Emerging Lessons from the National Shipbuilding Procurement Strategy

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The termination of unaffordable procurement processes in 2008 for the construction of National Defence and Coast Guard ships in Canada led to development of the National Shipbuilding Procurement Strategy (NSPS, later shortened to NSS). This endeavour was announced in the spring of 2010, and two Canadian shipyards were competitively selected by the fall of 2011. By February 2012, Irving Shipbuilding and Vancouver Shipyard were under binding agreements to build new classes of ships for the Canadian Coast Guard and the Royal Canadian Navy, potentially spanning 25 to 30 years of work.

Soon after the announcement of the winning shipyards, kudos and awards were the order of the day for the procurement process used and completed in record time without formal challenge. The five shipyards qualified to bid shaped the process and documents with their significant input. The government procurement team also employed a number of independent third parties to review the Request for Proposal, one of which provided key input to the bid evaluation. By this reckoning, NSPS was launched well.

However, some participants and observers have less positive perspectives regarding the launch and some of the foundational elements. Recently, there has been growing interest in identifying lessons from the NSPS journey. As an official in National Defence who was very much involved from its inception in the summer of 2008 through to the end of 2016, it is appropriate for me to offer my thoughts on why we did what we did.

Fortunately, we do not have to rely only on my memory. To the credit of then-Commodore Patrick Finn (the hands-on leader for NSPS from 2008-2010), the NSPS office in the Department of National Defence applied a deterministic approach to the strategy. The small team documented many major decisions that shaped the strategy and the subsequent procurement in short papers that in time will be available from government archives. These papers will contribute significantly to the development of lessons for the future.

In the meantime, I offer my perspectives on the reasons behind potentially controversial decisions. They may seem defensive, but perhaps for good reason.

Why was NSPS Launched with Such Urgency?

A number of terminated government ship procurement activities in 2008 were a wake-up call for those charged with renewing government fleets. It was clear that shipbuilding capabilities in Canada had atrophied – there had been a 15- to 20-year gap in government shipbuilding programs for vessels over 1,000 tonnes. The policy for building government vessels was “build in Canada”, which argued for a renewed shipbuilding capability. Further exacerbating the matter, the traditional approach of competitive procurement for each project could require the government to pay for the cost of rebuilding many shipyards across the country within the budgets of the ship acquisition projects themselves. And subsequent to each delivery, such capabilities could atrophy.
after delivery of vessels unless there was follow-on work, as had happened with the Irving’s shipyard in Saint John after delivery of the Canadian patrol frigates. This is commonly known as the boom and bust cycle.

With Navy and Coast Guard fleets needing renewal, a new approach was urgently needed to enable progress on six shipbuilding projects that were underway (some of which were late), with more to come. This lent urgency to the launch of NSPS. As well, there was a shortage of people who could be freed up and dedicated to developing a new initiative. A small NSPS office was cobbled together, consisting of a few reassigned and part-time naval officers plus one experienced procurement officer from the Public Works and Government Services Department. Not surprisingly, in a program of such size and complexity, the team faced skeptical bureaucrats across government who had to be convinced, and many in the private sector who worried about the impact on their business prospects.

A fundamental principle of executing complex projects was thus in jeopardy from the beginning – taking the time at the front end to get the project right and all stakeholders on board before getting underway. The objective of being fleet of foot was achieved and feted, but there were casualties. For example, the priorities of competing demands between Coast Guard and Navy shipbuilding projects were unaddressed, adding confusion to the list of challenges the Vancouver Shipyard’s leadership faced in the early days.

Hindsight suggests that the quest for speed caused mistakes. As the director-general responsible in National Defence for NSPS at the launch and during the first four years of implementation, I bear some of the responsibility for the resultant shortcomings.

**Could Schedule Delays to Projects Underway Have Been Avoided?**

With three Coast Guard and three Navy projects already launched in 2008/2009, the emergence of NSPS created a degree of confusion for these shipbuilding initiatives. By June 2009, all six were included in the scope for NSPS to maximize the strategy’s value and long-term attributes. As a result, the prudent government procurement practices of fairness and of acting in good faith precluded further discussion with prospective industry on these projects.

Existing concept design contracts and studies could continue, but the inability to speak to potential private-sector implementers meant that meaningful additional progress was limited and potentially counterproductive. This “cone of silence” remained in place during the competitive shipyard selection process, ending with the announcement in the fall of 2011. Therefore, despite the speed of NSPS’ procurement process, my sense is that some projects effectively lost some three to four years of progress. Could more have been done concurrently? Perhaps, but the principles of competitive procurements and the developing partnering relationships for each bidding shipyard prevented many actions from being taken with the private sector.

**Was the Governance of the Shipyard Selection Competition Effective?**
This aspect of complex endeavours is a critical component to success and never easy.

Given the magnitude of the opportunity and the novelty of this national endeavour, a robust and tailored form of governance was put in place to oversee the procurement process to select the two NSPS shipyards. This consisted of three hierarchical tiers across departments and agencies involved – deputy ministers, assistant deputy ministers and directors-general. Whereas such an approach could have been inefficient, I think it actually sped up decision-making and enabled policy refinements in record time, with so much horsepower focusing very regularly on this initiative.

In hindsight, one problem was a power imbalance between National Defence and Public Works and Government Services Canada (PWGSC). Given the sense of urgency, PWGSC was very much in charge of the Request for Proposals. This relationship was not aided by a personality mismatch involving myself which strained communications, detrimentally impacted a number of critical NSPS aspects and created stress for subordinate staff intermediaries. This led to some surprises and shortcomings in the procurement activity. In National Defence, I was accountable and at least partially culpable in this relational breakdown. But it points to a significant challenge in complex government procurement activities involving multiple departments, where understandably strong differences of opinion emerge. The importance of both a balance of power among stakeholders and an effective and informed final arbiter protocol is one of the tenets of complex projects – and a useful lesson to take away.

Should It Have Been Mandatory for Shipyards to Lead the Bids?

The procurement process required that a Canadian shipyard be the formal bid leader. Some people said both at the time of the selection competition and since that there may have been better Canadian companies to lead such bid proposals and to be the prime contractor accountable for the delivery of shipyard services. The premise is that shipyard capabilities had atrophied to the point that they may not have been well positioned to be the prime contractor if they won. As well, there was ample evidence that many different approaches to the duties of prime shipbuilding contractor had worked internationally, from ship designers to combat system integrators and shipyards themselves.

As I recall, there were a number of reasons for the position taken. The shipyards that qualified to compete under NSPS were in most cases going concerns. (In the case of Irving Shipbuilding, the Halifax shipyard was under contract to build the Hero class for the Coast Guard). In terms of value for money, most assessments indicated that the biggest bills and frequently, the most challenging risks, came from the construction work for non-combatant ships. This was especially true where the number of vessels of a final design was such that construction would continue well past the majority of the design work (e.g., the intent for the Canadian Surface Combatant [CSC] project is to order 15 warships). Based on such factors, there was no desire to pay a substantial mark-up on shipyard work to a prime contractor that was not constructing the ships. Nor was there any appetite in government to be restricted in contractual dialogue with the shipyards over decades,
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as is typically the practice if the prime contractor is not the shipyard. As well, aside from the CSC project warships, the ships to be built were not dissimilar to non-combatant marine vessels delivered worldwide by shipyards that routinely were prime contractors. Finally, each bidding shipyard was required to build a team of partners to support them, so good advice was expected to be on board for the bids and subsequent execution of NSPS. Therefore, the conclusion was that the shipyards would typically be the prime contractors – for all but the CSC Project, which would be decided later) – and this made them the preferred choice as the bid leads on the NSPS competition.

I accept that better Canadian (or even international) companies could have been NSPS prime contractors, so that the launch might have been smoother. Furthermore, downstream transitions in prime contractor could have occurred as shipyards gained capability. But a key issue was the assessment that the terminated procurement processes in 2008 related in large part to shipyard capabilities. So the clear desire was to establish long-term relationships with shipyards to avoid repeating the past.

In place of commercial complexity, I believe we effectively opted for simplicity. However, it does suggest that, as is typically the case, the government should avoid dictating the commercial arrangements and allow the marketplace to organize as it chooses – especially when embarking on complex procurements.

Where was the Clarity Regarding NSPS Deliverables?

Many wonder why there was little clarity in the details of how and when NSPS would unfold. They argue that no master plan was created and agreed upon upfront, but that NSPS simply evolved once the shipyards were selected. For example, the order of precedence to build the Coast Guard’s Polar Icebreaker and the Navy’s Joint Support Ships is often highlighted as something that should have been addressed before NSPS was launched. Both clients wanted their ships soonest, but decisions were not taken for some time after NSPS implementation. Concurrently, they observe that things were inefficient and ineffective – ships were not soon delivered, while the initial project budget and schedule performance were less than laudatory.

This scenario is not uncommon when embarking on complex initiatives. The reality is that, while one always needs a plan, it will change dramatically and often when navigating complexity. For over a decade, “wave planning” has been embraced for complex projects. So in terms of clarity, the delivery of a detailed plan for a complex endeavour is a lose-lose proposition – if you offer little clarity, you will be cursed because the project may not be approved, whereas a set of early predictions based on comprehensive planning is likely to be wrong as well.

The Canadian government sought as much clarity as possible when approving NSPS. While this is undeniably the right approach, there is no direct linkage to a reduction of risk when dealing with complex projects like NSPS. Thus, when pressed for considerable detail during the launch, my preference was to offer as few details as possible until we had selected the shipyards and
developed at least a modicum of a collaborative relationship with each. Once the people responsible to deliver were in place, then meaningful commitments could be made. And besides, new shipyards had to be built before construction of the first ships could occur, which would allow adequate time to assess the possibilities.

In the end, government spokespersons made commitments. I and others failed the campaign to manage the public’s expectations. This is another key lesson to be relearned – the strategic importance of managing expectations when pursuing complex national endeavours.

Why Did New Shipyard Facilities Take so Long to be Delivered?

Some people felt more could have been done before the selection of shipyards but certainly in the period between selection and the signing of the initial agreements. Earlier facility design decisions might have defined the workforce parameters so recruiting efforts could start earlier. In support of this concept, the more recent Australian Strategic Shipbuilding Plan introduced shipyard facility modifications which they funded at a pre-selected shipyard (a key difference to NSPS) before the shipyard operating entity was selected.

In fact, decisions by the NSPS shipyards to refine facility development plans from the “as bid” proposals were made to better reduce the risk of not meeting a contractual commitment to an established and agreed-upon set of best practices. All of this could enable beneficial outcomes in Canada. Both winning bidders proposed to absorb the capital cost of upgrading their facilities. In Irving Shipbuilding’s case, new facility construction was affected by the need to first deliver the Coast Guard’s Hero class of vessels before fulsome recapitalization could occur. And as a final point, the design work required for the first vessels to be built in each NSPS shipyard was a concurrent process; by the time the designs had been adequately completed, there was little material impact on the commencement of ship construction by the actual facility construction activities.

In effect, this relates to the same expectation management lesson mentioned previously.

Why was the Shipbuilding HR Challenge not Addressed as NSPS was Launched?

It was always recognized that there would be a significant HR challenge if NSPS was approved, which might justify an NSPS-wide national strategy to be established.

The NSPS office did the work in 2009 to approximate the size of the blue collar workforce gap in Canada. They demonstrated a significant downturn since 2000 of available skilled blue collar tradesmen who might be attracted to bring their relevant skills to bear in shipyards, with additional and tailored training. Of course, there were other competing demands for such capabilities, notably in the gas and oil sectors.
However, shipyards were closing around the Western world in 2009, so there was optimism that skilled ship construction tradesmen could be attracted from offshore. As for production foremen, shipyard cost estimators, shipyard contracting and scheduling professionals and senior shipyard leaders, it was assumed that the lure of new shipyards and the small numbers required from offshore would be manageable if the financial inducements were paid.

In terms of government employees with the necessary shipbuilding acumen, the intent in some quarters was to borrow skilled officials to gain the critical knowledge needed from our allies.

As well, there was barely enough government HR capacity to deliver NSPS, let alone launch another national strategy.

While the blue collar challenge turned out to be difficult, I believe the white collar components of the enterprise in shipyards and in government turned out to be more problematic. I suspect the HR challenge will remain. Thus, if NSS is to prevail as a sustained Canadian enterprise, perhaps a national shipbuilding HR strategy is still needed – certainly, this qualifies as a lesson to be learned for any national endeavour. Australia included an HR strategy within their Strategic Shipbuilding Plan – one can hope that they learned the lesson from our experience.

**Why did Canada Pay for Some Redesign Work?**

In normal circumstances, prime contractors have free rein to design to meet the contractual requirements. To do otherwise is to limit their accountability to meet contractual vessel performance requirements.

NSPS was launched with at least four of the six shipbuilding projects fairly well advanced in terms of design. Both shipyards proposed significant and somewhat costly reviews of the work completed by other ship designers for the government as part of their due diligence. And if concerns were raised and significant redesign was recommended, the government would be caught in the middle between two design houses.

There was reluctance in some quarters to approve such work with the related budget and schedule impacts. This created some tensions before approving the shipyard design review work and then in handling some significant and unexpected issues identified during design reviews. With pronounced impacts on some project budgets and schedules, there was a need for new project approvals – not a simple task.

The lesson is not new – when an implementation party changes early in a complex process, the new party must be allowed to review the action taken to date and make changes they believe are needed if they are to be held accountable for the client’s outcome. If not, accountability becomes shared at best but is most likely the client’s to bear. And as schedule is always king in shipbuilding, time should not be wasted in debate.
Transitions are always disruptive. Clearly, this was the case with NSPS and it affected the projects already underway. But it relates very much to the subject of project budgets and schedules.

Why Were There So Many Cost and Schedule Overruns?

There can be no question that the government shipbuilding projects initially intended as in-scope for NSPS have seen budgets grow (sometimes more than once) and schedules slip (often dramatically). And rightfully, everyone is asking why.

This subject goes well beyond the scope of this paper. Much has already been written on the traditional challenges inherent in Canada’s military procurement system and processes relating in the end in changes to cost and schedule, by me and by others in a more scholarly manner. This system introduces such issues in every complex procurement activity, as it did with the shipbuilding projects under NSPS. But NSPS added a further degree of challenge.

The conception, development and procurement of shipyards under NSPS was not foreseeable for the six projects already underway and introduced schedule slippage in many projects (and thus in their costs). Some projects intended to compete their construction work, but NSPS introduced a negotiated contract cost. In the shipyards, new norms had to be created for the time and cost required to produce ship parts with the new equipment and the new workforce – and then only once the equipment was proven and the workforce experienced enough to deliver repeatable results. Experienced estimators had to be hired away from other shipyards – a special skill in shipbuilding because of its complexity and with a very small pool available globally. Then, as schedule slippage occurred in the first ships to be built, there was a knock-on effect on subsequent shipbuilding projects.

Although such factors were well understood from the beginning to affect budget estimates repeatedly (and especially in the case of Vancouver Shipyard because of its order book), one would have to wait for new estimates to be generated by shipyards with some degree of confidence before asking the government to approve new budgets and schedules. Some have suggested regular enterprise-wide cost recalculations, but they need to be done when credible information is available, which renders such an approach ineffective. And none of this engenders trust in a risk-averse government environment, which leads to more scrutiny by officials new to dealing with such complexity and little enthusiasm among decision-makers when asked to provide approvals.

Despite these factors and notwithstanding that such overruns are quite normal in most countries, these perturbations in schedule and costs have clearly eroded support with some powerful government stakeholders from very early days. To the best of my knowledge, there is still no comprehensive orientation process for those joining the NSPS enterprise to ensure they have the requisite insights to understand these important factors. As well, government authorities have done little about learning from allies and international associations on adopting new approaches to navigating complex projects. These are areas where my influence in places such as Treasury Board was insufficient to bring strategic change.
Again, we see the importance of managing expectations.

**Are the Shipyards Meeting Productivity Benchmarks?**

The measurement of productivity in ship construction is controversial at best and exceptionally complicated for new shipyards. Part of the controversy relates to the comparability challenges of the ships under construction in terms of their complexity and density – this is akin to manufacturing and assembling sports cars versus buses. Productivity is in effect the integration of a myriad of different processes, and their integration takes time to become effective and then efficient. The outcome is affected by every member of the enterprise, including the client. In fact, the immaturity and level of scrutiny by the client – these being uncommonly low and high respectively among most government clients – and the state of collaboration can dramatically lower production efficiency. Productivity measurement is even more difficult if there are few ships being built of a particular design, as one typically requires an order for four vessels or more to work towards a meaningful level of productivity – the third is usually in construction before the first is delivered and all of the improvements can be incorporated.

Under programs like NSPS, too much productivity can also be concerning. While one may save dollars, one could end up re-creating the troublesome boom and bust cycle.

Everyone wants productivity on both sides of awarded contracts, so it is always a point of discussion and taxpayer/media concern for government contracts. And it was an irritant to many for years that no assessment of productivity had been rendered, when in reality it was still too early to do so. In Halifax, such assessments should be meaningful for the fourth Arctic Offshore Patrol Vessel. In Vancouver, such meaningful evaluations will be less useful beyond delivery of the Polar Icebreaker, due to such small order numbers for the first four classes of ships to be built. Nor does a single productivity number tell you much.

For some time now, many officials have recommended focusing instead on a set of selected indicators to measure attributed costs and benefits in key categories. If we can see continual lowering of costs for the same work with increasing benefits to the client, then we should rejoice.

The lesson here relates to the knowledge and patience required to generate meaningful performance indicators, and to once again set expectations accordingly. In addition, more time spent upfront before the launch to gain clarity among all stakeholders would have helped – it is complex.

**Surely, There Will Not Be Gaps in Shipyard Work?**
Gaps of more than a decade created the boom and bust cycle that led to the loss of shipbuilding capability. Surely, then, an important objective under the NSPS is to continuously employ the workforce and facilities to avoid re-creating the conditions for the atrophy of shipbuilding capability. Many experts have made the point that gaps should be avoided to maintain a productive industrial capability. And with layoffs having already been reported, is NSPS not falling short of the mark? The answer is yes and no.

In a perfect world, shipbuilding would be similar to robotic production lines building cars with no gaps between models. That would be nirvana for those tradesmen who build ships. But ships are not cars, nor are the processes equally automated. Furthermore, projects are not always approved at all stages on time, particularly by the Canadian government. Nor can designs be modified and developed according to a predetermined schedule to enable ship construction – detailed designs are often late to need. Added to these factors, layoffs between classes are common because different ship designs will often require different sizes of workforce for efficient construction. And while there is always the desire and hope that shipyards can find work to fill the gaps, it is not easily achieved.

Therefore, blue collar workers are quite aware there will be gaps and layoffs in their careers, and this includes shipbuilding. I am not aware during the lead-up to NSPS approval of any commitment to shipyards to avoid layoffs. In fact, it was quite the opposite after studying the U.K.'s terms-of-business arrangement with BAE in 2009, which guaranteed payment of a workforce whether building ships or not. The strategy that was announced and launched in 2008 never made such commitments, for the reasons mentioned above. However, spokespersons were soon virtually guaranteeing blue collar shipbuilding employment in the NSPS shipyards.

Clearly, the issue is the length of the gap. It cannot last a decade. If it’s for more than a few months of unemployment, skilled workers will have to find other jobs and may not return once the shipyard is up and running again. But there are ways to selectively preserve key capabilities and keep critically skilled people for years without losing the capability. Furthermore, as seen elsewhere, blue collar workers will return to the shipyard if the next run of work is significant. They are resourceful in terms of the non-shipbuilding jobs they take, and they naturally avoid uprooting their families.

Nevertheless, this is one other area where NSS has evolved and created a significant issue. Again, this lack of clarity at the launch of NSPS has eroded confidence in the viability of NSPS.

**Is the NSPS Implementation Governance Effective?**

In terms of the government, the governance that was so effective during the execution of the novel NSPS competitive procurement remained in place during implementation – and to the best of my understanding, it is still in place today. But rather than being focused on NSS alone, it soon addressed all National Defence major weapon system acquisition projects such that NSS had to vie for attention at the senior tables. I and others think that the governance lost value once the
shipyards were selected and got underway. In hindsight, the precepts of governing complex endeavours should have been embraced in 2012, with tailoring to the new requirements in such matters as inviting external non-government domain/sector experts with relevant experience as advisers as a minimum, and as actual members of the governance system at the other end of the spectrum. (Today, allies are considering or experimenting with external co-chair members, going well beyond advisers).

In terms of governance of the shipyards themselves, the four core departments (Coast Guard, National Defence, and Public Services and Procurement as successor to PWGSC, and Innovation, Science and Economic Development) established separate three-level governance arrangements with each shipyard. These have suffered from personality clashes and a degree of asymmetric engagement (some members participating significantly at all three levels). However, these arrangements have generally enabled effective dialogue and joint decision-making in dealing with both the implementation of NSPS and the execution of the early shipbuilding projects. As well, they provided the foundations for the development of a collaborative set of relationships, which was a key objective at the launch of NSPS and is yet another essential criterion for addressing risk in complex projects.

Based on my NSPS experience, I believe the federal government could learn important lessons by exploring more flexible and tailored governance models for different complex initiatives, with help from external parties in the private sector who play in the realm of governance of complex projects.

**Concluding Thoughts**

NSPS was a bold idea, designed to address the problems experienced in 2008 and studied in the following two years. It was and remains a transformation in progress. Culture and process change are never easy but were very much required for NSPS. Significant unforeseen risks emerged. Speaking for myself as one of many plank-holders, I should have done better in navigating during the many years I was intimately involved.

From the beginning, I understood it would be a race between delivering successful outcomes and losing government commitment. I now think that, although NSPS was logically the right product to build ships – it is employed by governments whose shipbuilders we often envy – it may be unsuitable in terms of fit with the consciousness of influential Canadian government stakeholders. It will always be messy, and the apparent lack of priority for Canadians of the Coast Guard and the Royal Canadian Navy may render NSPS a casualty. But as counterpoints, I would highlight two thoughts. One, maturity takes time and may yet occur. And second, the saving grace may turn out to be what was initially seen as a liability – there is no Plan B.

Lessons need to be continually observed. They are worthy of capture, as diversity enriches the dialogue and the conclusions reached. However, they often require a long gestation period before the outcomes provide the nuances to deliver useful conclusions. Shipbuilding under NSS is just
such a long-term endeavour. While I applaud the dialogue and the perspectives relating to where Canada might have done better, I urge such observers (government and private sector alike) to pause and to exercise caution before being definitive.

I have often briefed on the many lessons that I learned over the course of NSPS from 2008 through the end of 2016. However, one thing stands out for me. My personal journey has taught me that the mindsets, principles and practices of navigating complex projects that have emerged in the last decade and are continuing to mature are essential ingredients of success in complex initiatives like NSPS/NSS. Were we launching NSPS today, we could realistically hope to have done better.

I have said before that Canada’s continuing prosperity can only grow through national endeavours which are exceptionally difficult by their very nature and which government must routinely nurture, if not manage. Mastery of complex endeavour leadership and execution is not a choice, it is imperative to our future as a nation.
**About the Author**

**Ian Mack** (Rear-Admiral Ret.) was the director-general in the Department of National Defence responsible for almost a decade (2007-2017) for the conception, shaping and support to 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. 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 and more recently an Executive Associate of Strategic Relationships Solutions.
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