



SHIPBUILDING AND REPAIR

Making way through Arctic ice

Canada's potential as an Arctic shipbuilder

As an Arctic nation, Canada should be poised to seize the commercial opportunities presented by a rapidly changing Arctic. The melting and thinning sea ice has created new shipping opportunities in the Arctic Ocean Basin. These include destination shipping, natural resource development as well as fisheries, scientific research, eco-tourism and security and defence. Each of these opportunities requires specialized Arctic-capable vessels.

**The CCGS Louis S. St-Laurent
will be decommissioned
in 2017.**



Photo: Canadian Coast Guard

The National Shipbuilding Procurement Strategy (NSPS) creates a great opportunity for Canada to develop a national high-technology industry sector in its own right. With a focus on Arctic vessels, Canada can reach out globally and become a world leader in Arctic vessel design, development and construction. We did it before in the Beaufort Sea with the development, design and construction of leading icebreaker designs during the offshore hydrocarbon development, with a focus on operations in a harsh, offshore ice environment. We can do it again in this century.

In the coming decades, billions of dollars will be spent to build Canadian combatant and non-combatant vessels. The spinoffs from this construction will last well into the future and will position Canada as a maritime nation.

We need to change the way we look at the Arctic, and look at the entire Arctic Ocean Basin as an integral ocean unit. Canada's future lies in a changing geopolitical world, impacted by environmental changes that will see international shipping routes altered, and new requirements for a wide range of specialized and purpose-built vessels to operate in



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the Arctic Ocean on a year-round basis. Canada's coastline spans 244,000 kilometres, with 9.3 million square kilometres of ocean space under Canadian jurisdiction. Much of that area is in our North. In order to exercise jurisdiction, we need the marine capability that Arctic-capable vessels bring. This will require icebreakers because ice-free does not mean no ice.

There will still be a strong need for governmental vessels that will engage in icebreaking, hydrographic surveying, scientific research, pollution response and salvage. The need for specialized icebreakers will only increase, especially for those that can operate year-round in the Arctic Ocean Basin. In the coming decades, countries that have a robust Arctic marine capability will have a major impact in this region operationally, politically and commercially, and will be able to remain more autonomous with respect to their national interests.

One country that recognizes this requirement is China, and that that is why it operates the largest non-

nuclear icebreaker in the world, the Xue Long (Snow Dragon), and has a new as-yet unnamed icebreaker under construction, valued at \$300 million.

Russia also has an ambitious shipbuilding program to enhance its Northeast sea route along the top of Siberia. It has committed to making this a major international shipping route. Canada, as an Arctic nation, must reboot and develop this marine capability to design and build icebreakers. It is an opportunity that Canada must seize. If Canada does not, other Arctic countries will.

NSPS must act as a catalyst for Canada to develop such an Arctic initiative. As part of NSPS, the Canadian Coast Guard's Polar Icebreaker Project's new vessel, the CCGS John G. Diefenbaker, will replace the CCGS Louis S. St-Laurent, Canada's largest icebreaker. This is a key cornerstone of Canada's Northern Strategy, as it will extend the icebreaking capability of the Canadian Coast Guard into the spring and fall seasons in the Cana-

dian Arctic, with a capability to face more difficult ice conditions.

The Polar Icebreaker Project has a budget of \$720 million for the design, development and construction of the Polar class vessel. A \$9.5-million contract has been awarded to STX Canada to develop the detailed design effort for the new icebreaker. This will be completed by 2013, after which construction will begin. The CCGS John G. Diefenbaker will be delivered to coincide with the decommissioning of the CCGS Louis S. St-Laurent in 2017. The CCGS John G. Diefenbaker could overwinter if needed, and will be used solely for Arctic operations.

The vessel will be between 120 and 140 metres in length, and will carry a crew of 100 with additional accommodation for 25 more. This will help Canada realize the opportunity to become a world leader in polar vessels. Canada could take the lead in many ways, including ship design, research and development, ship construction, and the operation of Arctic vessels in a sustainable fashion.



Canada and the U.S. share common interests in the Arctic.

Photo: United States Coast Guard

There is also a need for a system to be engineered that would collect data from a variety of sensors aboard the vessels, in space, sub-sea and from aircraft, including unmanned aerial vehicles (UAVs), and fixed and rotary wing aircraft.

The new icebreaker also gives Canada a robust Arctic marine capability for the next 40 years. This is important, since Canada has entered into an international Search and Rescue (SAR) agreement that requires it to provide SAR capability in a region that includes the Arctic Ocean, extending to the North Pole. Any increase in Arctic shipping will see a corresponding rise in demand for search and rescue and pollution response capabilities in the coming years.

The Royal Canadian Navy is also planning to construct a number of Arctic/Offshore Patrol Ships (AOPS), and the Canadian Coast Guard is constructing ice-strengthened research vessels. This government-funded construction could serve as a starting point for a public-private partner-



ship, in order to build other special-purpose Arctic vessels for a variety of commercial and other governmental clients. There is a role for the federal government to champion the opportunities once they are identified. Like the rapidly changing Arctic, Canada needs to examine the options with a fresh set of eyes in the context of a public-private partnership, with support for academia and research and development coming from many different institutions and the private sector. We need to look outward across the Arctic Ocean Basin to look at these opportunities.

In Canada, we have seen this in the past with certain technologies. For example, with the Canadian Patrol Frigate Project, we continue to see the spinoff effects of the technology and various high-tech products created by Canadian companies through sales to navies around the world long after the ships have been constructed. Canada can use NSPS to showcase vessel types, Canadian technology and Canadian capability.

The International Polar Year (IPY) Conference, held in



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Photo: U.S. Geological Survey



Montreal in April 2012, highlighted the need for – and concern regarding the lack of – an internationally agreed upon Polar Code, that will set construction standards for vessels operating in a polar region. This code is being developed at International Maritime Organization (IMO).

Other issues of concern include black carbon emission of vessels, along with the potential increase of hydro-acoustic noise and its impact on Arctic marine life. It will become increasingly important for vessels to operate in environmentally sensitive manners in the Arctic. The use of marine spatial planning, both in the Arctic and elsewhere, could be used to advance sustainable shipping practices. Canada has a long history of operating in the Arctic. With the right policy emphasis, we would be well-positioned to help lead thinking on the subject of sustainable shipping at the governmental and commercial level.

There is a role for government in such an undertaking, especially if we look at Arctic marine activities as an ongoing commitment to Canadian sovereignty rather than as discrete vessels. A possible approach, referencing the Alberta oil sands, was set out in an article Big builds to shape Canadian economy, written by former Environment Minister Jim Prentice on March 14, 2012. In it, Mr. Prentice advocated governments serving as catalysts and champions to create the necessary environment for investment and research to take advantage of major new opportunities. When it comes to the Arctic, this is a natural fit for Canada, given the significant public monies that will be expended, and centres of expertise that are going to be developed to build the ships over the coming decades as part of NSPS. Canada could focus its attention on Arctic-capable vessels. Shipping is a global industry, and we need to look beyond our domestic markets for opportunities. The Arctic has the potential to present a solid marine market for purpose-built vessels.

Several collaborative opportunities exist that Canada could pursue. We will address a few of these very real opportunities.

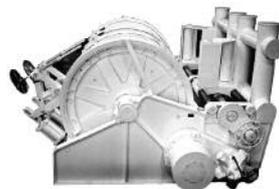
United States Coast Guard

The United States has only one light polar icebreaker, the USCGC Healey, which is used for research purposes. Two other icebreakers, the USCGC Polar Sea and USCGC Polar Star, are presently nonoperational and are at the end of their 40-year lifespans. The vessels are presently laid up in Seattle. These vessels are used to support the U.S. National Academy of Sciences in its polar research. Admiral Papp, Commandant of the United States Coast Guard, has been very vocal regarding the need for the United States to have an Arctic capability. He was recently quoted as saying that the U.S. is “behind the power curve regarding the Arctic,” and may have to rely on other nations as a result. The USCGC Polar Star is presently undergoing a \$30-million engine refit to become operational. However, that is only a stopgap solution. The U.S., like Canada, needs to replace its heavy icebreakers.

Canada and the United States share common interests in the Arctic, and Canada could take this opportunity to create a model for the development of other icebreakers that could be used by the United States. Many people do not realize that the HMCS Labrador, which became part the Canadian Coast Guard fleet, was a Wind class icebreaker developed by the U.S. Navy. Canada used the design to construct the vessel. Canada can help the United States Coast Guard get ahead of the power curve.

The United States is Canada’s best friend and ally, and there is an opportunity here to build our capability in a joint and integrated fashion. Our two Coast Guards have a long history of cooperation and of working towards common solutions in defence, search and rescue, pollution response and marine seabed mapping. Using our Polar

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class icebreaker, designed and developed under NSPS, building a series of icebreakers for use by both countries makes good economic sense and solidifies our common interest in a changing Arctic. Cooperation would also result in an economy of scale, with a decrease in vessel costs. We need to start that dialogue and explore this opportunity as a nation with the United States.

China

China has embarked on a vigorous polar scientific research program and is seeking to learn as much as possible about the Arctic Ocean and its impacts of climate change. Several factors, including recent Chinese activity in the Arctic, increasing Arctic research, the recent state visit by Chinese Premier Wen Jiabao to Iceland and Sweden, and China seeking observer status on the Arctic Council, indicate that China is seeking to have an expanded role in the Arctic Ocean Basin.

As mentioned earlier, China is constructing a second polar icebreaker to assist its research efforts, which take place both in the Arctic and the Antarctic. This is a major project that is being built to Lloyd's classification. It is likely that China will be building more icebreakers in the future as its research program develops further. It is important to note that a portion of the Arctic Ocean has the status of high seas outside national jurisdictions. China is positioning itself to reap some of these benefits in a changing Arctic. A large number of Chinese scientists attended the recent IPY Conference in Montreal, which indicates the increasing amount of research about the region, and the value China places on such research.

Mary River iron ore project

The Mary River iron ore deposit on Baffin Island could see a large number of purpose-built ice-strengthened bulk carriers transiting between Foxe Basin and Antwerp, Belgium on a year-round basis. Under Canadian regulatory

requirements, because this is an international voyage, there is no requirement to have a Canadian content. That does not preclude Canada from looking at creating a second registry or requiring some sort of Canadian content in these large bulk carriers, which could range up to 180,000 deadweight tonnes. Information based on Baffin Island submissions to the Nunavut Impact Review Board indicates that there will be 10 of these vessels built. This represents a great opportunity for the Canadian shipbuilding industry and strengthens Canada's Arctic excellence in icebreaking design in the commercial sector. In addition,



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Chinese interests have secured iron ore rights on the East side of Foxe Basin, which would also require strengthened bulk carriers.

Offshore hydrocarbon development

Various vessels have been developed for oil and gas developments in the Arctic Ocean. Recently, Shell constructed an icebreaker at the Edison Chouest Offshore shipyard in Louisiana. This vessel will be the largest ice-strengthened, anchor-handling vessel built to date, with a size of 360 feet and an estimated cost of US\$200 million. Called the Aiviq, the Inuit word for walrus, the vessel is the first of a series of specialized vessels that will support Shell in an offshore drilling program in the Chukchi Sea (between Alaska and Siberia). There are a variety of other oil and gas developments around the Arctic Ocean Basin and all require specialized vessels.

A way forward

NSPS can serve as a catalyst for Canada's development of a robust Arctic shipping capability. Working together as a nation, with the involvement of government

and the private sector, the Arctic could become Canada's mega-project of the 21st century. This will require a concerted effort and a global view, looking at the changes coming in the next decades. We can start by assisting the U.S. in protecting the Arctic waters of North America. Both our nations require a strong Arctic capability. Canada can draw on its history in the Beaufort Sea, look to the future and move forward with confidence. This will take a coming together of the marine industry, and discussion and dialogue. Canada's marine industry is world-class, and we are an Arctic nation.

Joe Spears is the Principal of the Horseshoe Bay Marine Group and in conjunction with Norstrat Consulting conducted a strategic environmental review for the Polar Icebreaker project by the Canadian Coast Guard. He also assisted in the Arctic Marine Shipping Assessment undertaken by the Arctic Council and has been involved in various aspects of shipbuilding. He can be reached at kjs@oceanlawcanada.

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