

THE CANADIAN SURFACE COMBATANT



More than Just a Ship

With the release of Canada's defence policy *Strong, Secure, Engaged* in 2017, the Government of Canada signaled its commitment to renewing the Royal Canadian Navy (RCN) fleet.

As part of an effort to deliver a Blue Water Navy built around the ability to sustain two naval task groups of up to four combatants and a joint support ship, supplemented when warranted by a submarine and maritime air assets, the government committed to the acquisition of 15 Canadian Surface Combatants (CSC).

The effort to procure these vessels represents the centrepiece of the National Shipbuilding Strategy – the largest procurement in Canadian history – and certainly one of its most complex, spanning over three decades

Lockheed Martin Canada, the successful bidder in a lengthy but fair, open and transparent bid process, proposed a CSC concept design based on the United Kingdom's (UK) Type-26 Global Combat Ship, currently under construction. With this selection, Canada joins the UK and Australia who are leveraging the Type-26 Global Combat Ship design into their future fleets.

The CSC is Canada's next generation warship, which will eventually replace both the recently retired Iroquois-class and today's modernized Halifax-class. Capabilities from both classes will be modernized and future-proofed to ensure not only that systems stay relevant for years to come but more importantly, that tomorrow's sailors have the equipment they need when sent into harm's way. It forms part of a broad vision of defence capabilities that will serve Canada's defence interests well into the latter half of the century.

A Warship at its Core

At its core, the CSC is being designed to be combat capable through the marriage of high-tech equipment and highly trained RCN sailors - able to conduct air, surface and sub-surface warfare missions simultaneously. The crews will be trained and organized to be capable of conducting warfare operations 24/7 and to both fight the ship and respond to any damage sustained simultaneously.

Survivability, a key principle that shaped CSC requirements from the outset, refers to the ability to protect the crew onboard, maintain combat effectiveness under fire, and bring our sailors home safely on completion of the mission. This principle is reflected in ship requirements that include the military design standards for critical shipboard systems, levels of protection from blast and fragmentation, reduced signatures, a battle damage control system and, of course, the full suite of sensors and weapons the ship carries to defeat threats.

The Operational Capability of CSC, or its ability to deliver credible and relevant effect, was also top of mind to ensure that the ship could deliver on the mission set outlined in Canada's defence policy *Strong, Secure, Engaged*.

The design and capability fit aims to deliver a highly versatile ship that is multi-role in nature, and that affords the greatest range of capability. This outcome that translates directly into agility and responsiveness for the RCN, including re-rolling a deployed ship from one mission to another, without returning to port.

The ship will be able to perform a broad range of missions with North American Aerospace Defence Command (NORAD), 5-Eyes nations, NATO, coalition partners, and here in Canada with other government departments and agencies.

CSC will have decisive combat power for operations at sea, and in support of joint-force operations ashore. The versatility of the design will also ensure the RCN is well enabled to support missions for counter-piracy, counter-terrorism, intelligence and surveillance, interdiction and embargo operations, as well as provide support for humanitarian assistance, Search and Rescue, and law/sovereignty enforcement.

The Ship's Capability Suite includes:



A Node in a System of Systems

More broadly speaking, the CSC will also serve as a node in a broader system of systems, all of which are geared to ensuring that Canada is strong at home, secure in North America and engaged in the world. This system includes space-based assets, intelligence networks, advanced ISR collection platforms, and shore-based command and control facilities.

As part of this approach, the RCN will also take interoperability to the next level, enabling systems integration both with other Canadian Armed Forces capabilities and our closest allies.

Designed with a communications and information systems architecture that will enable it to share significant amounts of data, it will contribute to a modernized North American Aerospace Defence Command (NORAD), it will also and better enable the RCN to leverage and support its closest allies on operations abroad.

With its sensor-netting capability which is also employed in the United States and Royal Australian navies, the CSC will have a significantly greater ability to defend itself against highly sophisticated threats.

Finally, the ship will be digitally integrated with the RCN/CAF/DND enterprise ashore, in keeping with the RCN's Digital Navy strategy. It is being carefully designed from the outset with digital requirements in mind, with a view to leveraging new technologies in maintenance and materiel management, supply chain management, logistics, training, operational support, as well as operations.

A Workplace and Home for Tomorrow's Sailors



Ships are only as good as the sailors who sail them and going to sea has always involved some level of hardship, whether from the effects of the sea, the lack of privacy or simply the separation from family and loved ones.

In keeping with an intent to ensure the Navy affords a safe, welcoming and inclusive workplace to all its members, the RCN is looking at the hardships of going to sea and aiming to lighten them in the CSC.

Over the past several months a small team, comprised mostly of junior-level sailors, looked at the CSC design through a habitability lens and provided advice on those areas that sailors felt were most important to them.

The team surveyed close to 3,000 members of the RCN and looked at everything from privacy, personal storage, sleeping quarters, mixed messing, mess occupancy, heads and wash-places, laundry facilities, digital connectivity, fitness facilities, recreation lounges and dining.

The three most significant priorities highlighted were in the areas of privacy, the ability to digitally connect with families ashore and improved fitness facilities. The RCN is now working to see how this feedback might be incorporated into the design of CSC, to produce a ship that can better accommodate tomorrow's sailors and ensure that we remain committed to *People First, Mission Always*.

A Significant Opportunity for Canadian Industry

What lies ahead for a world-class industry team, led by Irving Shipbuilding Incorporated, Lockheed Martin Canada and BAE Systems, truly represents an immense opportunity. It all begins with ensuring the best equipment and right level of integration to enable and protect sailors in the future, so they can deliver on their mission.

Next is the opportunity that comes within each line of effort related to the overall program: naval design, systems integration, shipbuilding, training development, and shore-based infrastructure.

In each area, industry partners have a chance to adapt world-leading best practices, introduce new innovative approaches in their respective areas and leverage the best in modern technologies to make value-chain improvements.

For example, the RCN is already involved with the CSC industry team in using a model-based systems engineering approach that will establish the foundation for the eventual creation of a digital twin of the ship, as well as a baseline digital thread that will facilitate the Navy's ability to capitalize on a variety of digital technologies in the future.

The last area of opportunity lies in capitalizing on the benefits that come with three nations all building a surface combatant using the same baseline design.

Examples include pursuing supply chain economies of scale, cooperating on design and engineering packages, sharing lessons learned in design and build practices, and collaborating on the development of training products.

These areas of opportunity were spurred by Canada's National Shipbuilding Strategy, which aims to not only deliver Canada's Navy and Coast Guard the ships they need, but also to create a sustainable marine sector in Canada, and contribute economic benefits and highly skilled jobs to Canada's economy.

Conclusion

The CSC is more than just a ship – it represents a national endeavour to safeguard Canada's defence needs.

It is being designed from the keel up to be multi-purpose in its capabilities, affording Canada the ability to deploy it across a broad spectrum of mission sets, and agility to adapt to a new mission, in hours not days or weeks.

It is a significant component in a much broader system of systems, where interoperability is being elevated to integration, and digital technologies and data are leveraged as capabilities.

It offers a floating environment that balances hard steel and high tech against the habitability needs and desires of today's young sailors – a home away from home.

And finally, it offers a tremendous opportunity for Canadian industry to take on a complex challenge and deliver in a world-class and innovative way.

The Canadian Surface Combatant – the right ship for the RCN and Canada

