

## FEATURE ARTICLE

# The Canadian Surface Combatant – Starting a New Conversation on Canada’s Major Warship Replacement Project

By Cdr Andrew Sargeant

Ship procurement has come a long way since the days of the Battle of the Atlantic. Between 1939 and 1945, when the Royal Canadian Navy arguably came of age, shipyards throughout England, the Maritimes and Quebec threw themselves into building small corvettes that had the range and armament to protect Allied convoys facing a deadly U-boat threat. The corvette’s simple “whaler” design meant they could be manufactured quickly and cheaply in smaller shipyards, and by war’s end, hundreds of these ships had been produced, of which 123 served in the RCN, and 10 were lost.

In this, the 75<sup>th</sup> anniversary of the end of the Battle of the Atlantic, it seems fitting that the principal effort to recapitalize the RCN’s fleet is truly taking shape. The Canadian Surface Combatant (CSC) Project, currently in project definition, is a highly complex procurement that will deliver one of the most capable warships of any navy. The platform, based on the BAE Systems Type 26 design, will house a bespoke Canadian combat system, allowing the ship to meet a broad range of threats, and carry out the mandate of the RCN. Not only is the CSC Project the flagship effort of the RCN’s fleet recapitalization, but with an estimated cost of \$56-60 billion for 15 modern

warships, it is noteworthy for being the largest, most complex procurement ever undertaken by the Government of Canada.

This is obviously a huge undertaking for the RCN’s technical support community, and hugely exciting for the sailors who will eventually take these ships to sea, and for the teams who will be supporting them from ashore. The scope and complexity associated with delivering the CSC is orders of magnitude greater than anything we’ve experienced before in Canada, including the recent HCM/FELEX frigate update project. Executing a combat system mid-life upgrade in the 25-year-old frigate platforms was no small feat, and will allow the *Halifax* class to carry the load until CSC arrives, but the scope of CSC and the impact it will have on the RCN enterprise will change the very way we do business. It is safe to say that the changes will be felt across the RCN, Assistant Deputy Minister (Materiel), the broader Canadian Armed Forces, and the Department of National Defence.

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Image courtesy Lockheed Martin Canada

With this in mind, we at the CSC Project would like to start a new conversation about what this all means for the Naval Technical support community, including the many stakeholders who are contributing to the effort as part of the wider naval materiel enterprise. A series of articles has been proposed to the *Maritime Engineering Journal* on a range of CSC topics, of which this article is the introduction. We hope the series will be of interest to our professional community, promote awareness, generate dialogue, and even attract ideas that might aid in finding smart solutions to challenging problems. It is not an understatement to say that CSC will transform the way we deliver and manage materiel and technology in the years ahead, and that the engagement of the broader Naval Technical community will be key to meeting the future demand.

Subsequent “CSC Update” articles will provide the latest information on the project, along with discussion on specific themes that we hope allow the community to explore subjects that are particularly novel and challenging. Some articles will be more technical in nature, but they will be accessible and relevant to a broad audience. The following topics are the likely ones we will be covering, although not necessarily in this order:

**CSC Design:** CSC is based on the BAE Systems Type 26 design, adapted to Canada’s needs. While this offers a relatively mature platform design, by contrast, the combat system will be designed from the ground up. Even when we are ready to cut steel, the design work will continue, particularly on the combat system. How the ship is designed and built, and what impact the Type 26’s zonal design approach will have on project milestones and build schedules will be the basis for an interesting discussion.

**CSC Combat System:** The CSC combat system is being designed around the Aegis Fire Control Loop and SPY-7 AESA 3D radar, and will include collaborative engagement capability and solid-state illuminators, all controlled by an upgraded Canadian CMS 330 combat management system. The ship will carry a 127-mm gun, and a 32-cell vertical launch system capable of handling Standard and Tomahawk missiles. When it is complete, the overall configuration will produce one of the most capable combat systems in the world. We will examine the technical and programmatic challenges of integrating a wide range of complex systems obtained from Canadian and international defence suppliers, including significant procurements through US Government Foreign Military Sales.

**Land-Based Test Capability:** Combat systems of this complexity require exhaustive testing to ensure they are fit for purpose and safe to operate. The old days of testing a combat system on board ship, as was done to a great degree during the introduction of the *Halifax* class and during the HCM/FELEX modernization, is no longer viable. The magnitude of the testing program is such that dedicated land-based test facilities are essential to designing, integrating, and certifying the combat system, not just for ship acquisition, but through life. Land-based testing is a strategic capability that will necessarily modernize how we do business for Canada’s Navy.

**Design for Supportability:** We will look at many aspects of this, such as: How do we know that the CSC will be affordable when in-service? Which decisions made during project definition will have far-reaching impacts downstream on the supportability of the class? What are the challenges associated with buying a platform designed to certain proprietary rules and industry standards, building an all-new combat system to potentially different rules and standards, and developing a support solution that can be handed over to the RCN and DGMEPM?

**Integrated Data Environment:** A Navy-wide IDE is a strategic imperative for the RCN, without which future ships would be unsupportable. We will look at how the CSC IDE fits into this model, and how concepts such as the “digital ship” and a “common source database” relate to the IDE. Will sailors maintaining equipment have computer tablets connected to a cloud solution? The IDE is a very challenging space that we have to get right.

**CSC Training:** What will the CSC crewing model look like? How many people and of which trades? Will the RCN be creating new trades or retiring existing ones? Once all that is decided, how will we train our crews? How do we balance advances in technology with time-tested best practices? How do our allies who are building similar ships do their training? Will we be sending RCN sailors to sea on USN Aegis ships? All great questions, and ones that the project team is hard at work on answering right now.

**Infrastructure Projects:** Aside from land-based test facilities, what other infrastructure projects are being driven by CSC? What is a secure training facility? Will there be one on each coast? Will the new ammunition intended for CSC require significant upgrades to the ammunition depots at CFAD Bedford and CFAD Rocky Point? Do the jetties and ranges need upgrading as well? A ship is nothing without the infrastructure to sustain it.

**Advances in Supply Chain Management and Technology:** Significant progress has been made in this area even since the HCM/FELEX days. What is supply chain assurance, and how will it impact CSC in terms of acquisition and in-service support? What are the cybersecurity concerns? Will the warehouses of the future look like Amazon? Will automatic identification technology be implemented, and if so, how? We will tell you how the RCN's best forward-thinkers are on top of these questions as well.

**CSC In-Service Support:** How do we link the supportability solution, delivered by the contractor, to the ISS solution that will be competed for separately? We will update everyone on where we are in the Sustainment Business Case Analysis process, and lay out the challenges and lessons learned in terms of transitioning to in-service.

**International Collaboration:** The Royal Navy is building the Type 26, the Royal Australian Navy is building the *Hunter* class based on the Type 26 design and incorporating the Aegis Fire Control Loop – so, how are these ships similar, and how are they different? What are the opportunities for collaboration with our allies as we all recapitalize our fleets with a similar platform and on similar

schedules? We expect to offer a wide-ranging assessment of the challenges and advantages facing us as we make CSC truly one of Canada's own.

There is no question that the Canadian Surface Combatant will change the way we do business, both in terms of operations and sustainment. Over the next several decades, the effort to deliver CSC will likely touch most everyone in the naval technical community. And while the atmosphere is vastly different from the dark days when Canada urgently needed our shipyards to crank out small escort vessels to join the Battle of the Atlantic, the opportunity to engage in productive discussion, and to share creative ideas surrounding complex (and sometimes urgent) problems, lies before us once again. We hope these articles will help to keep the conversation going.



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## The *Maritime Engineering Journal* on Canada.ca — keeping us all in touch during these challenging times

While Canada and the entire world battle to defeat the common enemy COVID-19, the *Maritime Engineering Journal* is still accessible, even to those self-isolating at home.

As we announced in our previous issue (MEJ 92), our management team and the people at RCN Public Affairs have worked closely together to present the *Journal* as a fully accessible PDF on an external facing page at: <https://www.canada.ca/en/department-national-defence/corporate/reports-publications/maritime-engineering-journal.html>

Having the *Journal* available as a fully accessible PDF on the **Canada.ca** website marks a great step forward in ensuring we reach as many people as possible in a format

they prefer. While we do not currently have plans to re-code our entire 38-year back catalogue that is available online through the kind cooperation of the all-volunteer Canadian Naval Technical History Association (<http://www.cntha.ca/publications/m-e-j/>), every effort will be made to keep the *Journal* in step with the formatting requirements of our readers.

Comments, enquiries and offers to write for the *Maritime Engineering Journal* can be sent to **MEJ.Submissions@gmail.com**

