preclude the Type 26 design from a subsequent competition is left unstated in the PBO Report. Certainly, such action would present a real avenue for legal challenge by the current industrial team and create a foundation for successful litigation, with additional costs to all parties.

In the NAC's view, the switch from the Type 26 to any new ship design would present significant risk for negligible potential returns. While the US FREMM is a close comparison to the Type 26/CSC design in that it is a general-purpose frigate capable of conducting anti-air, anti-surface, and anti-submarine operations, there would be only a marginal savings in switching to that design. Those savings were also estimated by the PBO without considering the demanding contractual terms and conditions imposed on the Type 26 team that proposed this design solution. These terms, imposed by Canada, carry additional costs associated with the commitments made by the

industrial team to achieve Canada's stringent requirements in support of the Industrial and Technological Benefits (ITB) and Value Proposition (VP) policy. None of the costs associated with these contractual commitments appear to have been considered in the PBO's cost comparisons.

A fleet of 15 US FREMM warships is costed by the PBO at \$71.1 billion – roughly 9% less expensive than 15 Type 26 and well within the PBO's self-defined 20% margin of error.⁶ However, a switch to the US FREMM would result in the loss of four or more years of detailed options analysis and project

definition work and would stretch Canada's fleet replacement program even further into the future. Moreover, such a change would undoubtedly tax the Halifax-class frigates to the limit, and perhaps leave Canada without a functioning navy as those ships become obsolete before being replaced.

The PBO explicitly excludes any costs arising from an interruption of production at Irving Shipbuilding and among its subcontractors.⁷ Yet any such delay would leave the shipyard and its suppliers with a multi-year gap in orders. The result would be the disbanding of a workforce which has been assembled and trained over many years and at considerable cost. It would also pose significant new risks associated with the inability to resume production efficiently after that workforce dispersed.

While opting to switch to the Type 31e design at a cost of \$27.5 billion for a fleet of 15 (which is roughly 65% cheaper than the current CSC Project) may have allure at a superficial level, the assumption that the Type 31e would be a suitable replacement is deeply flawed. First, The PBO's cost estimates for that ship are not from the United Kingdom but are based on the Danish build of the Iver Huitfeldt class

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frigate, which was a largely commercial design by Odense Maritime Technology (OMT). Not only is the price comparison not founded on the unique Canadian requirements, including the CSC contractual terms and conditions, but in the previous competitive solicitation OMT, despite qualifying as a CSC Short-Listed Respondent, chose not to offer this design solution as a Lead Warship Designer. Assuming a renewed interest by another commercial firm to propose the Type 31e to Canada requires a significant leap of faith.

In terms of combat capability, the PBO notes that the Type 31e possesses “more modest capabilities.” This a profound understatement. Indeed, this class of ship is not only less capable – but likely *incapable* of performing many of the tasks that are required of the CSC. A significant hull redesign would have to be undertaken to accommodate the larger CSC crew size and other survivability requirements like damage control systems, gas-tight citadels, and fitted degaussing coils. Designed as a ‘light frigate’ or even a well armed patrol ship, the Type 31e does not have significant weapons capacity built into the design and was never intended to carry the full suite of sensors and weapons that the RCN has long identified as a basic requirement. The projected crew size (of around 100) is also much smaller than the current projected CSC crew of 204. That smaller complement will leave the ship unable to undertake continuous operations – an essential requirement in sustained combat situations. Virtually all Type 31e sensor and weapon systems would have to be replaced, and new systems sourced, evaluated and integrated into the combat system. Unlike the Type 26 and US FREMM designs, this lighter warship would have to be radically augmented to meet Canadian requirements, or the requirements would have to be completely re-written to accommodate a less capable platform.

The reliability of the Type 31e costing is also somewhat suspect. The Iver Huitfeldt class was not actually built in Denmark, but rather was constructed in blocks in Estonia and Lithuania, and then transported to Denmark for assembly and fit out of

the modules. In the build process the Danish employed their StanFlex system,⁸ which allows for change-out of modular systems and separates the cost of components (weapons and sensor packages) from the overall cost estimates of the ship. In fitting out the ships the Danes also reused older weapons from other ships. This is significant, as the combat systems of a modern warship are typically the most expensive part of the total ship package and they are also the primary driver of cost escalation. In essence, the Iver Huitfeldt class was built with relatively cheap labour using a fitted for (but not with) approach to weapons and sensors. Hence the construction and the associated costs are not comparable to any other purpose-built warship.

The task of securing bids to provide a US FREMM or Type 31e replacement is also by no means certain. Canada's CSC Request for Proposals in 2016 qualified only three bidders – in part because industry did not trust Canada to be a reliable customer. Changing tack at this point and after so many years and so much investment by previous bidders would be hard to overcome and could damage Canada’s reputation further. Which firm would invest the millions of dollars needed to prepare the bid that would offer the Type 31e or a US FREMM?

The Mixed Fleet Scenarios

The PBO’s second scenario suggests switching to a mixed fleet of Type 26 and US FREMM or Type 31e warships. In addition to all of the concerns outlined above, in this scenario the Navy would be forced to continue the redesign process on the existing CSC Project while undertaking an entirely new set of modifications. In the case of the CSC Project, most of this work is already being done, not by DND, but by engineers at Irving Shipbuilding. With DND and industry running at capacity, sourcing the expertise for the second team, required to progress this work on a second design, would be a significant challenge – likely leading to additional cost inflation and delay. In the Naval Association’s opinion, the possibility of achieving a satisfactory outcome in four

years as the PBO has suggested, is extremely remote.

Additionally, switching to a second design as part of a mixed fleet would lead to missed opportunities for efficiencies and cost savings. Shipyards enjoy a learning curve as they progress with a building program.⁹ Typically over time, efficiencies improve, and costs go down. A hybrid fleet would reset that learning curve after completion of Type 26 design hull number three before the switch to a US FREMM or Type 31e design.

A mixed fleet would also require DND to support two separate classes of major combatants. This would create added administrative, logistical, and maintenance burdens and limit the possibility of cost savings by buying in bulk. The mixed fleet approach would also create longer-term challenges in terms of crewing and training inefficiencies for operators and engineers. Operating two classes of ships would necessitate different training requirements and ashore support infrastructure.¹⁰ Initially the CSC Project envisioned a mixed fleet of two different variants (Task Group Command/Air Defence and General Purpose). However, the RCN dismissed this approach for precisely these reasons.

Conclusion

Canada is a maritime nation, dependant upon the free flow of goods across the world's seas and the security provided by our maritime alliances. All Canadians should recognise that the Canadian Surface Combatant ships, when they enter service, will be making a significant contribution to Canada's defence and security, by enhancing global stability, advancing Canadian values and interests, and helping to ensure our economic prosperity for the next 40 years. The CSC Project is the most expensive government acquisition in this country's history. Despite the cost, we must maintain a combat-capable globally deployable navy.

From an economic perspective, significant industrial disruption would result from the

considerable delay caused by switching to a different design. The already significant sunk costs accrued thus far, compounded by a delay to the project of four or more years, would result in little if any real benefits. Moreover, all aspects of Canada's terms and conditions including the ITB/VP policy, and the significant legal implications, would all have to be factored into such a bold move. In the case of the US FREMM design only marginal cost savings would be achieved. Similarly, a switch to a fleet of Type 31e warships would be strategically ill-advised in that it would leave Canada with a navy incapable of performing most of its critical combat functions.

Since the PBO Report was released on 24 February there has been a litany of commentary from the media and various "experts" in this domain regarding the supposedly upward spiralling cost of the CSC Project. In the NAC's opinion this could have been avoided if DND had been forthright in explaining the circumstances, context, and validity of its initial costing of the project and had communicated to all concerned more information on the status of the project as it progressed.

In conclusion, while the Naval Association congratulates the PBO for its exemplary work, we have serious reservations regarding the scenarios and potential options presented to Government. While cost is important, so too is capability. We are pleased to be able to contribute this additional layer of operational and strategic context and add some additional clarity to this most important investment by Canada.

Notes

¹ Parliamentary Budget Office, “The Cost of Canada's Surface Combatants: 2021 Update and Options Analysis,” (2021).

² In the UK the Global Combat Ship is known as the Type 26 frigate

³ Parliamentary Budget Office, “2021 Update,” 1.

⁴ Forecast International, “Warship Forecast: Type 31,” (February 2021), 3.

⁵ Parliamentary Budget Office, “The Cost of Canada’s Surface Combatants: 2019 Update” (2019).

⁶ Parliamentary Budget Office, “2021 Update”

⁷ Ibid, 11.

⁸ Steve Wills, “LCS Versus the Danish Strawman,” Centre for International Maritime Security (February 19, 2015).

⁹ Eric Lerhe, “Fleet Replacement and the ‘Build at Home’ Premium,” Vimy Papers (Conference of Defence Associations, 2016), 10-11.

¹⁰ Christopher Nucci, “The Future Canadian Surface Combatant,” *Proceedings* 146/11/1,413 (November 2020).

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