



EXISTING SUBMARINE DESIGNS THAT COULD MEET CANADA'S NEEDS

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As the Canadian Patrol Submarine Project considers how to best replace the *Victoria*-class and deliver the military capabilities that Canada could need in this period of great-power conflict, it might find it useful to understand how well existing platforms deliver those capabilities. Canada's path to replacing the *Victoria* class could be easier – both in cost and schedule – if existing designs are able to deliver Canada's preferred capabilities.

While Canada has not formally announced its requirements for the Canadian Patrol Submarine Project, public comments indicate that Canada's requirements may include:

- Diesel attack submarine (SSK)
- Operating range of 6,000 nm
- Under-ice capability
- Interoperable with the U.S.'s *Virginia*-class combat system (leveraging Canada's prior investment in this system)
- An established, persistent parent navy (to reduce Canada's in-service support burden)

Using publicly available information, we assessed 41 allied navy submarine designs against these potential requirements (Figure 1), identifying 3 submarine designs that could meet Canada's potential requirements: Japan's *Soryu* and *Taigei* classes, and South Korea's *KSS-III* class.

If valid, this assessment has potential implications for Canada's approach:

- Canada's potential requirements may not be commonly found together, implying that Canada might need to be flexible on requirements (e.g., under-ice capability, persistent parent navy), willing to engage in a limited-competition procurement (e.g., 1 or 2 bidders), or able to shoulder the design-build cost of a new, bespoke design
- The combination of SSK and under-ice capable is relatively rare – many nuclear submarines can operate under-ice, but not many diesel attack submarines can
- Several potentially attractive designs have not been built (e.g., Shortfin *Barracuda*, *Type 216*, *A26-ER*), and Canada would likely incur additional costs due to first-of-class cost growth and the in-service support burdens that fall to a parent navy
- If only 3 operating submarine designs meet Canada's potential requirements, there may not be an opportunity to buy a "used" submarine (like Canada did with the *Upholder* / *Victoria*), potentially forcing Canada into a more expensive acquisition of new submarines

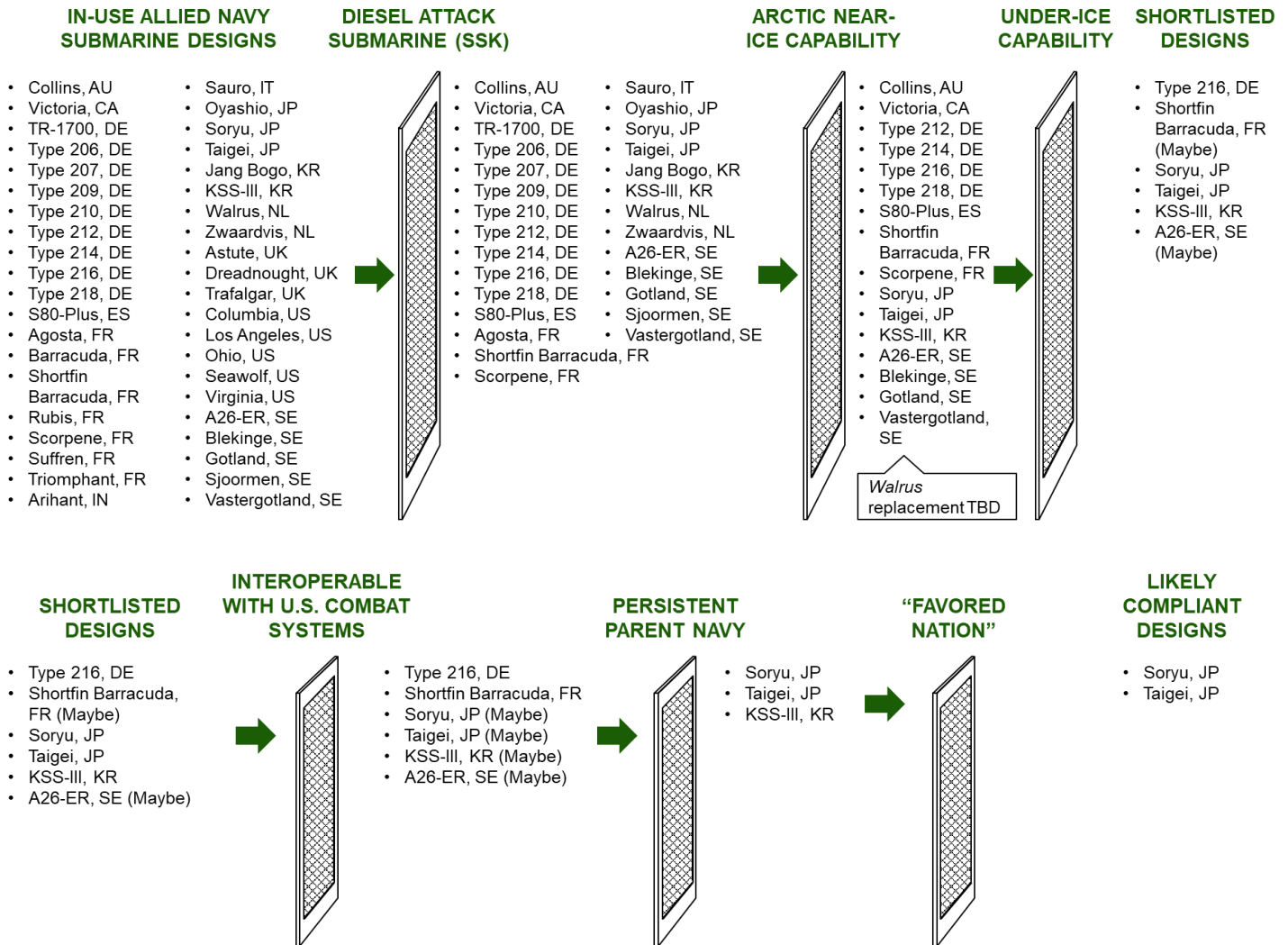


Figure 1. Comparison of 41 allied submarine designs with Canada’s potential requirements.

Conclusion

It is possible that the requirements that best meet Canada’s needs are a rare combination: few navies need to cover Canada’s extent of Arctic territory, and those that do (e.g., Russia, U.S.) choose to do so with nuclear, not diesel, submarines. Understanding the implication of requirements on available designs could help the Canadian Patrol Submarine Project optimize Canada’s capability needs, schedule requirements, and available budget. Conversely, setting requirements before understanding which existing designs are feasible could put Canada on the same path that Australia recently abandoned: a prohibitively expensive, bespoke, diesel submarine.

Photo credit: The Canadian Press

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About the Authors



Mr. Jones is the Managing Director of MW JONES & COMPANY. He has over 24 years of consulting experience specializing in strategy, growth initiatives and business transformation. He has worked with global Aerospace and Defense companies, as well as U.S. and international governments, to improve performance for air, sea, and space-based systems. Mr. Jones designs and leads multi-year projects for cost repositioning, market growth and post-merger integration strategies. As a leading expert in cost repositioning and value migration strategies, Mr. Jones works with CEOs and executive teams faced with volume disruptions or competitive pricing. Mr. Jones created the highly recognized “Design for Affordability” framework to dramatically improve affordability and bound total ownership costs for highly engineered products.



Mr. Holmander is an Industry Advisor for MW JONES & COMPANY, bringing over 40 years of experience in ship construction. John was previously Vice President of Operations at Electric Boat, responsible for Groton operations, nuclear and sub-base operations, test, ship’s management, facilities, and Quonset Point. Prior to Operations, John was the VIRGINIA-class Program Manager from November 2005 – May 2012, during which he led the successful Design-for-Affordability cost reduction program to drive down construction costs of Block III submarines, which resulted in increasing the VCS build rate to two boats per year. During his tenure as VIRGINIA-class Program Manager, John was responsible for the design and unique construction process involving teamed production between two major shipyards – Huntington Ingalls Industries Newport News Shipbuilding and General Dynamics Electric Boat.



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Prior to his last position, Hughes served as vice president for In-Service Aircraft Carriers and was responsible for planning and executing aircraft carrier refueling and overhaul programs at Newport News as well as carrier fleet support work around the globe. He began his career at Newport News Shipbuilding as a Combat Systems engineer in Aircraft Carrier and Nuclear Cruiser Engineering.



Mr. Miller is a Senior Associate at MW JONES & COMPANY. He has over 15 years of experience in aerospace and defense, including over 5 years as a management consultant. His project experiences span many industries, with a focus on highly engineered products in space, defense, and industrials. He started McKinsey & Company's Capture Excellence service line and has supported leading aerospace and defense firms across the business development lifecycle, from project formulation through execution. He has led government sales strategy, operations improvement, due diligence, and business cost restructuring projects. Prior to consulting, he led business development strategy for a veteran-owned engineering services firm.

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