

OFSV1, the first vessel designed and built under NSS, launched on December 8, 2017.

# SEASPAN SHIPYARDS: PROUDLY BUILDING SHIPS FOR CANADA'S COAST GUARD AND NAVY



## DELIVERING ECONOMIC BENEFITS AND REBUILDING A GLOBALLY RECOGNIZED MARINE INDUSTRY

The most modern shipyard of its kind in North America, Seaspan has invested more than \$200 million to upgrade its facilities, equipment, and processes at Vancouver and Victoria Shipyards.

Seaspan has already committed to spend more than \$850 million through a growing marine supply chain. Over 570 companies, representing more than 90% of Seaspan Shipyards' supplier community, are Canadian suppliers who

are helping to build the next generation of Navy and Coast Guard vessels.

Seaspan Shipyards' NSS-related work is having a significant impact on the national economy. As an annual average, for the first ten years of NSS (2012-2022), Canada will realize:

- \$600 million in total annual gross value of goods and services
- \$290 million contribution to GDP



## CREATING JOBS

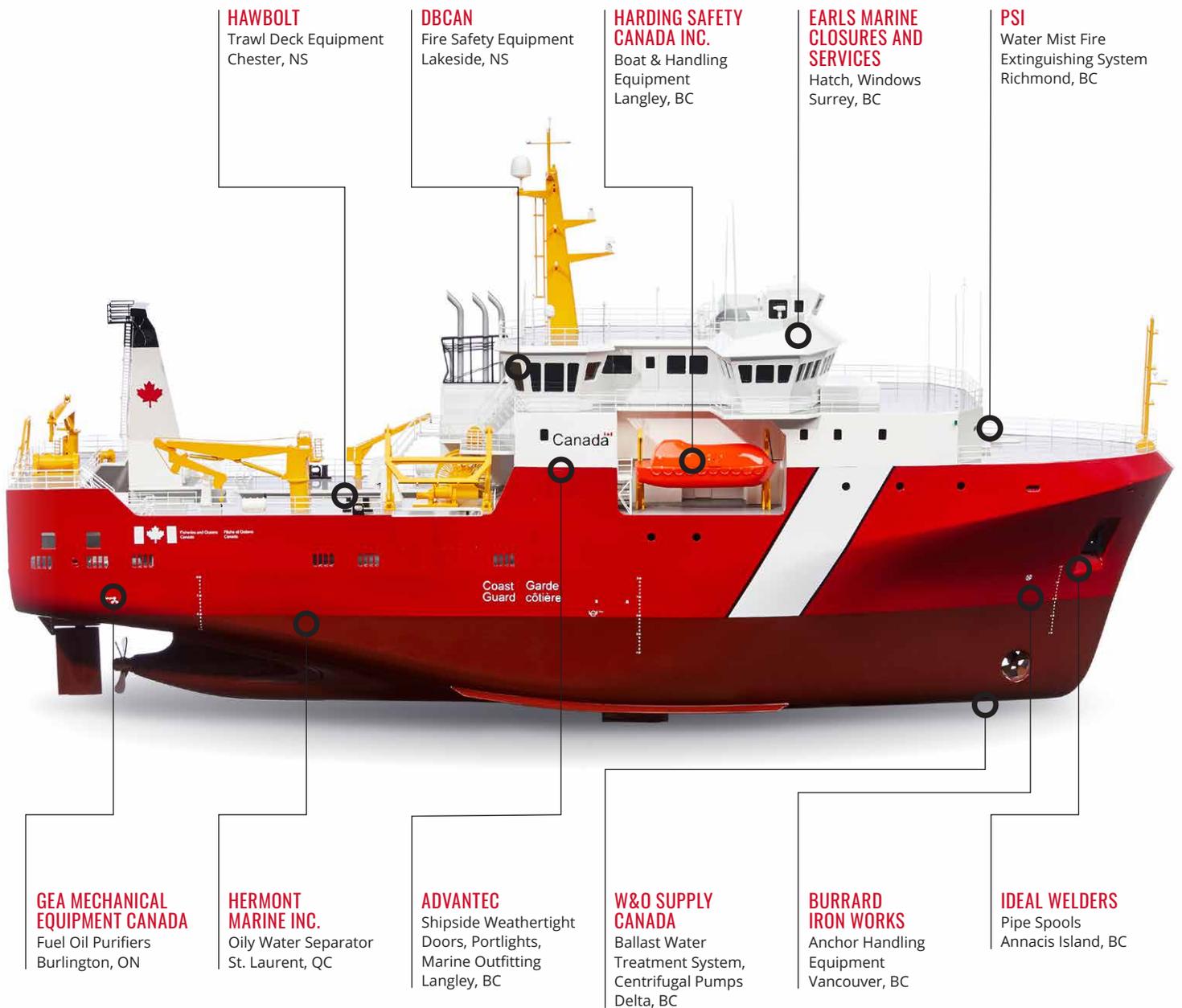
Seaspan Shipyards is leading the way in training and employing Canada's next generation of highly skilled shipbuilders, including:

- Welders, pipefitters, electricians and other tradespeople.
- Professionals, such as engineers, naval architects and procurement specialists.
- More than 100 internships per year.
- 100 apprentices active across Seaspan Shipyards.

*Seaspan Shipyards  
directly employs more  
than 2,300 people.*

# RE-ESTABLISHING THE CANADIAN SHIPBUILDING INDUSTRY

## OFFSHORE FISHERIES SCIENCE VESSEL



# EMPLOYING AND TRAINING CANADIAN SHIPBUILDERS

## MEET SOME OF OUR SUPPLY CHAIN PARTNERS

### THALES CANADA

NSS work has allowed Thales Canada to invest in developing improved technology solutions for NSS ships that the company plans to leverage for future projects in Canada and internationally.

### GENOA DESIGN INTERNATIONAL

Genoa from Mount Pearl, Newfoundland, is helping to build ships through the use of technology that extracts design specifications from 3D models. Since beginning work on the NSS, the company has grown 300%. It has added to its capacity and capabilities, and created an in-house academy for technical and career development.

### BRONSWERK MARINE

Thanks to their contract with Seaspan Shipyards for HVAC work on the OFSV program, Bronswerk, of Brossard, Quebec, is able to build their design, manufacturing and installation capacity in Canada to take their company to the export market.

### VARD MARINE

NSS work has resulted in approximately 40 new, high-value jobs within Vard Marine as well as the founding of Vard Electro Canada, formed in 2016 for the specific purpose of transferring marine electrical engineering capability and technology from Norway to Canada. Vard Electro Canada currently has seven employees working on the NSS.

### JOINER SYSTEMS

Joiner Systems of Montreal, Quebec, is a leader in providing engineered solutions for marine interior outfitting. With the ability to manufacture to strict specifications, the company provides everything from insulation to furniture installation.

## OUR PEOPLE



### KENDALL TROUT

*Steel Fitter Apprentice*

Kendall Trout, a Steel Fitter Apprentice, notes that thanks to the NSS she can enjoy a career in an industry she loves while developing her skills. Asked about the opportunities that her work at Seaspan has afforded her, Kendall said: "Shipbuilding hasn't just given me a job; it's given me a career. I love coming to work every day. I'm constantly growing my skills and learning about the industry. The NSS is just beginning and the future looks very bright."



### BLAKE CROME

*Apprentice Welder*

Blake Crome, apprentice welder, is also part of the next generation of Canadian shipbuilders. Unlike work in some sectors, like the oil and gas industry in more remote parts of B.C. and Alberta, Vancouver Shipyards presents a chance for workers to build their expertise and be home with their families. Blake understands that appeal. "I knew it was going to give me the opportunity to stay local with my work," he says.

## MORE THAN \$6 MILLION TO SUPPORT EDUCATION AND SKILLS DEVELOPMENT, INCLUDING:

### UNIVERSITY OF BRITISH COLUMBIA

\$2 million to support innovative teaching and research for the Naval Architecture and Marine Engineering graduate program at the University of British Columbia.

### BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

\$300,000 to the British Columbia Institute of Technology to support Aboriginals in trades – anticipated to provide training opportunities for an additional 100 indigenous students over the next three years.

### CAMOSUN COLLEGE

\$300,000 to Camosun College to support the goal of boosting the number of women in trades training.

### CANADIAN WELDING ASSOCIATION FOUNDATION

\$300,000 to the Canadian Welding Association Foundation for new welding equipment and teacher professional development.

## NATIONAL SHIPBUILDING STRATEGY (NSS)

Seaspan Shipyards is building the next generation of non-combat ships as Canada's long-term strategic partner under the NSS. With its modern new construction facilities and expert workforce, Seaspan is delivering on its commitments to the Canadian Coast Guard and Royal Canadian Navy.

# CANADA'S NEXT GENERATION OF NON-COMBAT VESSELS

## OFFSHORE FISHERIES SCIENCE VESSEL

A 63m fisheries research vessel, that will be deployed on Canada's east and west coasts to increase our understanding of the health of fish stocks, and their ocean environment.



## OFFSHORE OCEANOGRAPHIC SCIENCE VESSEL

An 86m oceanographic research vessel, that will be deployed on Canada's east coast to increase our understanding of the ocean's physical environment, including the impact of climate change.



## POLAR ICEBREAKER

A 150m icebreaker, with year-round operational capability in Canada's Arctic Ocean, providing essential safety, commercial, and security services to Canada's northern communities.



## JOINT SUPPORT SHIP

A 174m naval support ship, deployable around the world, in any naval theatre or threat environment, it will provide fuel, ammunition, provisions, and other material to Canada's Navy.



# BUILT FOR THE FUTURE OF CANADA'S OCEAN SCIENCES

OFFSHORE FISHERIES SCIENCE VESSEL



*The OFSV is designed to keep up with fishing trawlers of the future. These vessels will be able to trawl to depths of 2500m with 4650ekW of power.*

Seaspan Shipyards was competitively chosen to build three Offshore Fisheries Science Vessels (OFSV) under the National Shipbuilding Strategy (NSS). Purpose-built to serve the needs of the Canadian Coast Guard (CCG), these vessels will be stationed on Canada's coasts and will support critical scientific research and ecosystem management initiatives. The vessels were designed and built to operate quietly, so as not to disturb marine life, and include the most modern trawling gear. Once complete these new vessels will provide the technology and facilities needed for

Fisheries and Oceans Canada (DFO) to successfully complete oceanographic survey missions and sampling at up to 2,500 meters of depth.

These ships will serve an important role in monitoring the health of fish stocks, understanding the impacts of climate change, and supporting research that allows us to better understand the ocean environment. They will also play a critical role in supporting evidence-based decision making that protects the health of Canada's marine environment.



*The OFSV will be the primary offshore fisheries science platform for Fisheries and Oceans Canada.*

*Containing wet and dry labs specifically designed with conveyors, the OFSV is equipped to carry out science research missions.*

*The OFSV is equipped to carry out secondary missions, such as environmental response to protect Canada's coasts.*



# 3 OFFSHORE FISHERIES SCIENCE VESSELS

## BUILT FOR THE FUTURE OF CANADA'S OCEAN SCIENCES



### FISHING TRAWLS

Capable of deploying fishing trawls up to 2,500 meters and fitted with high-tech electronic trawl monitoring systems.

### SCIENTIFIC LABS

Four scientific labs, including a wet lab, a dry lab, an ocean lab and a control lab, are contained within the vessel.

### MULTI-MISSION CAPABILITY

Hydraulic winches, boom and A-frame, for deployment of a wide variety of scientific research packages.

### DEPLOYABLE DROP KEEL

The deployable drop keel is the first drop keel to be installed on a Canadian Coast Guard vessel.

### ACOUSTIC SURVEY EQUIPMENT

Fitted with the most modern acoustic survey equipment, mounted both on the hull and in a drop keel.

### ICE-STRENGTHENED HULL

The hull is designed and built to operate in areas with thin layers of ice.

## OFFSHORE FISHERIES SCIENCE VESSEL SPECIFICATIONS

Length Overall	63.4 m	Cruising Speed	8 knots	Light Ship Weight (EOSL)	2468 t
Breadth (Moulded)	16.0 m	Top Speed	12.5 knots	Classification	Lloyd's Ice Class PC7
Design Waterline	6.15 m	Range	6400 NM	Fishing Missions	8
Design Displacement	3212 t	Complement	36 Persons	Oceanographic Missions	11

## NATIONAL SHIPBUILDING STRATEGY (NSS)

As Canada's long-term strategic partner under the NSS, Seaspan Shipyards is building the next generation of non-combat ships. With its modern new construction facilities and expert workforce, Seaspan is delivering on its commitments to the Canadian Coast Guard and Royal Canadian Navy. This package of non-combat ships includes three Offshore Fisheries Science Vessels (OFSV), the first of which was launched in 2017.



# CANADA'S MOST MODERN SCIENCE RESEARCH VESSEL

OFFSHORE OCEANOGRAPHIC SCIENCE VESSEL



*With its extensive sensor suite and permanent and portable labs, OOSV will support a range of research and be able to meet the needs of scientists now and into the future.*

As part of the National Shipbuilding Strategy, Seaspan Shipyards will build the Offshore Oceanographic Science Vessel (OOSV), a fully modern and versatile science research vessel. Designed to serve the needs of the Canadian Coast Guard (CCG), the OOSV will be the primary oceanographic science platform for Fisheries and Oceans Canada (DFO). OOSV is outfitted for marine surveys and scientific research on ocean currents and the seabed. It will also monitor interactions of the ocean with winds

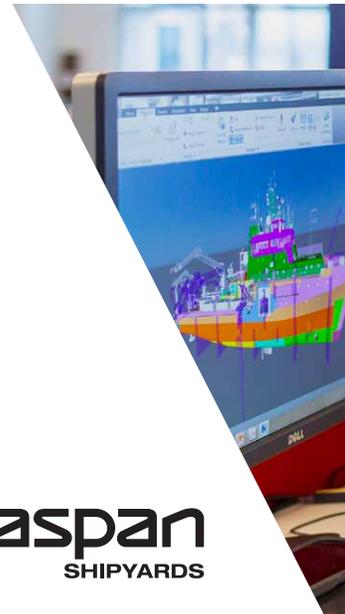
and waves. A key part of its mission will be increasing our understanding of the impact of climate change on oceans.

In addition to serving the diverse needs of oceanographic researchers, the OOSV is capable of performing important CCG secondary missions, including search and rescue, environmental protection, and aiding navigation. This vessel will be operational year round in Canada's Pacific and Atlantic coasts, in the Gulf of St. Lawrence and in the Arctic during the summer.

*The OOSV will be the primary offshore oceanographic science platform for Fisheries and Oceans Canada.*

*A multi-task vessel, the OOSV will be capable of oceanographic, fishery, geological and hydrographic survey missions.*

*OOSV can perform Search and Rescue and contribute to our understanding of the impact of climate change on our oceans.*



# 1 OFFSHORE OCEANOGRAPHIC SCIENCE VESSEL

## CANADA'S MOST MODERN SCIENCE RESEARCH VESSEL



### DYNAMIC POSITIONING

Fitted with a system that controls the steering, propulsion and bow thruster to automatically hold the vessel, a critical function for most scientific missions.

### MULTI-MISSION CONFIGURABILITY

The main working area of the vessel is designed with a grid pattern that allows the deck to be rearranged to adapt to the specific needs of each scientific mission.

### SAMPLE COLLECTION

Capable of taking core samples to depths of up to 25 metres deep beneath the seafloor.

### ACOUSTIC SURVEY EQUIPMENT

Fitted with the most modern acoustic survey equipment mounted both on the hull and in a drop keel.

### SEISMIC RESEARCH CAPABILITY

Equipped with an air compressor, rated for 25,000 psi, used in conducting seismic research.

## OFFSHORE OCEANOGRAPHIC SCIENCE VESSEL SPECIFICATIONS

Length Overall	86.1 m	Cruising Speed (for range)	12 knots	Light Ship Weight (EOSL)	2,950 t
Breadth	16.0 m	Top Speed	13+ knots	Classification	Lloyd's Register 2015 Ice Class PC6
Design Waterline / Draft	6.2 m	Range	12,000 NM		
Design Displacement	4,483 t	Complement	56 Persons		

## NATIONAL SHIPBUILDING STRATEGY (NSS)

As Canada's long-term strategic partner under the NSS, Seaspan Shipyards is building the next generation of non-combat ships. With its modern, new construction facilities and expert workforce, Seaspan is delivering on its commitments to the Canadian Coast Guard and Royal Canadian Navy, including the Offshore Oceanographic Science Vessels, which will be built at Vancouver Shipyards.



# SUPPORTING CANADA'S ROLE IN THE WORLD: HMCS PROTECTEUR AND PRESERVER

## JOINT SUPPORT SHIPS

*With the Seaspan-built Joint Support Ships, the Royal Canadian Navy (RCN) will have the purpose-built ships necessary to support Canada's role in the world. With the ability to support training and naval manoeuvres and to provide support to humanitarian operations and disaster relief, these ships will help Canada's women and men in uniform to accomplish their important missions.*

Her Majesty's Canadian Ships (HMCS) Protecteur and Preserver are multi-role vessels that will provide an important auxiliary function to the RCN. They increase the range and endurance of naval task groups by permitting the vessels to remain at sea for long periods of time without needing to return to port for replenishment. They represent crucial elements of Canada's blue-water naval capabilities and will allow the RCN to participate in operations with allies on military and humanitarian missions.

These vessels are designed and built to carry provisions like food, water, fuel and ammunition for other vessels, and provide support ashore as well as a home base for helicopter maintenance and operations. With its enhanced defensive capabilities and a crew of 239 personnel, the JSS can also support the Royal Canadian Navy in high threat environments ensuring our continued safety and security at home and abroad.

*Joint Support Ships permit the Royal Canadian Navy to operate effectively with allied navies even when they are far from home port.*

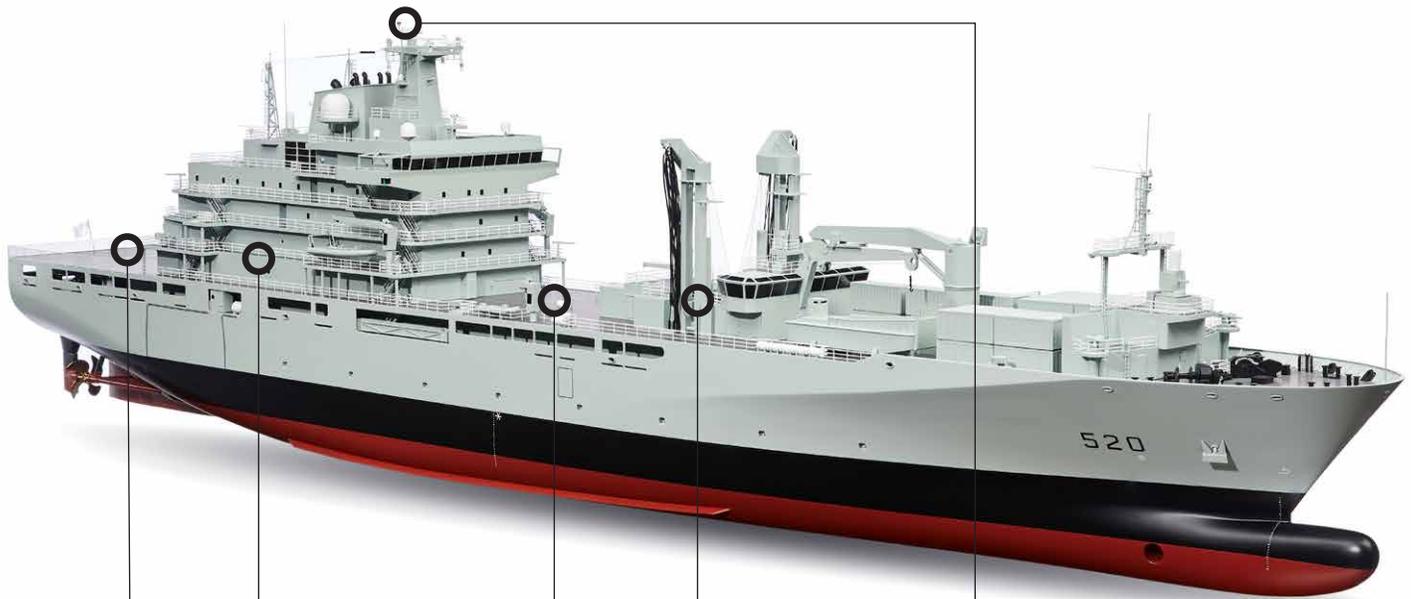
*Seaspan Shipyards has worked with the Royal Canadian Navy to ensure these ships fully meet Canada's needs and contain modern systems and equipment.*

*Canada's auxiliary ships are being built based on a successful design that was used to construct Germany's replenishment vessels.*



# 2 JOINT SUPPORT SHIPS

## HMCS PROTECTEUR AND PRESERVER



### HELICOPTER HANGAR

Flight Deck and Hangar designed to support operations and maintenance of two CH-148 Cyclone Helicopters; Flight Deck can support one Canadian Chinook helicopter.

### MEDICAL FACILITIES

Equipped with modern hospital, dental, and communications facilities that meet Canadian and NATO medical standards.

### SUPPORT TO OPERATIONS

With deck space for carrying vehicles, containerized cargo, spare parts and food and water, the JSS is fully equipped to support naval operations.

### REPLENISHMENT AT SEA

The Joint Support Ships can carry approximately 6,000 tonnes of marine fuel, 875 tonnes of aviation fuel and 1,100 tonnes of ammunition.

### COMBAT-EFFECTIVE VESSEL

Designed with enhanced defensive capabilities and space for 239 Royal Canadian Navy personnel, the Joint Support Ships are built to succeed in high threat environments.

## JOINT SUPPORT SHIP SPECIFICATIONS

Length Overall	173.7 m	Top Speed	20 knots
Breadth	24.0 m	Range	~10,800 NM
Design Waterline / Draft	7.4 m	Complement	239 Persons
Design Displacement	19,648 t	Light Ship Weight	10,895 t
Cruising Speed (for range)	15 knots	Classification Society	DNVGL (GL Rules 2012)

## NATIONAL SHIPBUILDING STRATEGY (NSS)

As Canada's long-term strategic partner under the NSS, Seaspan Shipyards is building the next generation of non-combat ships. With its modern new construction facilities and expert workforce, Seaspan is delivering on its commitments to the Canadian Coast Guard and Royal Canadian Navy. This package of non-combat ships includes two Joint Support Ships.



# BUILDING CANADA'S MULTI-MISSION POLAR ICEBREAKER

POLAR ICEBREAKER

*Canada's new Polar Icebreaker will be the Canadian Coast Guard's multi-role vessel, designed with a high degree of operational flexibility to support multiple missions, including important Arctic science programs.*

The Polar Icebreaker will be a modern, multipurpose, 3-season vessel, with the ability to overwinter as needed. The ship will be capable of breaking up to 2.5 metres of ice and can sustain operations in 2.2 metres of level ice. This ice breaking capability is a key design feature which allows the Canadian Coast Guard (CCG) to deliver a variety of important programs.

Some of these missions include search and rescue, environmental response, marine navigation, icebreaking and arctic science. The Polar Icebreaker

will also support Community and Northern resupply missions through escort icebreaking to allow commercial fleet owners to deliver goods. The Polar Icebreaker can also deliver goods directly when commercial options aren't available.

This vessel is configured to minimize the exposure of the crew and mission personnel to extreme weather conditions, making the Polar Icebreaker a vital instrument for carrying out important Canadian Coast Guard missions in the Arctic.

*The Polar Icebreaker will support Canada's Arctic missions, sovereignty, and presence.*

*Canada's Icebreaker has a logistical endurance of 270 days in the Arctic.*

*The Polar Icebreaker is a modern, multi-purpose, three-season vessel, capable of safely overwintering.*



# 1 POLAR ICE BREAKER

## BUILDING CANADA'S MULTI-MISSION POLAR ICE BREAKER



### HELICOPTER OPERATIONS

Fully outfitted for Arctic operations with a hangar that can accommodate two medium-lift helicopters.

### GARAGE

Equipped with a garage to accommodate vehicles to support various mission requirements and activities taking place on ice.

### MOON POOL HANDLING SYSTEM

Designed to safely deploy science equipment through the centre of the vessel in ice-infested waters.

### HIGH-ARCTIC OPERATIONS

Designed to carry out missions May through January and able to safely operate over winter in the Arctic.

### ICE-BREAKING CAPABILITY

Capable of breaking 2.5 metres of ice at 3 knots.

## POLAR ICE BREAKER SPECIFICATIONS

Length Overall	150.1 m	Design Displacement	23,700 t	Complement	60 Core + 40
Breadth	28.0 m	Max Speed	18 knots	Light Ship Weight	15,481 t
Design Waterline / Draft	10.5 m	Range	26,000+ NM @ 12 knots	Classification	Lloyd's Ice Class PC2

## NATIONAL SHIPBUILDING STRATEGY (NSS)

As Canada's long-term strategic partner under the NSS, Seaspan Shipyards is building the next generation of non-combat ships. With its modern new construction facilities and expert workforce, Seaspan is delivering on its commitments to the Canadian Coast Guard and Royal Canadian Navy. This package of non-combat ships includes one Polar Icebreaker.

