



CANADIAN GLOBAL AFFAIRS INSTITUTE
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Another Way to Buy Frigates

by Ian Mack
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POLICY PERSPECTIVE

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It is rare that a senior government executive can participate in the details of two nations' processes executed in the same time frame to select a warship design for subsequent modification and construction. One is able to compare the different approaches and develop perspectives that are rarely achieved through periodic briefings and the high-level exchange of information.

From 2007 until just after the release of the Request for Proposals (RfP), I was involved in the development of the Canadian Surface Combatant (CSC) project. Actually, this project was underway as the Destroyer Replacement Project when I first became involved, but evolved into the CSC project with its formal announcement in the *Canada First Defence Strategy* in 2008. The project received funding around 2013 as it passed through the first Treasury Board approval gate to launch the project definition phase. The preferred bidder to deliver CSC was selected in October 2019, almost two years to the day of the RfP release, and awarded a contract in February 2019.

In early 2017, I was privileged to be one of four people selected by the Australian government to join an international expert advisory panel to provide a degree of advice and oversight for the Future Frigate Program (FFP) as it implemented its competitive evaluation process. Essentially, this project was first announced in 2009 and received initial government approval to proceed in 2015. The Request for Tender (RfT) was released in 2017 and closed later that year, which was more or less the period of my involvement with the project. The announcement of the winning bidder occurred in late June 2018.

This paper will identify the strategic context of each of the two projects and then focus on observations of the Australian competitive evaluation process as compared to that used in the CSC procurement activity.

At the outset, I must recognize Paddy Fitzpatrick of the Australian Department of Defence and the support of key members of his team, without whom this paper would not have been possible. And as I have stated before elsewhere, I am not a contracting expert and beg the forgiveness of those who are, for those nuances that I have misrepresented.

Strategic Context Differences

Canada

As the first of three points, I have previously stated my perspective that Canada has generally been a secure nation, one relying on the U.S. and NATO as its guarantors for defence. Canada has never been territorially threatened during any major conflict. Therefore, the work of Canada's Department of Defence has been somewhat undervalued by Canadians and by the federal government. Perhaps this is best demonstrated by the fact that the last proper and comprehensive white paper on defence was published in 1994, with one strategy and one policy statement since that time, which were focused more on investment planning than on a fulsome development based on a published threat analysis.



The second major strategic point relates to Canada's 21st century shipbuilding strategy. As a result of terminated procurement processes for both Canadian Coast Guard and Royal Canadian Navy vessels in 2008, the government launched the National Shipbuilding Procurement Strategy (NSPS) in 2010 to competitively select two Canadian shipyards with whom to establish long-term strategic relationships. Vancouver Shipyard and Irving Shipbuilding in Halifax were successful. Each shipyard signed agreements in 2012 by which they agreed to recapitalize their facilities to a government-prescribed standard and at their own expense, with an expectation of receiving a number of contracts to build specified ships for each client. Of relevance to this paper, the CSC project as announced would deliver 15 warships to replace the Tribal class of destroyers and the Halifax class of frigates. CSC would be the second ship design and construction procurement for Irving Shipbuilding, following the delivery of six Arctic Offshore Patrol Vessels (since amended to eight). To date, the shipyards have been assigned as prime contractors for the ship projects since funded, including the CSC. It is noteworthy then that the prime contractor (Irving Shipbuilding) was already in place with fully updated facilities before work was started in earnest on the RfP for the CSC project.

The third point is that Canada, uniquely among its allies, has multiple government departments and central agencies significantly involved in the minutiae of its major military procurement projects. Generally, the Department of Defence sets the operational and technical requirements, and then secures the funds from the Treasury Board (and essentially, the Finance Department as well). Public Services and Procurement Canada is responsible for all commercial aspects of contracting (plus fairness and probity), in collaboration with the Department of Justice whose lawyers play major roles in developing and executing such contracts. Innovation, Science and Economic Development Canada addresses the Canadian content requirements of all such procurements to achieve economic benefits for the nation's industries. Other organizations and departments are also stakeholders and able to inject important additional considerations. The ministers for each of these portfolios have quite different mandates, such that horizontal co-operation and engagement are critical to achieving agreement for all strategic project decisions.

Australia

Geopolitically, Australia is situated in a much more dangerous part of the world, having seen direct threats in the Second World War. The 2016 white paper is the last of three since the turn of the century, which identified the modernization of defence forces in the Indo-Pacific and in China as potential threats to peace and security in Southeast Asia and thus to Australian trade. It also highlights a second strategic objective regarding strengthening the security of Papua New Guinea, Timor-Leste and other Pacific island countries. Based on comments by the minister of Defence in October 2016, the government committed AU\$195 billion over 10 years to defence to ensure that the nation remained a regional power to deal with instability in its part of the world.

The 2009 white paper announced the FFP, which was to acquire nine frigates to replace the Anzac class of frigates. However, in 2014, the schedule was brought forward by three years. Then, in preparation for the 2016 white paper, the Australian government commissioned RAND to consider the options of domestic ship construction and purchase offshore – the standard “make or buy” decision, albeit a complex one. Based on the RAND study, a continuous shipbuilding strategy was adopted, with the subsequent publication in 2017 of the Naval Shipbuilding Plan (NSP). The FFP is a cornerstone of this continuous shipbuilding strategy, with the nine frigates to be constructed in upgraded facilities at the government-owned Osborne Naval Shipyard near Adelaide in South Australia. Specifically, the shipyard is owned by Australian Naval Infrastructure, a joint government-business enterprise of the departments of Finance and



Defence. Facility upgrades were scheduled to be completed at the Australian government's expense and available for use by 2020. The intent was that the winning bidder for the FFP would also be responsible for the operation and the surface ship workforce of the shipyard, such that full production of the first frigate was to commence in 2020 (subsequently delayed to 2022). However, this operator of the shipyard would be offered no indication that its mandate would continue beyond delivery of the last frigate. Of importance and in addition to the capability to build the frigates, it was intended that the FFP (now renamed the Hunter Class Frigate Program) would also create a legacy domestic frigate design and construction capability, while growing the Australian industrial supplier community concurrently.

The Department of Defence is accountable for all aspects of planning and executing the navy's shipbuilding activities. Specifically, one minister has responsibility for the operational and technical requirements, securing the funds, contracting and developing an Australian industry capability plan to ensure domestic benefits and the legal aspects of procurement. Expert personnel responsible for all such functions report directly to the project director (equivalent to the project manager in Canada), with only a probity advisor reporting elsewhere in the Department of Defence (roughly responsible for the same activities as Canada's fairness monitor).

Context Summary

Both countries have embarked on strategies to break the boom-and-bust cycle of shipbuilding with the intent to achieve continual-to-continuous shipbuilding. However, the strategic importance to each nation's government of these enterprises, the details of the shipbuilding strategies and the resulting ships, and the accountability for execution of each project are very different. In terms of the latter point, the pre-selection of Irving Shipbuilding as the prime contractor for CSC influenced the Canadian competitive sourcing activity in appropriate and beneficial ways. Therefore, one must acknowledge a cautionary note at the outset relating to the applicability for Canada of all aspects of the Australian approach to acquiring warships.

Observations on Australia's Future Frigate Procurement Approach

The approach used to select the contractor responsible for the design and construction of the nine frigates is a fit-for-purpose competitive evaluation process (CEP). CEPs are designed to be tailored as appropriate for each shipbuilding project. The Australian National Audit Office Report No. 48 of 2016-2017, "Future Submarine – Competitive Evaluation", says that a CEP "comprises an evaluation of two or more options under a common evaluation framework ... (that) would address a range of criteria, which could include matters such as capability, interoperability, cost, schedule and commercial issues".

The tailored CEP was designed for the FFP after the government decided in 2015 to shortlist three foreign shipbuilders and specific ship designs to compete for the project as prime contractor: BAE Systems with the Type 26 frigate, Fincantieri with the FREMM frigate and Navantia with a redesigned F100. The project office was responsible for designing and obtaining approval of a CEP. More than half the office staff were experts on contract from multiple companies so that project office capacity requirements could satisfy the project's accelerated schedule.



Risk Reduction

After each of the three had accepted an invitation to participate, the CEP essentially pursued a multiphase risk-reduction approach with the following characteristics:

- A funded risk-reduction activity was launched soon after the down-select announcement. This enabled participants to conduct studies desired by the government and to address aspects of their parent warship designs. The related contracts were in place prior to the release of the RfT and during the period that it was active, which was just under one year.
- The RfT was released to each of the participants and required responses within five months of receipt. As usual, formal questions for clarification were pursued with participants based on their formal RfT responses.
- A funded schedule protection activity followed the end of the risk-reduction activity to allow participants to continue preparations for their potential selection as the successful bidder. These contracts were also unique and included statements of work shaped by each participant. This activity ended when the Australian government announced the results of the CEP, a year after the start of the schedule production activity.
- Based on evaluation of the responses to the RfT, the project office could also ask more probing questions of one or more of the participants under an offer-definition activity before the government's decision and announcement.

In addition to these activities, the project office engaged the participants throughout the process. This included structured sessions with each of the three participants while the RfT was open for such things as explanation by the project office, questions requiring clarification from participants and likely themes about the intended responses from participants. A probity advisor carefully monitored and guided these engagements.

The probity advisor was also key to managing risk by providing oversight to ensure that the CEP probity plan was executed. The plan addressed such things as fair and equitable treatment of participants, ethical conduct, and compliance with regulatory requirements, confidentiality and conflicts of interest. The probity advisor was unique in that he reported outside of the project office. Australian information indicates that a probity advisor is actively involved in providing advice on probity issues which may arise, together with advice on strategies to overcome potential problems. Furthermore, the probity advisor's pro-active approach is meant to help achieve best-practice procurement processes and outcomes. The probity advisor's penultimate objective is to advise the minister of Defence in due course that the CEP has been conducted in accordance with the probity plan and without breaches.

Finally, the expert advisory panel was established to provide assurance through observation that the CEP was carried out as per the planning documents. As well, there were occasions when advice was sought. This panel was entirely independent of the Australian government. The panel was comprised of four foreign advisors with relevant naval shipbuilding experience and included the author of this paper.



Tenders and Evaluation of Responses from Bidders

As with most competitive procurements, the RfT (in Canada, termed Request for Proposals – RfP) was the primary assessment phase of the CEP. It too was very much designed as fit for purpose and aligned to the intended evaluation approach.

The CEP focused on assessing the bidders' RfT responses based on a handful of key objectives established by the Australian government. These included the things one would expect in all such sourcing documents (e.g., the frigates as artifacts, schedule compliance, the affordability of the proposal and the degree of use/growth of Australian industry) and other aspects of uniqueness, such as support to Australia's NSP. These objectives were then expanded into about twice as many major assessment areas. Based on multiple evaluation criteria for each of the assessment areas, the RfT posed questions that enabled the answers provided to be evaluated in terms of the risks inherent in each bidder's responses. And as is the norm in bid evaluations, there was a detailed methodology developed to guide the evaluators in a typical technical evaluation organization, all documented as a tender evaluation plan.

Notwithstanding this fairly standard approach, many attributes stood out:

- Key elements of the RfT were not socialized for feedback with the bidding participants before it was released.
- The RfT included a draft head contract and an expectation of compliance so as to minimize negotiations with the preferred bidder. The head contract generally addressed the management aspects of the contract execution and acted as a sort of umbrella agreement to guide the work required. From a contract structure perspective, negotiated work scope packages would be added to the head contract for such things as design, facility and production testing, long lead items, and construction of each batch of three ships. Although no scopes of work were released with the head contract, a general statement of requirements indicated that an initial scope would be executed with the head contract and subsequent scopes of work would be added over time using an amendment process. Further, the project office would work with the winning bidder to agree on the initial and subsequent scopes of work. Also important was the fact that, aside from signing up to the head contract, accommodating government-directed equipment fits (i.e., a domestic radar) and answering all sections of the RfT, no other mandatory technical requirements were specified – all three candidate ships having been assessed as acceptable with minimal change when short-listed.
- The evaluation plan had to contend with a significant number of uncertainties. The project office was comfortable in addressing unknowns, allowing bidders to set and explain their own assumptions in their bid responses. This meant that each bidder might make very different assumptions that could significantly shape their intended solutions, but still allow evaluation in terms of the risk of satisfying the key project objectives.
- Aside from the identification of major project objectives and the assessment areas requiring bidder responses, the evaluation methodology was not provided to bidders in the RfT or otherwise. In fact, the details of the evaluation methodology only had to be finalized before the RfT closed.



- As is typical in such contracts, domestic Australian industry benefits were an important part of the project's mandate. However, there was a stated requirement in the RfT that employment of Australian industry should not compromise performance, schedule or overall affordability. Notwithstanding, a progressive plan to develop industrial capability over the project's life was required. In this regard, bidders could anticipate that industries they targeted could capitalize on support from a newly formed government-funded Centre for Defence Industry Capability and/or from access to a government innovation program. Also noteworthy was the absence of detailed rules which identified such things as the percentage of Australian content required to qualify as an Australian industry company and product for use in the frigates. Finally, such Australian industry contributions had to be of value to the Royal Australian Navy in particular to be considered.
- Bid responses were required to include an executive summary, with an understanding that such could include multimedia and that government may request participants to present in person.
- To address affordability, exceptionally detailed costing data were required on all aspects of each proposal, with objective evidence to allow evaluators to assign a confidence factor when assessing it. The methodology was very advanced and tested by participants before bid response to ensure understanding.
- Milestone-based, cost-plus, fixed-price, fixed-fee and incentive-based payment schemes were established for varying aspects of the intended statements of work.
- Weekly penalties were specified for late delivery against milestones, placing a high priority on schedule. However, contractual commitment to delivery dates for ships would only be set as agreed with each build scope. That said, the drumbeat for ship production was quite generous at two years between the commencements of build for each of the frigates. This was stipulated to ensure that the requirement of continuous shipbuilding would be met.
- One area of deviation to hard milestones involved cost-plus work where there understandably were no prescribed hard schedule milestones or ceiling prices. However, very significant securities for the government were stipulated to ensure that the contractor was highly motivated to finish the project and on time, or risk the government stepping in to finish the job at the prime contractor's expense.
- The approach to such things as intellectual property, insurance and liabilities was novel. No minimum thresholds were identified, but the government's desired levels were articulated. Bidders were left to interpret these as "floors" or "ceilings" as they wished, recognizing that they would be evaluated against the project's desires.

A number of other characteristics of the RfT and the environment are worth highlighting:

- The project office was required to produce an evaluation report to government which was devoid of bid ranking based on evaluation. Therefore, there was no scoring of responses or comparative analyses. Rather, the report provided a global assessment for each objective and for each participant. This report was one of the key inputs – but only one – to the government's decision regarding the selection of a preferred bidder.



- Notwithstanding the fact that the bidders had no detail or clarity regarding how their bid responses would be evaluated, the three participants appeared to have no concerns about the process or that they would be treated fairly. This may be in large part as a result of the collaborative approach the project office took with the three bidders – and beyond with respect to all internal stakeholders.
- Formal hierarchical governance appeared to be focused on decision approvals rather than status reporting. Aside from the project's major government approvals (a similar two-gate government approval process to that in Canada), this included somewhat independent-to-RfT study work that shaped and selected key combat system supplier solutions for government approval. However, there was considerable governance connected to many aspects of the NSP which were external to the project but with strong interdependencies. As well, the project employed many committees initiated by the project director to progress their work. Of note, regular project reporting did not seem to be a major burden.

Canadian Surface Combatant Process in Comparison

On the face of it, there are some major similarities. The CSC project was announced a year earlier than the Australian project (2008 versus 2009) and completed the selection of a preferred bidder a few months after Australia in 2018. Both processes selected the BAE Type 26 as their reference point design, to modify to meet national requirements. External advisors contributed to both processes. Canada engaged an external legal company, First Marine International, and a consulting company to provide supplemental procurement RfP advice. Australia hired experienced defence contractors to be part of and advise the project office, including the four-member expert advisory panel. Both were interested in a continuing flow of shipbuilding work to selected shipyards – in Canada, the National Shipbuilding Strategy was well into implementation before the RfP was in development, whereas the Australian NSP was just ramping up.

However, the differences are many and seem significant.

The Australian decision upfront to restrict the competition to three shipbuilders and their warship designs is a procurement aspect that Canada did not contemplate – the CSC merely requiring shipbuilders to qualify to compete, which over 10 of them did. Thus, Australia was able to set conditions that shaped the subsequent procurement approach and documents to be potentially quite different from those used in Canada. As well, three bidders facilitated industry engagement and rendered the funding of the bidders affordable throughout the process as an important risk-reduction activity. Canadian PSPC officials should investigate this Australian aspect of early down select for future consideration.

The CSC RfP was only announced after considerable industry engagement and two changes to procurement methodology after project definition approval (Canada's first "gate"). As previously mentioned, the RfP was open to a large number of qualified bidders who might choose to respond (or not), was unfunded (no potential bidders received any funding), was open 13 months for bidders to respond and resulted in preferred bidder announcement (from the three bids received) two years after RfP release. In Australia, the initial procurement strategy at gate 1 endured, the three industry participants who qualified in 2015 did not directly review the RfT but were provided a degree of funding support for three years (in the tens of millions of Australian dollars), and the RfT was open for less than five months with the preferred bidder selection 15 months after RfT release.



In Canada, the project management office was about the same size as in Australia but entirely drawn from the public service and the Canadian Armed Forces, with a significant number of team members having little or no applicable experience or knowledge. In Australia, knowledgeable contractors significantly populated the project office in support of the DoD cadre.

In Canada, there was considerable commoditized support – periodic engagement with the project by government stakeholders who were neither dedicated to the CSC project nor responsible to the project manager but who exercised considerable influence on project work. As one example, this included legal counsel that was not dedicated to CSC. As another example, this included extensive focus on the Canadian industry component in the form of a comprehensive value proposition rule set which was addressed by non-dedicated representatives of ISEDC. And in neither of these cases did the legal or ITB representatives report to the project manager. In Australia, the project director was entirely responsible for the work of procurement lawyers, contract managers and commercial specialists (e.g., financial matters, proposal costing) and for establishing the RfT terms around Australian industry content (which in comparison to Canada employed what might be described as a rule set-lite approach).

In Canada, significant effort was expended on regular reporting to layers of senior governance throughout the RfP development phase, predominantly on project status and changes. Despite the onerous reporting demands, only a few key decisions were rendered and rarely in a timely manner. The opposite was the case in Australia.

In Canada, when external support was required under contract to the project from other than Irving Shipbuilding (and even then competitions were often required of the NSS shipbuilder), a competitive process was required in all cases. In Australia, the director-general to whom the project director reported had much greater leeway to sole-source required external expertise, as in the case of the expert advisory panel.

In Canada, there is a largely standardized structure for RfPs and a significant bank of standard terms and conditions for use in contracts; changes are discouraged, so considerable effort was required to tailor them to meet CSC's requirements. In Australia, tailoring to render fit for purpose was more the default condition; in the FFP's case, there was substantial tailoring of both the RfT and contractual terms and conditions in the head contract.

In Canada, the approach was to generate stand-alone contracts for sequential statements of work (e.g., design and ship construction in separate batches) which introduced challenges in carrying commitments made from one contract to follow-on agreements. And for CSC, the project management office generated all scopes of work. In Australia, the head contract amendment approach seemed better at ensuring the prime contractor's end-to-end accountability, and similar scopes of work were intended to be generated through collaboration between the prime contractor and the project office.

For CSC, the initial RfP included hundreds of mandatory technical requirements characterized in great detail. All of them required objective evidence to demonstrate compliance; all bidders experienced compliance challenges of such significance that the number was dramatically reduced and a bid cure process was introduced. For the Future Frigate, there were only a few mandatory requirements of any kind; responses to questions provided descriptive responses on what bidders would provide and how, with a related evidentiary bar that struck me as equally effective but much easier to meet.



Also in the mandatory category in CSC were such things as intellectual property, liabilities and insurance requirements – such terms being debated at great length before finalization (in the case of intellectual property with final decisions only in the last hours before RfP release). Australia employed the more pragmatic approach of defining desires without mandatory minimums.

In Canada, the evaluation standard was a weighted scoring system across hundreds of criteria which would then roll up to deliver a comparative numerical assessment among bidders – such scoring methodology requiring exposure as part of the RfP process to potential bidders and therefore finalization before RfP release. Furthermore, uncertainty in requirements was eliminated as a matter of course to ensure that all bidders would respond with proposals based on the same requirements and assumption set. The government was essentially bound to award the contract to the bidder achieving the highest score. In Australia, the evaluation created global assessments against the major project objectives – such assessments being unique to each bid with no requirement to compare between bid responses. The bidders were not provided any detail regarding how their proposals would be assessed, so the project office had more time to finalize the evaluation methodology details before RfT closure. And as already mentioned, bidders were allowed to set and detail their own assumptions where there was uncertainty. Nor was the bid evaluation report the only factor the Australian government used in deciding on the winner.

In Canada, collaboration was often strained between the project management office, industry and internal stakeholders. In Australia, collaboration was a priority for the project office with all involved in the project.

In CSC, the approach to costing was largely developed from a blank sheet of paper as the RfP evolved. In Australia, a specialist addressed this matter in a much more comprehensive manner based on years of experience and mastery of the financial aspects.

In Canada, fairness monitors are hired under contract to oversee project activities, largely in a real-time audit manner, with a report regarding process fairness made public at the end of the evaluation. In Australia, the probity advisor conducted similar oversight duties but was clearly motivated to work with the project office to find solutions that would better ensure project success; as I understand it, the probity advisor report is only promulgated within the government (though accessible under Freedom of Information with redaction).

And while litigation was always a possibility for both projects, there was more of a preoccupation in Canada around the pursuit of zero risk by achieving fairness and certainty as absolutes. Australia's RfT appeared to be based on the recognition that, in selected existing military off-the-shelf ship designs, which rendered the competition to be more about assessing apples, oranges and bananas, a more pragmatic RfT approach was needed. But there may also be institutional differences regarding what can or cannot be subject to legal challenge that would be worth further investigation.

So What?

One might wonder why I, as a director-general in the Department of Defence, would not have pushed for – if not insisted on – changes as the CSC procurement process evolved. Aside from the fact that one's influence is limited (e.g., in convincing the naval client to dramatically reduce or prioritize the number of mandatory operational capability requirements), two other factors played a part in the resultant procurement process and RfP.



The first is that a separate department of the Canadian government has responsibility for the procurement process, the RfP and the resulting contracts. While I was fortunate to work with a colleague of considerable experience, insight, knowledge, understanding and flexibility, the team that he worked with left one with the feeling that they did not want changes to their tried and true way of doing business. I would hasten to add that adherence to prescriptive and traditional methodologies was apparent within DND as well – my experience being that this culture is somewhat pervasive throughout the Canadian government, as it admittedly is with most large organizations. Speaking truth to power mattered and was occasionally critical to the outcome. It would seem apparent that our systems are not set up to deal with extremely complex projects, it having been suggested that our procurement system is more attuned to buying off production lines.

The second point is that I was simply unaware of the intricacies of the Australian approach – or those of any other nation – when I was involved with CSC.

The Australian experience taught me what in hindsight is obvious, that there is more than one way to go about the competitive selection of prime contractors to deliver complex weapon systems platforms. While each is tailored as it should be to the nation and culture executing such projects, those responsible for complex procurements could benefit by being knowledgeable about the details of what is going on elsewhere and open to trying different approaches.

It is also clear that when pursuing such complex endeavours, there are no silver bullets or templates. Australia's approach was not without its issues, and some of Canada's procurement elements were exemplary. And even if Canada had an in-depth understanding of the Australian approach before launching CSC, there is nothing concrete to indicate that the CSC procurement process and documents would have been any different. Finally, the frigate projects in Canada and Australia successfully selected a shipbuilder and ship design, although litigation is apparently part of the fallout of Canada's decision.

However, it strikes me that Canada's procurement approach to the development and execution of the RfP for CSC seemed much more complex and thus work-intensive for all concerned when compared to the RfT for Australia's Future Frigate Program. This reflects an expensive way of doing business for Canada and for bidders that consumes immeasurable person-years of effort.

This raises a concern related more broadly to culture. Our government traditionally has worn blinders when it comes to executing complex projects involving procurement. No one will change their ways in dealing with tough and important stuff based on reading a few articles – or after getting a briefing at some international gathering. It takes a serious investment of effort to study what others are doing with people integrated into their procurement activities. It requires an abiding determination by those in charge to understand emerging practices and thought leadership and to embrace and resource continuous improvement. And it is even more important and challenging when there is such an explosion occurring globally in research-based approaches to business.

Individual departments are pursuing innovation initiatives but there is less of value occurring where processes involve multiple departments – as in the case of complex project procurements. In this area, Canada's future could benefit tremendously.

Within the marine sector, there is now hope. An interdepartmental marine committee of directors-general across all government departments now exists, with the stated purpose “to improve its processes, consistency and approaches” relating to ship repair. Multiple



subcommittees are in place or forming, one of which is working with Canada's major marine industries. Among the issues they are wrestling with is innovation, I assume after prodding by our shipbuilding and repair companies. If properly resourced, clever and supported to the deputy minister level, much could be accomplished of value to NSS and indirectly for Canadians.

Based on this assessment of the Canadian and Australian processes to select new frigates in this decade, one useful place to start is by comprehensively exploring other nations' approaches to identify gems we might adopt and trial before we need to buy warships again.

► About the Author

*After a 38 year career with the Royal Canadian Navy, **Ian Mack** (Rear-Admiral Retired) served for a decade (2007-2017) as the Director-General in the Department of National Defence responsible for the conception, shaping and support of the launch and subsequent implementation of the National Shipbuilding Strategy, and for guiding the DND project managers for the Arctic Offshore Patrol Ships, the Joint Support Ships and the Canadian Surface Combatants. He also had responsibility for four vehicle projects for the Canadian Army until 2015. Since leaving the government, he has offered his shipbuilding and project management perspectives internationally. Ian is a longstanding Fellow of the International Centre for Complex Project Management. He also is allied with Strategic Relationships Solutions Inc. He is married to Alex, and has three grown children. With few accommodations for impaired mobility, he remains active. Upon retirement, he founded a small business, Xi Complexity Consulting Inc. in Ottawa Canada.*

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