

The USCG Arctic Presence

Leveraging Canada's AOPV Design

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Executive Summary

The US Coast Guard (USCG) is facing a critical capability gap in the Arctic. Shipping is increasing, and foreign activity, particularly from China, is creating a new and dynamic security situation. This paper considers how the USCG could leverage Canada's AOPV design to close that capability gap.

Context

In June 2024, Canada, the United States, and Finland announced the Icebreaker Collaboration Effort (or ICE Pact) to enhance the three states' abilities to build and deploy icebreakers. Two overarching trends catalyzed this initiative, both of which appear to be coming to a head in 2024. The first is the persistent difficulty that both Canada and the United States have had in building icebreakers, while the second is the growing geopolitical rivalry in the Arctic and (increasingly) the Antarctic regions. This tension is most acute in the Arctic, where the North Atlantic Treaty Organization (NATO) faces an expansionist Russia and a revisionist China seeking a global footprint and influence.

Chinese Icebreakers

While Russia possesses the world's largest icebreaker fleet – and now considers itself in a state of open hostilities with NATO (if not necessarily war) – its presence and interests in the Arctic are at least well understood. Because Russia is an Arctic state and has the longest Arctic coastline and Exclusive Economic Zone (EEZ), it is a status quo actor, with little desire to unbalance regional rules and norms. Ironically, it is China – a non-Arctic state – that now presents the most dramatic challenge to Western Arctic states. That challenge is not to the defence of the region, and certainly not to state sovereignty, but rather to security and jurisdiction. Lacking a sustained presence in the region, Canada and the US will have more difficulty monitoring Chinese marine scientific research (MSR) and dual-purpose military/civilian drone and survey activity. Over the longer term, a lack of icebreaker capacity will also limit Canadian and American surveillance and control of Chinese fishing vessels, commercial activity, and pleasure cruises through territorial waters and the EEZ.

China's 2024 Arctic activities put these risks in clear view, as Beijing deployed three icebreakers into the Arctic for the first time. This included China's largest and most capable icebreaking research vessel, *Xue Long 2*, the lighter vessel *Ji Di*, and the more capable *Zhong Shan Da Xue Ji Di* – a former Canadian oilfield support vessel now operated by Sun Yat-sen University. Also on the horizon is the newly built *Tan Suo San Hao*, a Polar Class (PC) 4 vessel launched in April 2024 for the Institute of Deep-Sea Science and Engineering of the Chinese Academy of Sciences.

Chinese shipyards are now constructing icebreakers at an impressive rate. The construction of *Ji Di* and *Tan Suo San Hao* took only two years from first steel cutting to completion. The much larger *Xue Long 2*, China's first domestically built polar icebreaker, was completed in 2019 in under three years.¹

The 'Icebreaker Gap'

In contrast to the rapidly growing Chinese fleets, North American icebreaker programs have been bogged down for most of a decade. Crucially, the American Polar Security Cutter (PSC) program has been plagued by delays and cost overruns. In February 2024, the Coast Guard notified Congress that the ship would experience cost growth in excess of 20% and a schedule delay in excess of one year. The House Homeland Security Committee also asked the Congressional Budget Office (CBO) to provide independent estimates of the costs of the PSC program. Using its own weight-based cost model, CBO estimates that the cost of the first PSC would exceed the Coast Guard's current estimate by 60%.² This comes on the heels of a report by the Government Accountability Office in May 2024, which noted that the unrealistic timelines and lack of design maturity would lead to further delays. When pressed on the topic, VAdm. Paul Thomas, Deputy Commandant for Mission Support, pledged that the design would be complete, and construction begin, by December 2024. On August 7th, Vice Commandant Kevin Lunday appeared at a Brookings event and reiterated the December date.³

The PSC is a vital element of the Coast Guard's future Arctic presence. Today, the USCG has only two icebreakers. USCGC *Polar Star* is operationally committed to the annual resupply mission of US research facilities in Antarctica and spends the balance of the year undergoing overhaul and repairs to ensure the vessel is ready for the next mission. The second icebreaker, USCGC *Healy*, suffered a fire in July 2024, which knocked it out of service for several weeks. This was the second disabling fire in four years (the last was in 2020).

Bridging the gap between the current and future fleets is an essential requirement. This has manifested in the proposed procurement of the icebreaking service ship *Aiviq* as that bridge. At the Brookings event, Lunday confirmed that the Coast Guard needs "eight to nine" polar icebreakers and the need for congressional approval and funding to acquire a commercially available icebreaker.⁴ Even if this is approved, however, a repurposed *Aiviq* will not provide a meaningful presence until the summer of 2027.⁵ This falls well short of Coast Guard requirements, which are set at eight polar icebreakers (four heavy and four medium).⁶

Short-Term Opportunities

Resolving these difficulties over the long term requires real action on the ICE Pact's proposed information/design sharing, workforce collaboration, and supply chain harmonization. In the short

term, however, more unorthodox thinking is required. Simply put, there is no way for the US Coast Guard to rebuild its Arctic presence over the next one to five years on its own. Failing to rapidly recapitalize means being absent in the Arctic region while competitors expand their presence, leading to gaps in situational awareness and jurisdictional enforcement. Beyond the operational issues, this absence will create dreadful optics as larger Chinese fleets operate off Alaska, absent of any American presence.⁷

Leveraging the ICE Pact, the USCG should consider three radical solutions to this immediate deficit. Canada is several years ahead of the US in its icebreaker program(s). While Seaspan Shipyards in British Columbia has begun construction of the Canadian Coast Guard's heavy icebreakers, Irving Shipbuilding (ISI) in Halifax is now eight years into the construction of the *Harry DeWolf*-class Arctic and Offshore Patrol Vessels (AOPVs). With five ships now delivered to the Royal Canadian Navy, the ISI yards have built a hot production line and significantly reduced work hours per vessel.⁸

The AOPVs offer the USCG an interesting opportunity. They are not icebreakers in the traditional sense and not the medium icebreakers that are called for in the Coast Guard's Fleet Mix Analysis. While they can break 1-1.5 metres of ice at three knots (similar to USCGC *Healy*), they have only 40% of the displacement and 64% of the horsepower. They are PC-5 ships (with a PC-4 bow), designed for patrol in icy waters, rather than icebreaking through heavy pack ice. They are also not designed for operations in heavy concentrations of old ice. Less capable than *Xue Long 2* or *Zhong Shan Da Xue Ji Di*, but with a rough Polar Class equivalency to *Xue Long* (1) and superior to *Ji Di*,⁹ the AOPVs were designed for surveillance, patrol, and support for constabulary duties, consistent with USCG missions.

The AOPVs have something to offer because their design better reflects some of the emerging challenges in the Arctic. When the USCG began planning its recapitalized icebreaker fleet, the primary concern remained commercial activity, civilian shipping, and the need to break ice and undertake scientific research. These considerations have not disappeared; however, a patrol requirement has been added as adversary activity has increased and the prospect of enforcement action has become more realistic. While the USCG requires icebreakers for traditional tasks, they are overbuilt and too expensive for patrol and surveillance work.

The AOPVs are a middle ground of sorts. While smaller than a medium icebreaker and with less capability to support commercial activity, they are strong enough to operate in the Arctic during the summer and shoulder seasons, and cheap enough to avoid draining a budget. That low cost would also allow them to be acquired in numbers sufficient to give the USCG the presence and coverage in the region that a small number of more capable icebreakers would not. As the Coast Guard examines its requirements for the Arctic, they can be sorted into two major bins: those of presence, and those of access. The future PSCs will guarantee year-round access to any maritime location needed. The AOPV could address a desperately needed capacity to fill an emerging gap in Arctic presence.

Indeed, the philosophy behind the AOPV design was that heavy icebreaking power is not needed to address most emerging Arctic threats, which are less likely to arise in the winter, when sea ice limits access to all but the strongest icebreakers. Almost all Arctic activity takes place in the summer and shoulder seasons, when the region is accessible. History has certainly borne this out.

Chinese icebreakers typically arrive in the summer and depart before the ice fully returns in the fall. The same can certainly be said of the less capable fishing, commercial, and civilian vessels that the USCG can expect to arrive in the region over the coming decades. As such, the vast majority of the patrol and surveillance requirements for the USCG fall into a timeframe where heavy icebreaking capabilities are helpful but not absolutely required.

The acquisition of one or more Canadian-designed AOPVs would therefore fill a critical gap in USCG capacity. It would provide a short-term boost to return the Coast Guard to the Arctic, to monitor and police foreign activity, enforce American jurisdiction, and counter the impression that the US and its allies have ceded the Arctic to authoritarian powers. Below are options to make this a reality. Each of these options carries very real operational and political difficulties, and the authors of this research note do not pretend that execution on any of these would be straightforward or easy. Given the seriousness of the USCG's situation, however, these ideas are feasible, assuming that the will and political capital can be mustered.

AOPV Purchase

An obvious answer for the USCG would be to acquire an AOPV from the hot production line in Halifax. The final vessel in this class is intended to be delivered to the Canadian Coast Guard in 2027. Meanwhile, full-rate production of the River-class destroyers for the Royal Canadian Navy (RCN) is slated to begin in 2025. Shipyard space is therefore tight; however, because ISI has become so effective at producing the AOPV, there is room to add one additional vessel to the schedule without impacting the construction of the River class.¹⁰

The advantage of procuring that additional ship is clear. It would add a PC-5 patrol ship to the USCG (or even US Navy [USN]) fleet in the 2027-28 timeframe, well in advance of the Polar Security Cutters. That timeline is also solid, as the inevitable glitches in new ship builds have been worked out and the ISI yards are now comfortably turning out ships at a rate of more than one per year. The cost and quality of the build would also be attractive given that the ninth ship would have seen the Canadian Navy identify most build technical issues.¹¹ To do this, President Biden should authorize a one-time national security waiver of the *Buy American Act* and build an AOPV for the USCG at Irving.

For Canada, the advantage of such a purchase would be the income flowing to the ISI yard and the added employment and training benefits to the shipyard workers. It would also set a useful precedent of Canadian shipbuilders exporting to allied partners. For the US, the cost of such a purchase may also be attractive, as the USCG would enjoy the economies of scale built into the program by the large RCN and Canadian Coast Guard (CCG) purchases, as well as the Canadian government's investment in the ISI yards as part of the National Shipbuilding Strategy.

AOPV Lend-Lease

A more rapid and controversial option for rebuilding USCG capacity in the Arctic is a lend-lease arrangement with Canada. This would entail Canada leasing one of its five AOPVs to the USCG or USN to operate as a gap filler. The advantages of such an arrangement are obvious. The US would gain access to a PC-5 patrol ship immediately, without the need for the extensive refits envisioned for *Aiviq* (which the USCG is in the process of purchasing). That ship could be

employed on patrol duties in the Arctic, freeing up the overtaxed *Healy* to undertake necessary icebreaking. As an added benefit, a lend-lease arrangement would allow the USCG to gauge the utility of lighter patrol ships for Alaskan waters and better determine whether a wide procurement might be useful or if the service's initial focus on heavy and medium icebreakers remains valid.

For the Canadian Navy, the loss of a ship would be galling, particularly as it is looking to recapitalize and expand. In practice, however, there may be a window where it makes sense. Like the rest of the Canadian Armed Forces (CAF), the RCN is suffering a personnel crisis and is having difficulty crewing all of its ships. To make full use of the AOPVs, the RCN would have to achieve significant success with its recruitment efforts while also phasing out the *Kingston*-class patrol ships. This may be achievable; indeed, the Navy is gaining traction with its new recruiting initiatives.¹² However, there may still be bottlenecks, such as a dearth of qualified marine technicians able to operate the AOPVs' HV diesel-electric engines.

Simply put, it is likely that the RCN, despite its efforts, will not be able to make full use of all its new AOPVs in the short term. The lease of one underused vessel to the USCG or USN may even support the RCN's longer-term rejuvenation, as those American funds could be channeled back into RCN efforts to further improve personnel quality-of-life initiatives.

Politically, a transfer would be awkward but manageable if framed properly. There is certainly a precedent. During the Second World War, the US lent several icebreakers to the Soviet Union on national security grounds. This is also reminiscent of the current AUKUS arrangement to sell in-service *Virginia*-class US submarines to Australia as an operational bridge to the Australian Navy's domestically produced submarines. For Canadians, long accustomed to being dependent upon the American military for security, the prospect of reversing that pattern may even offer a psychological and political bonus.

American AOPV Build

A longer-term but still viable option would be a domestic US build of its own fleet of AOPVs. While this would not deliver a capability in the next few years, it would still offer the USCG the opportunity to recapitalize many years ahead of its current schedule.

The USCG's fleet analysis studies have determined that it will need four to five medium icebreakers (currently under the notional name "Arctic Security Cutters").¹³ Under the auspices of the ICE Pact, the USCG could adopt the now mature AOPV design and award a contract to build the next flight of vessels at a US shipyard. Through close cooperation with ISI, many of the benefits of the refined design and production efficiencies could be preserved. Part of the ICE Pact is workforce exchange and knowledge sharing, and it is easy enough to envision a transfer of skills and methodologies across the border.

While the current AOPV design may not be exactly what the USCG is looking for in a medium icebreaker, it would be easy to augment the ship with different communications equipment, command and control capabilities, or US-specific requirements. The ship could also be easily augmented to employ a larger helicopter, since the current design is fitted for (but not with) the Bear Trap needed to launch and recover aircraft as big as the CH-148 Cyclone. The vessels could

also see some limited combat enhancements to the existing 25mm gun using containerized weapons systems, with which the US Navy is already experimenting.¹⁴

Conclusions

Canada's AOPV design is not the medium icebreaker envisioned in the USCG's fleet mix analysis. Unlike the Coast Guard's current medium icebreaker, *Healy*, the AOPVs are not suited to operations in dense old ice or in support of civilian shipping in the Arctic. Yet, as patrol ships, the AOPVs offer capability at the margins that may find a sweet spot in the emerging Arctic security dynamic. What the USCG requires quickly is the ability to project presence in Arctic waters, to monitor and patrol the region and to be seen doing it. The melting ice also means that such operations are increasingly in waters well suited to the lighter AOPV. Now in crisis, the USCG's Arctic fleet may benefit from light patrol vessels able to fulfill constabulary roles, while freeing up current and future heavy icebreakers for more traditional tasks.

Working with Canada would have several clear advantages. Operating a common class of North American Arctic patrol ships would be mutually beneficial as supply chains were harmonized and parts were produced in larger numbers. Given the interoperability of the platforms, efficiencies could also be captured in training and operations. Construction and maintenance would be made exponentially easier, faster, and cheaper, given the common shipyard training systems, parts inventories, and methodologies. Operations would also be facilitated by exchanges and easier application of lessons learned across services.

The adoption of the AOPV design is not currently envisioned by the USCG and certainly does not offer it everything for which service documents call. However, it does have the potential to fill a clear and worsening gap in the American Arctic presence, relatively quickly and affordably. It would also be fitting that the shared interests in Arctic security between the US and Canada could be met with a shared fleet of commonly designed, constructed, and equipped icebreakers.



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Notes

¹ Malte Humpert, “China Deploys Three Icebreakers to Arctic as U.S. Presence Suffers After ‘Healy’ Fire,” gCaptain (August 20, 2024).

² “The Cost of the Coast Guard’s Polar Security Cutter,” Congressional Budget Office (August 2024).

³ “Navigating global challenges: A conversation with Vice Commandant of the Coast Guard Admiral Lunday,” Brookings Institute (August 7, 2024).

⁴ Ibid.

⁵ “The Cost of the Coast Guard’s Polar Security Cutter.”

⁶ Department of Homeland Security, United States Coast Guard, Coast Guard Fleet Mix Analysis: Fiscal Year 2022 Report to Congress (April 11, 2023).

⁷ Historically, Chinese icebreaker operations have concentrated off Alaska for most of their Arctic research.

⁸ Based on conversations with ISI and RCN personnel.

⁹ Comparing ice capability is often difficult given different sizes, power, and classification. *Xue Long*, for instance, is rated CCS B1* – roughly comparable to a PC-5 or PC-6 vessel.

¹⁰ This scheduling insight came from personnel with trustworthy knowledge of ISI capabilities and build times.

¹¹ The early AOPVs suffered from issues with their engines and forecastles flooding, for instance.

¹² Michael Williams, “Canadian Armed Forces recruitment program shows promise,” CityNews (July 5, 2024).

¹³ “Coast Guard Polar Security Cutter (Polar Icebreaker) Program: Background and Issues for Congress,” Congressional Research Service (April 29, 2024).

¹⁴ Adam Lajeunesse, “An AOPS That Can Fight? Patrol Ships for an Increasingly Dangerous World,” *Canadian Military Journal* 23, no. 4 (Fall 2023): 19-24.