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by Jeffrey F. Collins
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POLICY PAPER

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► Executive Summary

While both Canada and Australia share similar constitutional frameworks and imperial histories, they are also no stranger to procurement challenges. Cost overruns, delays, regionalism, and protracted intellectual property disputes have all been part of major defence acquisition projects in recent decades.

This Policy Paper analyzes the largest and most expensive procurement projects undertaken by either country, Canada's \$73 billion (estimated) National Shipbuilding Strategy (NSS), launched in 2010, and Australia's A\$90 billion Naval Shipbuilding Plan (NSP), launched in 2017. Each project represents an attempt to implement a rational, multi-decade approach to naval acquisition. Driven by a desire to overcome previous boom-and-bust cycles, the NSS and NSP aim to create a sustainable shipbuilding sector capable of meeting the immediate and future naval demands of Ottawa and Canberra. Neither country has attempted a shipbuilding plan on this scale before.

The NSS and NSP are still in their early stages but some common themes have emerged. On implementation challenges, old problems persist. For one, the rational approach to naval shipbuilding is not devoid of procurement politics and regionalism. Determining which province or state will be home to billions in contracts over many years remains a zero-sum game no matter how arms-length the process of yard selection.

Cost increases also remain a reality. Building domestically can carry a 30 per cent to 40 per cent premium. Project delays increase this premium, something Canada has already experienced when initial NSS acquisition costs, pegged at \$37.7 billion nearly a decade ago, jumped to an estimated \$73 billion today. Australia's delays in securing an agreement with France's Naval Group on its \$A50 billion future submarine project could mean additional cost increases.

In this context, schedule is king and avoiding cost increases requires keeping to planned shipbuilding schedules. Failure to do so opens production gaps and necessitates going with alternative options including building overseas (Australia) or converting commercial vessels for naval and coast guard use (Canada).

Prolonged cost sensitivities raise the consideration of trade-offs on committing more money to continuous shipbuilding at the expense of acquiring other military capabilities. Canada, for instance, will need to make decisions at some point on whether to spend billions on replacing the North Warning System in the country's North. Australia will have to grapple with an Indo-Pacific region proliferating with relatively cheaper but lethal anti-ship missiles. In this context, money spent on surface combatants may be perhaps better spent on other capabilities.

None of this is to say that progress has not occurred in either the NSS or NSP. Ships are getting built, including Arctic Offshore Patrol Ships in Canada, and Offshore Patrol Vessels in Australia.



In 2018, both countries selected the British Type-26 as their preferred design for a new generation of surface combatants. It is very possible that these respective strategies will achieve their goals of bypassing the boom-and-bust eras, but ongoing challenges serve as a reminder that even with the best-laid plans, naval shipbuilding is a complicated affair.¹

¹ The author would like to thank Andrew Pickford, Peter Layton and the comments of the two anonymous reviewers for their helpful feedback.



In Canadian eyes, Australian defence policy appears to be getting it right.² With seemingly bipartisan support on the country's security challenges and generous defence budgets to boot, the Australian Defence Forces (ADF) have spent the last decade or more purchasing maritime patrol aircraft, amphibious assault helicopter carriers and air warfare destroyers. That such projects are being acquired amid a constant turnover of people in the prime minister's chair makes the contrast with Canada's ever-constant drip of procurement woe headlines even starker.

But dig a little deeper and it becomes clear that Australia has seen its share of procurement challenges. The Seasprite helicopter – a close parallel to Canada's Sea King replacement saga – saw an A\$746 million plan to buy 11 used American helicopters balloon to A\$1.4 billion before being axed altogether in 2008 without ever a helicopter entering ADF service.³ Likewise, stories of competing political pressures, regionalism and demands for domestic offsets are no stranger to governments in Canberra either.⁴

With common military and diplomatic histories, first as British Dominions and, since 1945 as junior partners in American alliances, Canada and Australia are sometimes referred to as strategic cousins.⁵ Given their similar governmental systems these two countries present a unique case study in middle power defence procurement, especially as both occupy different geostrategic spaces. Canada, sitting securely atop the North American continent, enjoys a near-certain American security guarantee and rarely sees defence issues arise as a major domestic policy challenge. This can help account for Ottawa's laggard-like approach to both military funding and equipment replacement. In contrast, Australia is an island nation dependant on maritime trade and located in a more insecure part of the world, where a naval build-up among competing regional powers is a fact of life. Governments in Canberra have long had to prioritize defence to ensure that Australia has an independent capacity to act (known as self-reliance) and to maintain American security guarantees.⁶

However, as these two countries entered the 21st century they had to contend with the prospect of replacing numerous naval capabilities over the short to long term. Wanting to move past previous boom-and-bust shipbuilding cycles, both countries independently committed to pursuing national shipbuilding plans aimed at generating sustainable naval industrial bases while

² Matthew Fisher, "Lessons on National Defence from Down Under," *National Post*, Feb. 17, 2016: <https://nationalpost.com/opinion/matthew-fisher-lessons-on-national-defence-from-down-under>; David Krayden, "Canada's Fighter Jet Debacle: This is no Way to Run a Military," *National Post*, Oct. 3, 2018: <https://nationalpost.com/opinion/canadas-fighter-jet-debacle-this-is-no-way-to-run-a-military>

³ The A\$1.5 billion Tiger attack helicopters took seven years to reach final operating capability. See: Michael McGowan, "Buyer's Remorse: Australia's Sorry Record on Defence Hardware," *The Guardian*, Jan. 29, 2018: <https://www.theguardian.com/world/2018/jan/29/buyers-remorse-australias-sorry-record-on-defence-hardware>; Rory Callinan, "\$1.5Bn Tiger Choppers Grounded After Being Classed 'Unsafe'," *The Australian*, Aug. 14, 2017: <https://www.theaustralian.com.au/national-affairs/defence/15b-tiger-choppers-grounded-after-being-classed-unsafe/news-story/8767c445bd145c0bc23503eeb4b1ea3e>

⁴ Andrew Pickford and Jeffrey Collins, "Canada Can Only Learn So Much from Australian Defence Policy," Macdonald-Laurier Institute, March 3, 2016: <https://www.macdonaldlaurier.ca/canada-can-only-learn-so-much-from-australian-defence-policy-andrew-pickford-and-jeffrey-collins-for-inside-policy/>

⁵ For an overview of the historical comparisons between the two countries see, John C. Blaxland, *Strategic Cousins: Australian and Canadian Expeditionary Forces and the British and American Empires* (McGill-Queen's University Press: Montreal & Kingston, 2006).

⁶ Greg Raymond, "With China-US Tensions on the Rise, Does Australia Need a New Defence Strategy?" *The Conversation*, Nov. 21, 2018: <https://theconversation.com/with-china-us-tensions-on-the-rise-does-australia-need-a-new-defence-strategy-106515>



equipping their fleets with the vessels they need in a timely, cost-sensitive fashion. Under both Canada's National Shipbuilding Strategy (NSS), and Australia's Naval Shipbuilding Plan (NSP) tens of billions of dollars will be spent over several decades to acquire new maritime capabilities.⁷ Neither country has a historical parallel for such an undertaking and notably, the NSP has singled out Canada as a country for Australia to learn lessons from.⁸

While the NSS and NSP are still in their relatively early stages – the former having begun in 2010-2011, the latter in 2016-2017 – this paper contends that important insights can be gleaned from looking at how these procurement plans emerged, what they have achieved so far and what challenges they have encountered.

Canada's National Shipbuilding Strategy

Historical Context

The National Shipbuilding Strategy is a product of both recent and longstanding shipbuilding decisions. Since the Second World War federal vessels have been built domestically – the only exceptions being the more technically challenging submarines and, before 1970, aircraft carriers. The previous federal shipbuilding period in Canada occurred in the 1980s and 1990s when the navy received a dozen Halifax-class frigates, another dozen smaller Kingston-class Maritime Coastal Defence Vessels (MCDVs), and four modernized Iroquois-class destroyers.⁹ The political appeal of domestic shipbuilding was quite evident in the early 2000s when Jean Chrétien's Liberal government (1993-2003) recommitted to domestic shipbuilding. The 2001 *A New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry – Focusing on Opportunities*, mandated that shipbuilding, refits and modernization of naval and coast guard vessels be done domestically and that such projects be used as a means for stimulating national competition between shipyards.¹⁰ The Stephen Harper (2006-2015) Conservatives maintained this policy. *Focusing on Opportunities* was later encapsulated in the federal government's overarching procurement policy guidelines, the *Supply Manual*.¹¹

But it took a failure in 2008 to get beyond the stand-alone shipbuilding projects of yore to a national, multi-decade shipbuilding strategy. The Joint Support Ships (JSS) was supposed to replace the four decades-old Protecteur-class auxiliary oil replenishment ships (AORs) with an

⁷ The NSS was formerly known as the National Shipbuilding Procurement Strategy (NSPS) before the Justin Trudeau Liberal government changed it after coming to power in 2015.

⁸ Australia. Department of Defence. *Naval Shipbuilding Plan* (Canberra, 2017), 99.

⁹ Fears of antagonizing Quebec secessionists and intense industry pressure from Irving-owned Saint John Shipyard in New Brunswick and Quebec's Davie Shipyard saw the construction of the first batch of six frigates split between the two yards. That being said, the Canadian Patrol Frigate program is considered a major procurement success story. See: Canada. Department of National Defence, Chief Review Services, *Interdepartmental Review of the Canadian Patrol Frigate Project* (Ottawa: 1999): http://www.forces.gc.ca/assets/FORCES_Internet/docs/en/about-reports-pubs-audit-eval/framework-cadre.pdf

¹⁰ Canada, Industry Canada, *A New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry—Focusing on Opportunities*, 2001 (Ottawa: 2001): https://www.ic.gc.ca/eic/site/iccatt.nsf/eng/02982_5.html

¹¹ Jeffrey Collins, "Executive (In) Decision? Explaining Delays in Canada's Defence Procurement System, 2006-2015," (PhD diss., Carleton University, 2018), 78, 84-85.



entirely new class of ship that could both support the fleet with fuel and stores and have an amphibious capability to deliver and support troops on land.

But the JSS came undone for several reasons: Like all previous shipbuilding projects in Canada it was to be a one-off build. The JSS as envisioned and sanctioned in 2004 by the Paul Martin (2003-2006) Liberal government was too ambitious and outside the abilities of what the Canadian shipbuilding industry could do given the project's \$2.9 billion budget cap. Deep personnel cuts between 1989-1997 had erased much of the Department of National Defence's (DND) institutional memory on shipbuilding. Additional challenges came in the form of skyrocketing global shipbuilding material and labour costs of 200 per cent to 300 per cent, and inadequate shipyard infrastructure. Because of these reasons the first attempt at getting AOR replacements led to non-compliant bids. In fact, when the JSS was cancelled in August 2008, the Harper government cut the Canadian Coast Guard's (CCG) \$750 million Mid-Shore Patrol Vessel for largely the same reasons. The two JSS bidders meanwhile lost an estimated \$20 million to \$30 million on bid preparation.¹²

The Solution and Early Success

The JSS failure necessitated a rethink on the federal government's approach to domestic shipbuilding. Both DND and the CCG knew as far back as the early 2000s that a minimum of 30 ships was needed to replace both services' aging fleets over the coming decades. This presented an opportunity.¹³ An interdepartmental National Shipbuilding Procurement Office struck in 2008-2009 in the wake of the JSS cancellation recommended moving beyond the boom-and-bust history of Canadian shipbuilding to a continuous-build strategy that would help avoid the inevitable economic impact of closed shipyards and lost shipbuilding skills of the country's previous project-by-project efforts. The result is the National Shipbuilding Procurement Strategy (NSPS), launched in June 2010.

Informed by a best-practice review of allied naval shipbuilding programs, particularly in the U.K., the goals of the NSPS/NSS are threefold: (1) to equip the RCN and CCG with new vessels; (2) to revitalize and stabilize the shipbuilding industry; (3) and to "create jobs and generate economic benefits".¹⁴ Larger vessels over 1,000 tonnes were broken down into combat and non-combat packages, for which the initial acquisition cost was \$37.7 billion.¹⁵ Halifax-based Irving Shipbuilding Inc. and Vancouver-based Seaspan successfully competed for these packages in 2011. Irving won the largest of the two packages, that for combat ships, and will be building 15 new replacements for the Halifax-class frigates and the now-retired Iroquois-class destroyers, otherwise known as the Canadian Surface Combatant (CSC). In October 2018 the federal government selected a Lockheed Martin-led consortium using the British Type-26 design for the CSC build. The CSC project is estimated to cost up to \$60 billion and is the single largest, most

¹² Ibid., 86.

¹³ Ring, *The National Shipbuilding Procurement Strategy*, 2.

¹⁴ Canada, Public Services and Procurement Canada, *2016 National Shipbuilding Strategy: Annual Report* (Ottawa: 2017), 3.

¹⁵ Martin Auger, Library of Parliament, *The National Shipbuilding Procurement Strategy: A Five-Year Assessment* (Ottawa: 2015), 10.



expensive procurement in Canadian history.¹⁶ Work is not expected to begin on the CSC until the early 2020s.¹⁷ Irving is also building six Arctic and Offshore Patrol Ships (AOPS). In September 2018 the first of the \$3.5 billion Harry DeWolf-class AOPS was launched. A second and third ship are already under construction with a fourth set to begin work later this year.¹⁸

Seaspan's non-combat package includes the restarted JSS project (now reduced to two ships), the Polar Icebreaker and a series of CCG scientific, survey and patrol ships. The \$3.4 billion JSS, renamed as the Protecteur class, finally began construction in June 2018 with deliveries expected between 2022 and 2024.¹⁹ Work has already begun on the \$687 million Offshore Fisheries Science Vessels with the three ships expected to be delivered by the end of 2019. The actual cost of the remaining projects has been in flux but after the JSS are done, Seaspan will build the estimated \$1.3 billion Polar Icebreaker and a single \$331 million Offshore Oceanographic Science Vessel (to be completed in 2021-2022).²⁰ A 2013 contract for up to 10 additional CCG vessels, valued at \$3.3 billion, was also awarded to Seaspan although the details have been sparse on when work will begin.²¹

Beyond the combat and non-combat packages are contracts for smaller vessels (under 1,000 tonnes), refits and modernizations, and what the government refers to as "Other Marine Projects". Because they won the large vessel projects, Irving and Seaspan are unable to bid on small-vessel construction. Other yards in Canada have received contracts; for example, \$89 million worth of search-and-rescue lifeboats and \$5 million for channel survey and sounding vessels. Refits and modernizations are significant and expensive projects that can rival the building of new ships under the NSS. Everything from the Halifax-class frigates, Victoria-class submarines, icebreakers, MCDVs and auxiliary boats (tugs, barges) requires repairs and upgrades over the coming two decades.²² A new submarine in-service support contract set to begin in the mid-2020s will cost anywhere from \$1 billion to \$5 billion.²³ Of note, new submarines are not included in the NSS; this is a poignant issue considering that the Victorias will reach their end of operational life in the late 2030s.

¹⁶ Murray Brewster, "Lockheed Martin Selected as Preferred Designer for Canada's Next Generation of Warships," *CBC News*, Oct. 19, 2018: <https://www.cbc.ca/news/politics/frigate-designer-canada-defence-1.4869268>

¹⁷ Canada, National Defence and the Canadian Armed Forces, *Canadian Surface Combatant*, Oct. 25, 2018: <http://www.forces.gc.ca/en/business-equipment/canadian-surface-combatant.page>

¹⁸ Alex Cooke, "Sophie Grégoire Trudeau Officially Names First Arctic and Offshore Patrol Ship," *CBC News*, Oct. 5, 2018: <https://www.cbc.ca/news/canada/nova-scotia/arctic-offshore-patrol-ship-irving-hmcs-harry-dewolf-1.4853242>;

¹⁹ Canada, National Defence and the Canadian Armed Forces, "Minister Sajjan Marks the Start of Steel Cutting for the First Joint Support Ship," News Release, June 15, 2018: <https://www.canada.ca/en/department-national-defence/news/2018/06/minister-sajjan-marks-the-start-of-steel-cutting-for-the-first-joint-support-ship.html>

²⁰ Canada, Public Services and Procurement Canada, *Shipbuilding Projects to Equip the Royal Canadian Navy and the Canadian Coast Guard*, Oct. 19, 2018: <https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/mer-sea/sncn-nss/projets-projects-eng.html#s11>; Canada, Public Services and Procurement Canada, *Appendix—Status of Large Vessel Projects—National Shipbuilding Strategy: 2017 Annual Report*, Sept. 27, 2018: <http://www.tpsgc-pwgsc.gc.ca/app-acq/am-dp/mer-sea/sncn-nss/rapport-report-2017-6-eng.html>

²¹ Seaspan, "Vancouver Shipyards to Build Medium Endurance Multi-Tasked Vessels and Offshore Patrol Vessels for the Canadian Coast Guard," News Release, Oct. 7, 2013: <http://www.seaspan.com/vancouver-shipyards-build-medium-endurance-multi-tasked-vessels-offshore-patrol-vessels-canadian-coast-guard>

²² Canada, *2016 National Shipbuilding Strategy: Annual Report*, 12, 15-16.

²³ Canada, National Defence and the Canadian Armed Forces, "Victoria Class Submarine In-Service Support Contract II," *Defence Capabilities Blueprint*, May 30, 2018: <http://dgaapp.forces.gc.ca/en/defence-capabilities-blueprint/project-details.asp?id=1904>



The Challenges

Canada's NSS has encountered many challenges, the most significant of which are project cost estimations, shipyard production gaps, intellectual property negotiations, bid protests and communications. On cost estimates, most project budgets were set before the NSS was launched in 2010. The CSC was originally billed for \$26 billion but is now recognized as likely costing around \$60 billion. Other projects have seen their budgets marked for revision (e.g., the Polar Icebreaker) as succeeding delays subject budgets to inflationary pressures. Writing in 2018 for CGAI, retired rear admiral Ian Mack noted that all NSS projects are at least three to five years behind schedule.²⁴ In fact, as Dave Perry indicates, five NSS projects (AOPS, JSS, Polar Icebreaker, Offshore Fisheries Science Vessels and Offshore Oceanographic Science Vessel) slated by federal departments in 2012 for first delivery in 2017 have not come close to even meeting that goal.²⁵

It is true that the "uncertain, ambiguous interconnected global marketplace" can partly account for some of these escalating cost estimates but so can the lack of experienced naval procurement staff within government and industry, lost to cuts and yard layoffs in the 1990s, and, separately, shipyard start-up costs.²⁶ On the former, the Trudeau government has recognized this capacity gap and promised in its 2017 defence policy, *Strong, Secure, Engaged* to hire additional procurement staff.²⁷ Regarding the latter, getting the two NSS yards to meet the internationally benchmarked target state of productivity has proven difficult; simply put, rebuilding the country's shipbuilding sector required hiring and training a new skilled workforce and gaining the requisite management skills, plus upgrading yard infrastructure.²⁸

In Seaspan's case, the yard took two years (2012-2014) to generate additional sums needed for its upgrades and, separately, hire the necessary management and engineering expertise. A separate issue was modifying the German Berlin design selected for JSS to meet the smaller confines of the Vancouver yard. The design itself involved prolonged negotiations with German firm ThyssenKrupp Marine Systems (TKMS) over intellectual property as the Berlin, designed for operations in the Baltic Sea, required Canadianization changes to meet the Royal Canadian Navy's operational requirements. Likewise, determining whether the JSS took precedence over the CCG's Polar Icebreaker also consumed an estimated six to seven months before being resolved in 2013 (the JSS goes first).²⁹ Construction started five years later.³⁰

For Irving, recent progress on the AOPS in conjunction with delays on the CSC have seen an 18-month production gap emerge between the two projects. The Halifax yard claimed it needed orders for two more AOPS and maintenance contracts for the seven East Coast-based Halifax-class frigates or it would have to lay off its workforce. The claim also came amid speculation about

²⁴ Ian Mack, *A Basic Primer on Naval Shipbuilding*, Canadian Global Affairs Institute, 2018, 3.

²⁵ Dave Perry, "How is the National Shipbuilding Strategy Going?" *Canadian Naval Review*, vol. 13:4 (2018), 36.

²⁶ Mack, 2.

²⁷ Canada, National Defence and the Canadian Armed Forces, *Strong, Secure, Engaged: Canada's Defence Policy* (Ottawa: 2017).

²⁸ Mack, 11-12.

²⁹ Collins, 105-106, 108-109.

³⁰ Canada, Department of National Defence and the Canadian Armed Forces, *Joint Support Ship*, Dec. 11, 2018: <http://www.forces.gc.ca/en/business-equipment/joint-support-ship.page>



the Trudeau government splitting the Halifax work between Irving and its rival, Federal Fleet Services Ltd. in Davie, Quebec. In the end, the government opted for building a sixth AOPS stretched over two years, at double the cost, to ensure a bridging between the AOPS and CSC projects.³¹ In November 2018 the \$7 billion Halifax maintenance contract was split between Davie and Irving on the East Coast, and Seaspan on the West Coast, with work expected to begin in 2021.³²



Figure 1: A computer-generated image of a 'Canadianized' Type 26 Frigate. (Source: BAE)

After a succession of delays due to 88 specification and requirement changes, the CSC project hit another barrier in recent months following the selection of the Type-26 design. In October 2018 one of the two losing bidders, U.S. firm Alion, filed claims in both the Federal Court and the Canadian International Trade Tribunal (CITT) disputing the selection of the Type-26 on the grounds that it did not meet the project's requirements (e.g., speed). This resulted in the CITT ordering a pause to the CSC project, which has since been rescinded after the federal government convinced the Tribunal that the project was urgently needed.³³

Regionalism and shipbuilding are not new in Canada but have returned to the surface over the last three years following Federal Fleet Services' securing of a nearly \$700 million contract for an interim AOR ship, the converted commercial vessel MV Asterix, in the dying days of the Harper

³¹ David Pugliese, "Irving Shipbuilding Pushing for Two More Arctic/Offshore Patrol Ships, All Halifax-Class Work," *Ottawa Citizen*, Oct. 16, 2018: <https://ottawacitizen.com/news/national/defence-watch/irving-shipbuilding-pushing-for-two-more-arctic-offshore-patrol-ships-all-halifax-class-work>; David Pugliese, "Twice the Price and Just as Nice: Irving's Arctic Patrol Ship Double the Cost of Previous Five," *National Post*, Nov. 8, 2018: <https://nationalpost.com/news/canada/construction-of-sixth-arctic-patrol-ship-at-irving-shipbuilding-to-cost-800m-double-the-cost-of-the-other-five>

³² Kamila Hinkson, "Quebec's Davie Shipyard to Split Billion-Dollar Ship Maintenance Contracts," *CBC News*, Nov. 1, 2018: <https://www.cbc.ca/news/canada/montreal/davie-shipyard-contract-1.4887200>;

³³ Andrea Gunn, "Warship Contract Pause Lifted," *The Chronicle Herald*, Dec. 11, 2018: <https://www.thechronicleherald.ca/news/local/warship-contract-pause-lifted-267311/>



Conservatives in 2015. The contract has been the source of industrial squabbling, allegations of confidential leaks, and the role of federal partisan political calculations in both Quebec and Nova Scotia. The need to secure new icebreakers for the CCG's rapidly aging fleet, and prevent layoffs in the Davie yard, led to another contract for Federal Fleet Services; this time it was \$610 million for three commercial icebreakers to be converted to CCG use.³⁴

There is also the question of poor communications concerning the NSS's overall performance. Despite recognizing in its 2016 annual report on the NSS that there existed "insufficient communications with Canadians on the cost, timelines and progress of various builds", the promise of regular reporting and updates has not been acted on.³⁵ With nothing to counter the criticisms emanating from industry, opposition parties and media commentators, public support is at risk of being jeopardized.³⁶

Australia's Naval Shipbuilding Plan

Historical Context

Australia's Naval Shipbuilding Plan is largely the outcome of a 2015 RAND Corporation study born out of the experiences of acquiring the Collins-class submarines and the Hobart-class air warfare destroyers (AWD). Arguably, the more influential of the two projects, six Collins class were built in Australia and entered service between 1996 and 2003. At 3,100 tonnes apiece they are some of the largest diesel submarines operating today. Australia opted for building its own submarines in the 1980s after experiencing logistical challenges with its British-made Oberons (an experience not unlike Canada's British-built Victoria submarines). Being reliant on overseas sources for 85 per cent to 90 per cent of the Oberons' supplies increased refit costs to 76 per cent of the original purchase price. The vulnerability of relying on overseas sources became acute in the 1982 Falklands war when the Royal Navy suspended support temporarily. These factors, in conjunction with the confidence earned from installing a new submarine combat system and the possibility of jobs and high-technology transfers, led to government support for a made-in-Australia submarine in the 1980s.³⁷

The Collins class build did not go smoothly. The project ran into delays and cost overruns. A lack of submarine building knowhow led to unrealistic specifications, costing and scheduling. The absence of early-stage industry engagement made this situation even worse. Similarly, the alterations to the Swedish Västergötland design effectively created a new class of submarine, turning a supposedly proven off-the-shelf design into a developmental project. Once built, the

³⁴ CTV News, "\$610 Million Contract Awarded to Convert Icebreakers at Davie Shipyard," Aug. 10, 2018: <https://montreal.ctvnews.ca/610-million-contract-awarded-to-convert-icebreakers-at-davie-shipyard-1.4048440>

³⁵ Canada, 2016 *National Shipbuilding Strategy: Annual Report*, 6-7.

³⁶ Perry, 38.

³⁷ John F. Schank, Cesse Cameron Ip, Kristy N. Kamarck, Robert Murphy, Mark V. Arena, Frank W. Lacroix, and Gordon T. Lee, *Learning from Experience: Volume IV: Lessons from Australia's Collins Submarine Program* (Santa Monica, CA: RAND Corporation, 2011), 1, 4-5, 27; On Canada's start-up and support challenges with the Victorias please see, Canada, House of Commons, *Procurement of Canada's Victoria Class Submarines* (Ottawa: Standing Committee on National Defence and Veterans Affairs, 2005): <http://www.ourcommons.ca/Content/Committee/381/NDDN/Reports/RP1773092/nddnrp01/nddnrp01-e.pdf>



submarines themselves suffered from mechanical problems with their periscopes, communication masts, engines and propeller shafts. Failure to secure the rights to the Swedish design made it difficult for the Royal Australian Navy (RAN) to use the Collins for developing a future submarine.³⁸

The second project, the AWDs, began construction in 2012. Based on the Spanish F-100 design, two of the three ships have entered service, with the third expected in late 2019. Assembled in South Australia, the AWDs are A\$1.2 billion over budget and 2.5 years behind schedule. The project largely enjoyed political support from across the spectrum as it created “jobs in politically sensitive regions” and, secondarily, it gave the RAN access to local expertise in maintenance and upgrades. A major challenge with the AWD was its governance structure and the fact that Navantia was not involved in the project’s early stages; in fact, some of the ships’ blocks were built in Spain. There were also cultural misunderstandings, drawing errors, faulty pipework, initial unrealistic cost and schedule estimates, and much like Canada, challenges in restarting the domestic surface combatant shipbuilding.³⁹

Aware that the country would need to replace its Anzac frigates and Collins submarines in the near future, the Department of Defence (DOD) commissioned the RAND Corporation to outline what the country’s next steps should be. Critics have noted that in the A\$2.5 million report, RAND effectively made the case for “Soviet-style planning”.⁴⁰ Nevertheless, the influence of the 2015 report cannot be understated. It provided several options, including continuing the momentum of the AWDs and build domestically; building hull overseas and outfit in Australia (the Canberra class approach); and repetition of the Oberon model of buying an entire class of vessels overseas. The report eventually settled on the first option but with the caveat that Canberra pursue a multi-decade, continuous shipbuilding program. RAND reasoned that even with a 30 per cent to 40 per cent premium for building foreign designs domestically, Australia could drop this figure with steady production, a productive workforce and technology transfers.⁴¹ The report also recommended that an impending production gap between the AWDs and the new frigates be plugged with additional Offshore Patrol Vessels (OPVs), similar to an approach done in the U.K. and which was debated in Canada.⁴²

The Solution and Early Success

The RAND recommendations were incorporated into the 2016 Defence White Paper. The white paper promised three continuous builds equating to almost A\$90 billion for the Naval Shipbuilding Plan. Of the builds, one is for smaller vessels including A\$3 billion for 12 Offshore Patrol Vessels and A\$335 million for 21 Guardian-class patrol boats – the latter of which are to be

³⁸ Ibid., 6, 10, 12-13, 17-18, 21, 25, 28, 32-33, 36-37, 51.

³⁹ Robert Macklin, *Air Warfare Destroyer: The Game-Changer* (Canberra: Australian Strategic Policy Institute, 2018), 18, 23, 32-33, 39-40, 55, 58, 62, 71, 75.

⁴⁰ Mark Thomson, “Naval Deconstruction: RAND’s Shipbuilding Report,” *ASPI: The Strategist*, May 5, 2015: <https://www.aspistrategist.org.au/naval-deconstruction-rands-shipbuilding-report/>

⁴¹ John Birkler, John F. Schank, Mark V. Arena, Edward G. Keating, Joel B. Predd, James Black, Irina Elena Danescu, Dan Jenkins, James G. Kallimani, Gordon T. Lee, Roger Lough, Robert Murphy, David Nicholls, Giacomo Persi Paoli, Deborah Peetz, Brian Perkinson, Jerry M. Sollinger, Shane Tierney, and Obaid Younossi, *Australia’s Naval Shipbuilding Enterprise: Preparing for the 21st Century* (Santa Monica, CA: RAND Corporation, 2015), 140-149.

⁴² Thomson.



transferred to Pacific island countries via a regional security initiative. The biggest builds are A\$50 billion for 12 future submarines and A\$35 billion for nine future frigates. Another A\$1 billion has been allocated for shipyard upgrades and infrastructure. The NSP's goal is to create a sustainable shipbuilding sector and avoid the boom-and-bust cycles of the past;⁴³ it is, in short, to turn Australia from a "ship purchaser to a ship producer".⁴⁴



Figure 2: A panoramic image of the Osborne Naval Shipyard in South Australia. As the author notes, the bulk of production mandated through the NSP will take place at this facility. (Source: Wikimedia Commons)

Despite the emphasis on the national scope, the brunt of the construction work will take place at two locations, the government-owned ASC Pty Ltd yards in Osborne, South Australia and the Henderson Maritime Precinct, a common-user facility owned by the state of Western Australia, near Perth. Of the two yards, Osborne is getting the lion's share of NSP work, with both the future submarines and future frigate projects (A\$85 billion of the A\$90 billion plan). To avoid a production lull (and job losses) between the end of the AWDs and the start of the future frigates in 2020, Osborne will also build the first two OPVs; the remaining OPVs work will transition onto Henderson.⁴⁵ Other shipyards, like Williamstown, Victoria – where the Canberras were outfitted – are eligible for sustainment and refit contracts.

For a successful implementation the NSP will rely on four key enablers: (1) infrastructure upgrades; (2) developing a skilled workforce; (3) involving Australian states and territories; (4) and, considering that all the projects will rely on foreign designs, transferring intellectual property and shipbuilding design skills. Canberra has mandated that off-the-shelf, proven designs be used for its new vessels and that "the technology, intellectual property, business processes and workplace cultures" be transferred to Australia to ensure that a "sovereign" naval shipbuilding

⁴³ Australia, Department of Defence, *2016 Defence White Paper* (2016), 13; Australia, *Naval Shipbuilding Plan*, 39. The program is known as the Pacific Maritime Security Program.

⁴⁴ Peter Layton, "Australia's Grand Naval Shipbuilding Plan," *Defence Today*, September 2017, 1-5.

⁴⁵ Australia, *2016 Defence White Paper*, 21, 113-114.



base takes root. This transfer of knowledge and technology is seen as vital to ensuring that the future continuous builds are possible and a response to past mistakes.⁴⁶

Even before the NSP was officially announced in May 2017 work had already begun on a number of the projects. A contract was awarded to the firm Austal in May 2016 for the Guardian patrol boats, the first of which was launched in May 2018. The remainder will be delivered by 2023.⁴⁷ The future submarine project deviated from a possible off-the-shelf buy of the Japanese Sōryū by then-prime minister Toby Abbott (2013-2015) to a competition between the Japanese government, French firm DCNS (now Naval Group), and Germany's TKMS. In April 2016, DCNS's shortfin diesel version of its nuclear Barracuda was selected and in December of that year, a co-operation agreement between France and Australia was formally signed, setting the path for negotiations over design changes and offsets.

The future frigate program, which will replace the eight Anzac frigates procured in the 1990s and early 2000s, announced a successful design in June 2018, BAE's Type-26, the same design selected for Canada's CSC project. Now named the Hunter class, the Type-26 was selected primarily for its anti-submarine warfare capability, something seen as vital for Australian decision-makers as they contend with an Asian-Pacific naval arms build-up. Last, German firm Lürssen received the OPV contract in January 2018 and has already begun work on the first two ships at Osborne Naval Shipyard before moving production on the remaining 10 ships in 2020 to Henderson Maritime Precinct.⁴⁸

The Challenges

Despite being the younger of the two countries' shipbuilding strategies, the NSP has already encountered problems and criticisms, key of which was a 2018 report by the Australian National Audit Office (ANAO) – the equivalent of Canada's Office of the Auditor General. The report characterized the NSP as an "extreme risk". The ANAO noted that the DOD had not updated its cost assumptions from the 2016 white paper on either the submarines or frigates even though recent government decisions on building the Barracuda subs in Australia and equipping the new frigates and the Aegis BMD system will entail significant design changes. Likewise, the ANAO viewed the NSP's governance structure as not being firmly in place, even though work has begun. The push to begin work on the OPVs so as to bridge the gap between the AWDs and the frigates means that sustainment costs remain uncertain and commercial agreements between the builders and suppliers have not been settled.⁴⁹

The feasibility of the NSP remains a concern as well. The plan, for instance, does not provide for in-service support costs nor is it clear that domestic industry will have access to the design information required for upgrading the combat and sensor systems, thereby repeating the

⁴⁶ Australia, *Naval Shipbuilding Plan*, 11-12, 17, 19, 21, 25-27, 64.

⁴⁷ "First Guardian-Class PPB-R Launched for Delivery to Papua New Guinea," *Naval Technology*, May 31, 2018: <https://www.naval-technology.com/news/first-guardian-class-ppb-r-launched-delivery-papua-new-guinea/>

⁴⁸ *NavalToday.Com*, "Australia Signs Offshore Patrol Vessel Construction Contract with Lürssen," Jan. 31, 2018: <https://navaltoday.com/2018/01/31/australia-signs-offshore-patrol-vessel-construction-contract-with-lurssen/>

⁴⁹ Australia, Australian National Audit Office, *Naval Construction Programs – Mobilisation* (ANAO Report No. 39, 2017-18), 9, 11.



problems of the Collins class.⁵⁰ Others have pointed out that Australia's domestic steel industry lacks the capacity to produce the 1,800 tonnes of steel needed for each submarine, further contributing to cost escalation.⁵¹ Doubts persist on whether Australia should even be in the business of building large platforms and resources better spent on supporting the country's high-tech, niche defence suppliers.⁵² It was telling that in 2016 a A\$1 billion contract for two new supply ships was placed with Spanish firm Navantia on the grounds that they could be delivered 12-24 months earlier and cheaper than if built domestically.⁵³

Problems have also emerged in advancing the submarine project. Negotiations on a strategic partnering agreement with the French state-owned majority firm Naval Group have hit a roadblock over Australia's requirements for technology transfer, intellectual property and warranties. The current impasse has attracted partisan attacks with the opposition Labour Party claiming, should it win government in 2019, that it may review the project if the dispute is not resolved.⁵⁴ Adding another layer of complexity to the mix has been the intervention of the Japanese government, claiming that if negotiations with Naval Group fail, Japan will co-develop and build subs in Australia, including additional subs for the Japan Maritime Self-Defense Force.⁵⁵ The likelihood of submarine construction delays is forcing the RAN to contemplate operating the Collins subs well into the 2040s;⁵⁶ this is expected to involve going beyond the planned A\$6.7 billion set aside for sustaining the Collins subs to the late 2030s.

Finally, allegations of regionalism have not dissipated either. A Labour-led government in Victoria, whose Williamstown Dockyard outfitted the A\$3 billion Canberra-class amphibious assault helicopter carriers, accused the prime minister in 2017 of snubbing the state from NSP contracts in favour of garnering votes in South Australia and Western Australia. The premier demanded that Victoria get its "fair share" of the contracts.⁵⁷ Nor has it been lost on political observers that the NSP's ambition and timing seemed to coincide with the governing coalition's concern over "electoral vulnerabilities in South Australia" (especially in light of the impending

⁵⁰ Graeme Dunk, "\$89B Shipbuilding Plan is a Major Step Forward – But Sovereignty Remains a Problem," *The Conversation*, May 18, 2017: <https://theconversation.com/89b-shipbuilding-plan-is-a-major-step-forward-but-sovereignty-remains-a-problem-77865>

⁵¹ Brendan Nicholson, "The Long, Stealthy Voyage has Begun," *Australian Defence Magazine*, May 18, 2018: <http://www.australiandefence.com.au/defence-suppliers-news/brent-clark-the-long-stealthy-voyage-has-begun>

⁵² Andrew Tillett, "Frigate Program Decision Crucial for Local Industry and Government Policy," *Financial Review*, March 26, 2018: <https://www.afr.com/news/special-reports/afr-focus-defence/afrmar26fsrdefence-leadfocus-special-report--20180320-h0xr0b>

⁵³ David Pugliese, "Australia Decides to have its Supply Ships Built Overseas – Vessels Needed Urgently says Government," *Ottawa Citizen*, May 7, 2016: <https://ottawacitizen.com/news/national/defence-watch/australia-decides-to-have-its-supply-ships-built-overseas-vessels-needed-urgently-says-government>

⁵⁴ Andrew Greene, "Future Submarine Project Deadlocked as French Shipbuilder Digs In on \$50 Billion Contract," *ABC News (Online)*, Sept. 27, 2018: <https://www.abc.net.au/news/2018-09-28/future-submarine-project-deadlocked-french-shipbuilder-digs-in/10311294>

⁵⁵ Franz-Stefan Gady, "Japan Offers to Build Australia's \$50 Billion Submarine Fleet If French Deal Falls Through," *The Diplomat*, Oct. 11, 2018: <https://thediplomat.com/2018/10/japan-offers-to-build-australias-50-billion-submarine-fleet-if-french-deal-falls-through/>

⁵⁶ Paul Maley, "Collins-Class Subs Poised to Fill the Gap Left by Construction Delays," *The Australian*, Oct. 1, 2018: <https://www.theaustralian.com.au/national-affairs/defence/collinsclass-subs-poised-to-fill-the-gap-left-by-construction-delays/news-story/f62b9f1ad3d2a518192a5b675d03bc94>

⁵⁷ "Shipbuilding Plan Leaves Williamstown Shipyard on Brink of Closure: Victorian Government," *ABC News (Online)*, May 15, 2017; Annika Smethurst, "Williamstown Shipyard Bracing for Job Cuts after Warship Snub," *Herald Sun*, April 19, 2016: <https://www.heraldsun.com.au/news/victoria/williamstown-shipyard-bracing-for-job-cuts-after-warship-snob/news-story/3a7612d393b0d2cedace700b6ef6f374>



closure of the country's last car plant) and the need to boost "its flagging political fortunes" in both that state and Western Australia in anticipation of the 2019 federal election.⁵⁸

Analysis: "Go Big or Go Home?"

Canada and Australia are still in the early stages of their national shipbuilding plans. Despite challenges in start-up costs, hiring and establishing shipyard infrastructure, both countries have started to see progress made; however, certain themes have also emerged reflecting the challenges of effective long-term implementation. For one, the rational approach to naval shipbuilding is not devoid of procurement politics and regionalism. Determining which province or state will be home to billions in contracts over many years remains a zero-sum game no matter how arms-length the process of yard selection. The clamour for a province's or state's fair share of shipbuilding dollars will not dissipate, especially when delays begin mounting in those selected yards and/or when existing capabilities begin aging out.

Still, for the time being, domestic shipbuilding remains an attractive defence industrial policy in both countries. The production of other big ticket defence platforms like fighter jets (either indigenously or under licence) has long been abandoned in Canada and Australia and yet successive governments across party lines have remained committed to undertaking ambitious shipbuilding projects. The likely explanation lies in the ability of the NSS and NSP to offer governments the ability to do highly visible multi-year projects that employ thousands of people, and spend large sums of money using largely existing shipyards without being too susceptible to the pressures of export sales to justify public expenditures.

International trade agreements permit deviation away from prohibitions on protectionist policies on the grounds of national security; as such, shipbuilding industrial policies are an accepted international norm.⁵⁹ Close allies like Denmark, the Netherlands, France, Italy, Spain and the U.K. all pursue domestic shipbuilding programs.⁶⁰ Sending such large sums of money to overseas yards can make for bad politics and it opens a governing party up to pressure from provinces, industry, labour and opposition parties.

There is also a sovereignty calculation at play. As Australia and Canada experienced with overseas submarine purchases, foreign builds bring problems in obtaining spare parts and maintenance support. At a minimum, domestic shipbuilding provides a means to develop domestic supply chains and, crucially, local expertise in the maintenance and refit of vessels. Likewise, it's not always clear in the long term how much cheaper building ships overseas is when intellectual property transfer costs and overseas in-service support are factored in. Altering foreign designs

⁵⁸ Editorial, "Huge Navy Shipbuilding Plan to Shore up Malcolm Turnbull's Sinking Prospects," *The Age*, May 17, 2017: <https://www.theage.com.au/national/victoria/huge-navy-shipbuilding-plan-to-shore-up-malcolm-turnbulls-sinking-prospects-20170517-gw6y0a.html>

⁵⁹ Tom Ring, "The National Shipbuilding Procurement Strategy: How Did We Get to Where We are Now?" Canadian Global Affairs Institute, 2016, 2.

⁶⁰ For an overview see, Jeffrey F. Collins, "Review Article: The Decline of European Navies: Lessons for Canada?" *Canadian Naval Review*, vol. 14 (2) (2018), 17-22.



to meet RAN and RCN needs is a given, and if the money is going to be paid, at the very least a domestic build carries the bonus of stimulating local industry and generating expertise in highly skilled advanced manufacturing.

Moreover, with the brunt of the NSS and NSP dollars going to one yard in each country, there is a risk of fostering a powerful constituency that may make it hard to maintain flexible policy options (witness the dispute among Irving, Federal Fleet and Ottawa over Halifax class maintenance contracts). At the same time, such a constituency may prove useful in incentivizing government decision-making. Either way, this will prove to be a headache for naval planners and government decision-makers alike.

However, even with a focus on jobs and industrial rejuvenation, cost increases are a reality. As Australia's 2015 RAND report noted, building domestically can carry a 30 per cent to 40 per cent premium. Project delays increase this premium, something Canada has already experienced when initial NSS acquisition costs, pegged at \$37.7 billion nearly a decade ago, jumped to an estimated \$73 billion. Similarly, Australia's delays in securing an agreement with Naval Group on its \$A50 billion future submarine project could mean additional cost increases. In this context, in both the NSS and the NSP, schedule is king.⁶¹

Avoiding cost increases requires keeping to planned shipbuilding schedules. Failure to do so opens production gaps and necessitates that Ottawa and Canberra consider alternative options. In Canada this has meant turning to contracting a non-NSS yard to convert commercial vessels for naval and coast guard use and purchasing a sixth AOPS, respectively. In Australia, the Navantia yard in Spain was hired in 2016 to build two supply ships rather than risk building them at home.

Given such cost sensitivities there may come a time when both countries need to consider what the trade-offs are between committing more money to continuous shipbuilding at the expense of acquiring other military capabilities. Canada, for instance, will need to make decisions at some point on whether to spend billions on replacing the North Warning System in the country's North and, separately, its four Victoria submarines – none of which is funded for in the 2017 defence policy, *Strong, Secure, Engaged*. Australia, living in a more uncertain geopolitical environment, will have to grapple with an Indo-Pacific region proliferating with relatively cheaper but lethal anti-ship missiles. In this context, money spent on nine surface combatants or 12 submarines may be perhaps better spent on other capabilities.⁶²

None of this is to say that progress has not occurred in either the NSS or NSP – after all, ships are getting built, or that these respective strategies will not achieve their goals of bypassing the boom-and-bust eras. They are, though, a reminder that even with the best-laid plans, naval shipbuilding is complicated.

⁶¹ Mack, 4.

⁶² Andrew Davies, "Shipbuilding—Making it Up as We Go Along," *ASPI: The Strategist*, May 18, 2018: <https://www.aspistrategist.org.au/shipbuilding-making-it-up-as-we-go-along/>



Appendix A – Key NSS Projects

Name	Yard	Acquisition Cost	Delivery
Arctic and Offshore Patrol Ships (AOPS)	Halifax, NS	6 ships - \$4.3 billion	2019-2025
Canadian Surface Combatants	Halifax, NS	15 ships - ~\$60 billion	Mid-2020s to 2030s
Joint Support Ships	Vancouver, BC	2 ships - \$3.4 billion	Late 2022 to early 2023
Polar Icebreaker	Vancouver, BC	1 ship - \$1.3 billion (budget under review)	2025-2030 (timeline under review)
Offshore Fisheries Science Vessels	Vancouver, BC	3 ships - \$687 million	End of 2019
Offshore Oceanographic Science Vessel	Vancouver, BC	1 ship - \$331 million (budget under review)	Late 2021 to early 2022
Medium Endurance Multi-Tasked Vessels/Offshore Patrol Vessels	Vancouver, BC	Up to 10 ships - \$3.3 billion	Unknown.



Appendix B – Key NSP Projects

Name	Yard	Acquisition Cost	Delivery
Future Submarine (SEA 1000)	Osborne, SA	12 submarines for A\$50 billion	Early 2030s to 2050
Future Frigate (SEA 5000)	Osborne, SA	9 frigates for A\$35 billion	First ship to be delivered in late 2020s
Offshore Patrol Vessel (SEA 1180)	Split between Henderson Maritime Precinct, WA and Osborne, SA	12 OPVs for A\$3 billion	First ship to enter service in 2021
Pacific Patrol Boats (SEA 3036)	Henderson Maritime Precinct, WA	21 boats for A\$335	2018 to 2023

► About the Author

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Jeff's research interests are in defence procurement, missile defence, Canadian and Australian defence policy and the Arctic. He has spoken and published widely in these areas and is the co-editor of the book, "Reassessing the Revolution in Military Affairs" (Palgrave Macmillan 2015). A new book, "Canada's Defence Procurement Woes" (Palgrave Macmillan), is due out in 2019.

A proud east coaster, Jeff hails from Newfoundland but now resides in Prince Edward Island.

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