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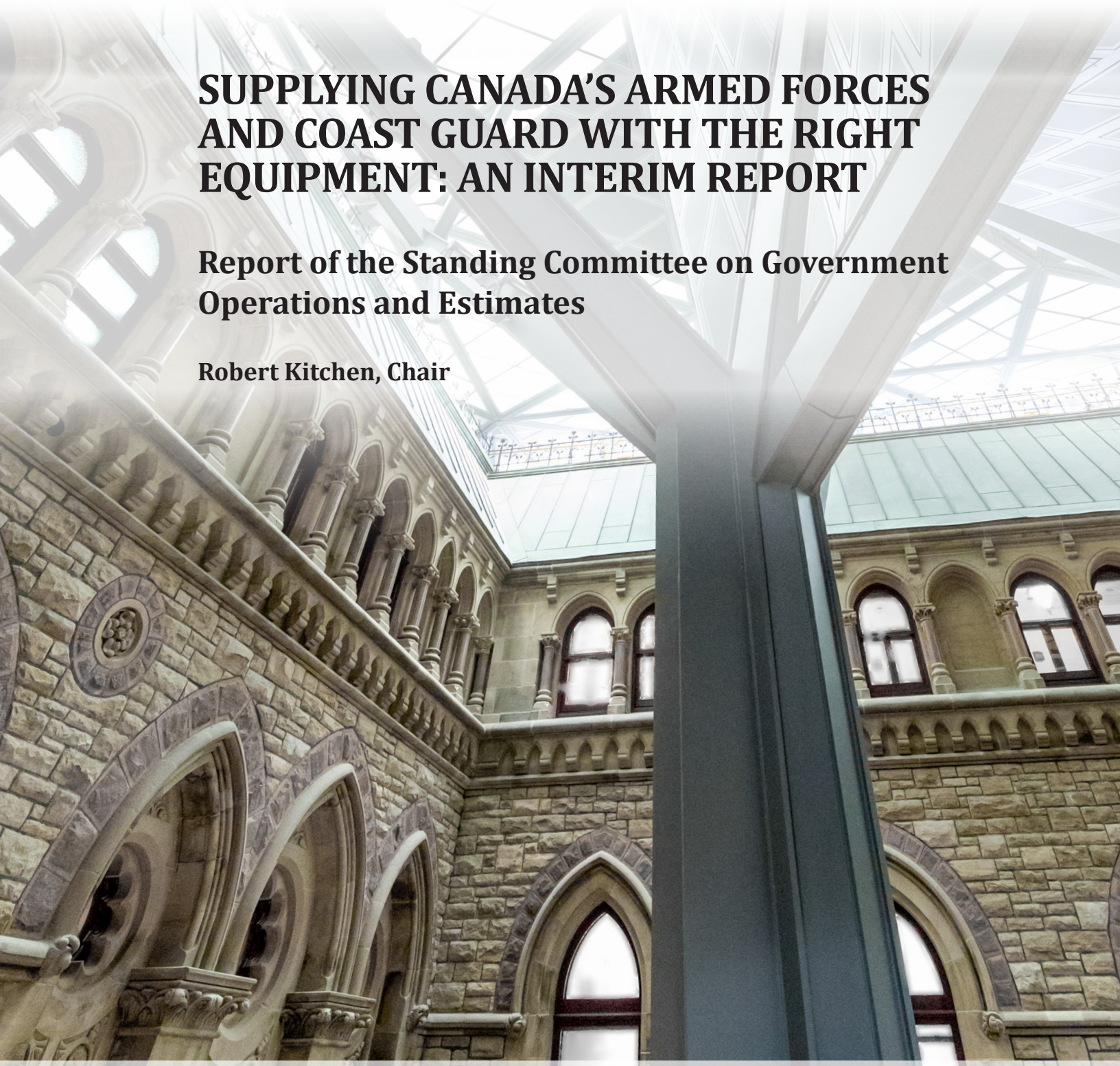
CANADA

SUPPLYING CANADA'S ARMED FORCES AND COAST GUARD WITH THE RIGHT EQUIPMENT: AN INTERIM REPORT

Report of the Standing Committee on Government Operations and Estimates

Robert Kitchen, Chair



JUNE 2022
44th PARLIAMENT, 1st SESSION

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NOTICE TO READER

Reports from committees presented to the House of Commons

Presenting a report to the House is the way a committee makes public its findings and recommendations on a particular topic. Substantive reports on a subject-matter study usually contain a synopsis of the testimony heard, the recommendations made by the committee, as well as the reasons for those recommendations.

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THE STANDING COMMITTEE ON GOVERNMENT OPERATIONS AND ESTIMATES

has the honour to present its

THIRD REPORT

Pursuant to its mandate under Standing Order 108(2), the committee has studied air defence procurement projects and the National Shipbuilding Strategy and has agreed to report the following:

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SUMMARY

Members of the House of Commons Standing Committee on Government Operations and Estimates (the committee) are undertaking a study on federal defence procurement to ensure the Canadian Armed Forces (CAF) and the Canadian Coast Guard (CCG) have the adequate infrastructure, equipment and technology to successfully fulfill their role. For the last several years, the committee has followed some of the most significant defence procurement projects through its studies on the main and supplementary estimates and during meetings with government officials. In addition, in 2020, it asked the Parliamentary Budget Officer to complete costing analyses of some of the large vessels being constructed under the National Shipbuilding Strategy (NSS).

On 15 February 2022, the committee commenced two studies on major defence procurement projects: one on air defence procurement projects and one on the NSS. Both are initiatives used to make long-term investments to enhance the CAF and CCG capabilities as outlined in Canada's defence policy, Strong, Secure, Engaged. The focus of the studies was two-fold: first, to obtain comprehensive status updates on the NSS and the bidding process for the replacement of the CF-18 aircraft fleet, and second, to study the main challenges impacting air defence procurement projects and the vessel construction and delivery under the NSS.

The committee is presenting an interim report summarizing the testimony of witnesses who described the procurement process and various defence procurement projects while identifying potential solutions to address the most significant challenges. Members will consider all testimony and briefs they receive as part of these studies to prepare their final report and formulate recommendations to the federal government. They plan to present a comprehensive report with recommendations to the federal government in Fall 2022.

This interim report provides background information on the defence procurement process, air defence procurement projects and the NSS. It also discusses the most important challenges identified by witnesses.

SUPPLYING CANADA'S ARMED FORCES AND COAST GUARD WITH THE RIGHT EQUIPMENT: AN INTERIM REPORT

INTRODUCTION

On 1 February 2022, the House of Commons Standing Committee on Government Operations and Estimates (the committee) adopted the following motions:

> That, pursuant to Standing Order 108(2), with respect to air defence procurement projects, the committee undertake a study of procurement objectives and the achievement of these objectives, including the bidding process for the replacement of the CF-18 fleet and other equipment required for national air defense, and receive an update on the current operational capabilities; that the committee consider the Second report of the Standing Committee on National Defence titled 'Canada and the Defence of North America: NORAD and Aerial Readiness' presented in 2016, the public testimony gathered prior to its publication, and Canada's defence policy 'Strong, Secure, Engaged'; and that the committee report its findings to the House.
>
> That, pursuant to Standing Order 108(2), the committee undertake a study of the current status of the National Shipbuilding Strategy; that the committee invite the Minister of Public Services and Procurement, the Minister of National Defence and government officials to address this issue; that the committee hold a minimum of five meetings on this issue; that the committee report its findings and recommendations to the House; that, pursuant to Standing Order 109, the committee request that the government table a comprehensive response to the report; and that the committee consider the Sixth report of the Standing Committee on National Defence titled 'The Readiness of Canada's Naval Forces' tabled in 2017, the public testimony gathered prior to its publication, and Canada's defence policy 'Strong, Secure, Engaged.'[1]

1 House of Commons, Standing Committee on Government Operations and Estimates [OGGO], *Minutes of Proceedings*, 1 February 2022.

The committee agreed to study both subjects concurrently.

From 15 February to 3 May 2022, the committee held eight meetings as part of these studies and heard from 20 witnesses, including the Office of the Auditor General, departmental representatives and shipyards, as well as experts and academics on matters related to defence procurement. The full list of witnesses is available in Appendices A and B. This interim report reflects what the committee heard during that period.

Following those meetings, the committee continued its study. The committee plans to complete its study in Fall 2022 and then present a final report with recommendations to the federal government on ways to improve the defence procurement process so that it provides the right equipment in a timely manner to the Canadian Armed Forces (CAF) and the Canadian Coast Guard (CCG) while ensuring value for money.

DEFENCE PROCUREMENT PROCESS

Background

During the course of the two studies, witnesses expressed their views on Canada's defence procurement process. They also pointed out several issues with this process and offered solutions to improve it. This chapter presents the main issues identified by witnesses.

According to an 11 March 2022 report by the Parliamentary Budget Officer, as of December 2021, the Department of National Defence (DND) planned to invest $164 billion on 348 capital projects by 2036–2037 under Canada's defence policy, Strong, Secure, Engaged.[2] That policy includes initiatives to make long-term investments to enhance CAF capabilities and capacity, such as air defence procurement projects and the National Shipbuilding Strategy (NSS). Troy Crosby, Assistant Deputy Minister, Materiel Group, DND, told the committee in March 2022 that DND is working on 74 major procurement projects and that the total procurement budget for 13 of these projects is $100 billion.

Some witnesses argued that Canada faces military equipment deficiencies because it has not prioritized defence procurement since the end of the Cold War (i.e., around 1990). They advocated for increased capital investments and to upgrade military equipment for

2 Office of the Parliamentary Budget Officer, *Planned Capital Spending Under* Strong, Secure, Engaged—*Canada's Defence Policy: 2022 Update*, 11 March 2022.

modern military needs. In their view, this is essential given the current international situation with Russia's invasion of Ukraine.[3]

The procurement process for defence-related goods and services varies depending on the contract. In virtually all cases, the contracting organization—DND or the CCG—must work with Public Services and Procurement Canada (PSPC) to purchase defence equipment.

First, the appropriate entity within the CAF defines its operational requirements.[4] The project team then proposes a deadline and analyzes options. Based on these requirements, DND or the CCG review procurement projects internally on grounds such as capabilities and cost. Internally approved projects then seek expenditure authority from the appropriate minister or Treasury Board, depending on cost.[5]

Next, PSPC solicits a supplier to provide the requested good or service. Purchasing organizations must solicit bids through a public, competitive process, with some exceptions.[6] PSPC evaluates the bids (if any) and issues a contract to the selected supplier. PSPC also monitors the contract until its completion. DND, the CCG and CAF may test complex equipment and request modifications before final delivery.

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3 OGGO, *Evidence*, 29 March 2022 (Christian Leuprecht, Professor, Royal Military College, Queen's University, 1705 and David Perry, President, Canadian Global Affairs Institute, 1645); *Evidence*, 1 April 2022 (Peter Kasurak, Fellow, Centre for International and Defence Policy, Queen's University, 1420 and Jeffrey Collins, Adjunct Professor, University of Prince Edward Island, 1300); and *Evidence*, 5 April 2022 (Robert Huebert, Associate Professor, Department of Political Science, University of Calgary, 1535).

4 The Royal Canadian Navy, the Canadian Army, the Royal Canadian Air Force and the Canadian Special Operations Forces Command can identify the need for the acquisition of new equipment by demonstrating that there is a "deficiency or emerging requirement" and that "new equipment or services are needed." See Department of National Defence [DND], *Defence purchases and upgrades process*.

5 DND, *Defence purchases and upgrades process*; Government of Canada, *Directive on the Management of Projects and Programmes*; and Public Services and Procurement Canada [PSPC], *Backgrounder: Piloting a streamlined approval process for defence procurements*.

6 The bidding requirement for goods may be waived if:

> a) the need is one of pressing emergency in which delay would be injurious to the public interest;
>
> b) the estimated expenditure does not exceed … $25,000 … ;
>
> c) the nature of the work to be contracted for is such that it would not be in the public interest to solicit bids; or
>
> d) only one person is capable of performing the contract.

Also, the requirement to solicit bids does not apply in respect of contracts to fulfill, on an interim basis, defence supplies or defence services or to ensure defence logistics capabilities. *Government Contracts Regulations*, SOR/87-402, ss. 3(1)(g) and 5–7.

Defence and CCG procurements greater than $100 million and not subject to trade agreements are subject to Innovation, Science and Economic Development Canada's (ISED) Industrial and Technological Benefits Policy, which requires companies contracted for major defence projects to invest an amount equal to the contract's value in specified sectors in Canada.[7]

According to Mr. Crosby, the federal government is

> renewing and replacing basic equipment fleets to support Canada's multi-purpose, combat-capable defence force. [It is] committed to providing the Canadian Armed Forces with the modern equipment they need, but [it is] also ensuring the best value for Canadian taxpayers, creating jobs, supporting Canadian technological innovation, and contributing to long-term economic growth across the country.

Mr. Crosby also commented that, due to their complexity, defence procurement projects vary greatly in terms of timelines. He testified that the federal government had demonstrated its ability to accelerate processes for operational requirements with COVID-19-related procurement. According to him, the federal government has made progress on sustaining in-service fleets and Strong, Secure, Engaged projects since the policy's release in 2017.

David Perry, President, Canadian Global Affairs Institute, said that the federal government has "made some good and noticeable progress lately on several [major defence procurement projects]," especially those related to air defence. However, Elinor Sloan, Professor, Department of Political Science, Carleton University, articulated that, despite problems with the defence procurement strategy, the federal government has not changed it since 2014. She added that there has not been any progress with that strategy and that it was time to review it.

Mr. Crosby highlighted that since 2020, the pandemic has impacted the federal government procurement processes as well as the Canadian defence industry due to remote work, reduced or interrupted production capacity, restricted travel and border closures, workforce turnover and supply chain issues. As a result, there have been inefficiencies, resource scarcity, delays and cost increases.

Collaboration Between Departments

Canada has a multi-departmental approach to defence procurement that primarily involves the following federal entities: PSPC, DND, CCG (through the Department of

7 The policy may be selectively applied to defence procurements valued between $20 and $100 million.

Fisheries and Oceans) and ISED.[8] The Treasury Board and its Secretariat are responsible for the government's overall procurement policies, approving funding for major projects after they have received Cabinet approval and providing financial oversight of those projects.[9]

Simon Page, Assistant Deputy Minister, Defence and Marine Procurement, PSPC, argued that the current governance approach "is very close to a centralized model." He stated that PSPC "work[s] very closely with DND and [its] other federal partners to ensure that [it] provide[s] the acquisitions support needed to deliver the right equipment and services to the Canadian Armed Forces in a timely manner." He further explained that the defence procurement strategy governance approach allows PSPC and the client departments to synchronize and align their objectives and actions while considering specific variables such as procurement strategy, social procurement and Indigenous participation from the outset of the procurement process. As a result, all involved departments can "move forward in a swifter fashion."

Mr. Page also said that

> PSPC chairs the interdepartmental governance committees established under the defence procurement strategy to bring together all the key federal players to transparently consider trade-offs related to capabilities, cost, the timely delivery of equipment and services, and economic benefits to Canada.

Mr. Crosby noted that federal departments involved in defence procurement work closely "to address the challenges we have and seek advice from industry where that's appropriate." He explained that the vast majority of DND procurements are low-dollar-value and low-complexity activities solely managed by DND. Other departments, including PSPC, help DND with more complex and high-value defence procurement.

Centralizing the Governance Structure

Several witnesses discussed the idea of centralizing the defence procurement governance structure and creating a single organization responsible for that type of procurement, similar to the approach adopted by other countries. The Minister of PSPC's 2019 mandate letter included a commitment to work with the Ministers of DND and of Fisheries, Oceans and the CCG to bring forward analyses and options for the

8 See: Martin Auger, *Defence Procurement Organizations Worldwide: A Comparison*, Publication no. 2019-52-E, Parliamentary Information, Education and Research Services, Library of Parliament, Ottawa, 28 April 2020.

9 Ibid.

creation of a new department responsible for defence procurement. However, that commitment was not renewed in the Minister of PSPC's 2021 mandate letter.

Alan Williams, President, Williams Group, explained that Canada is the only country among its close allies that uses a multi-departmental approach to defence procurement. The United States (U.S.), the United Kingdom (U.K.) and Australia only have one minister (or the equivalent) and one department responsible for defence procurement. He commented that Canada's defence procurement is inefficient, due to diffused ministerial accountability that makes it challenging to oversee the processes, establish a forward-looking plan, measure the results and implement changes. In his view,

> there is excessive overlap and duplication between the roles of the Minister of National Defence and the Minister of Public Services and Procurement in Canada. Unless and until one minister is placed in charge of defence procurement, it will never be as efficient or as effective as it could be.

A number of witnesses agreed that the lack of an appropriate governance structure for defence procurement creates obstacles.[10] They suggested that assigning accountability for defence procurement to a single minister would improve the process and its outcomes. However, not all witnesses agreed with this.

Jeffrey Collins, Adjunct Professor, University of Prince Edward Island, noted that the creation of an organization dedicated to defence procurement would allow the development of specific human resource expertise and institutional knowledge. He noted that the last time Canada rapidly increased its military acquisitions, it had a separate defence procurement department entitled the Department of Defence Production, which was dismantled in 1969. However, he warned that reorganizing defence procurement when managing several major defence procurement projects might be challenging and he explained that there is already a centralized office for the NSS.

In Mr. Williams' view, although a defence procurement agency accountable to a single minister would not solve all procurement problems, it would strengthen accountability, streamline the process and generate savings.

Christian Leuprecht, Professor, Royal Military College, Queen's University, suggested that the federal government emulate other countries' approaches to defence procurement.

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10 OGGO, *Evidence*, 1 April 2022 (Professor Collins, 1335); *Evidence*, 5 April 2022 (Elinor Sloan, Professor, Department of Political Science, Carleton University, 1645 and Richard Shimooka, Senior Fellow, Macdonald-Laurier Institute, 1705); and *Evidence*, 8 April 2022 (Mark Norman, Vice-Admiral (Retired), 1330).

He discussed the Swiss approach, which is to approve a budget for a defence-specific project and to let the department of defence and the government procedural mechanisms decide what to procure with the allocated budget. He also shared the idea of appointing a "minister of defence industry, like in Australia, to ensure better political attention and expertise."

However, Kim Nossal, Professor Emeritus, Queen's University, explained that Australia created a separate department for defence procurement, but dismantled it and added defence procurement under the authority of the defence minister. Instead of creating a separate defence procurement organization, he suggested making the Minister of National Defence solely responsible for defence procurement and national defence expenditures.

Indigenous Participation

The Minister of PSPC's 2021 mandate letter includes a commitment to "[l]ead the implementation of the requirement for federal departments and agencies to ensure a minimum of 5 per cent of the total value of federal contracts are held by Indigenous businesses."

Mr. Page explained that the federal government considers factors other than cost, such as social and green procurement and Indigenous participation, as it procures material and equipment. He said that through the defence procurement strategy governance process, PSPC works with other departments and agencies, including Indigenous Services Canada, to award contracts to Indigenous businesses. He provided the example of a procurement contract for the maintenance and in-service support of the North Warning System awarded to the Nasittuq Corporation, an Inuit company.

Mr. Crosby recognized that the federal government was not yet reaching its 5% target, but he remained optimistic that through continuous engagement with Indigenous communities, additional opportunities for these communities will be built into the procurement processes. He informed the committee that through a gender-basis analysis plus (GBA Plus) process, the federal government engages with various stakeholder groups, including Indigenous communities, to ensure it considers different perspectives and reflects the opportunities in its procurement processes. The federal government also develops skills-development and employment opportunities across Canada where defence equipment will be operated.

Other Challenges and Opportunities with the Defence Procurement Process

Witnesses identified several challenges facing the defence procurement process. These included: federal transparency and accountability; politicization of the process; the complexity of the process; staffing and expertise; off-the-shelf procurement; Industrial and Technological Benefits (ITBs); and operational needs and capabilities. Witnesses also identified opportunities to address some challenges.

Transparency and Accountability

Some witnesses shared their views on the transparency and accountability of the defence procurement process. Mr. Williams, Mr. Perry, Professor Collins and Peter Kasurak, Fellow, Centre for International and Defence Policy, Queen's University, all lamented that there is not enough information provided to the public or Parliament about major defence projects, making it difficult to assess costs and advance informed and timely challenges to decisions. However, Professor Leuprecht highlighted how increased transparency tends also to lead to increased risk-aversion, bureaucratization and slower procurement.

Richard Shimooka, Senior Fellow, Macdonald-Laurier Institute, attributed the lack of transparency to the multi-departmental defence procurement approach, which compels departments to operate in a collegial manner and not discuss problems openly with the public. Andy Smith, Deputy Commissioner, Shipbuilding and Materiel, CCG, explained that to leverage Canada's negotiating position, the government will only publish certain project costs once it has signed contracts.

Robert Huebert, Associate Professor, Department of Political Science, University of Calgary, and Professor Nossal both suggested that Parliamentary committees be empowered to receive secret information about defence procurement. Mr. Williams shared that, without performance measures available for public scrutiny, it is challenging to obtain results. To understand why costs rise and delays occur and to ultimately improve the procurement process, he proposed establishing performance measures for costs and timeliness.

Politicization of the Process

Some witnesses observed that defence procurement has been politicized by both the government and the opposition over the past several years. This has led to delays, cost

overruns and reduced defence capabilities, and has negatively affected Canada's reputation. The committee heard that this challenge is also present in other countries.[11]

Mr. Kasurak noted that the political neutrality and stability of senior public servants is a great asset in Canada because, as opposed to the U.S., these people and their institutional knowledge remain in place despite changes in government.

Complexity of the Process

The committee heard about the complexity of the defence procurement process and ways to improve it. Professor Collins said that according to DND, "it typically takes 15 years on average to deliver new equipment to the CAF, but this is an average; it can often take longer." Professor Sloan pointed out the risk-averse culture in the defence procurement process and noted that its bureaucratic paperwork system slows down progress on projects.

According to Professor Leuprecht:

> In any procurement, you have three objectives. You want to make sure that you get what you are buying on time, on budget and with the capabilities you need. It seems that in this country, we have great difficulties doing any of those three with the procurements that we ask for, let alone getting all three of those right. I think a proper process can get us much closer to hitting, hopefully, all three of those targets.

Professor Leuprecht suggested that the federal government either allocate more funds and staff to defence procurement or simplify the procedures that consume significant staff resources. He added that the defence procurement requirements should be streamlined and aligned to optimize the allocated funding. He said that although the CAF have faced a persistent lack of staff and funding, DND was unable to spend 5% of its overall budget allocation in 2020–2021. According to Professor Leuprecht, this indicates that there is a mismatch between funding and procedures. In response to a question from a committee member, Mr. Crosby explained that because the federal government pays suppliers once it receives the material, there was lapsed funding in 2020–2021 for defence procurement due to late deliveries.

Mr. Perry shared that there are many different reasons explaining why Canada's defence procurement appears inefficient compared to that of other countries but further noted

11 OGGO, *Evidence*, 29 March 2022 (Professor Leuprecht, 1635); *Evidence*, 1 April 2022 (Mr. Kasurak, 1310 and James Fergusson, Deputy Director, Centre for Defence and Security Studies, University of Manitoba, 1400); *Evidence*, 5 April 2022 (Professor Huebert, 1535 and Kim Nossal, Professor Emeritus, Queen's University, 1535); and *Evidence*, 8 April 2022 (Mr. Norman, 1325).

that many aspects of the Canadian procurement process are different from other countries, which makes comparisons challenging. However, according to Mr. Kasurak, all democratic countries struggle with the allocation of public funds between various competing priorities in a fiscally constrained environment. According to him, Australia has improved its defence procurement processes more effectively than Canada in the last few years, although Australia still faces unresolved issues.

According to Mr. Kasurak, a positive element of the rigidity of the defence procurement process is that it allows one to follow the evolution of the process. Likewise, Professor Nossal noted that defence procurement rules are generally sound and allow enough flexibility. Professor Collins pointed out that other countries also have to manage complex defence procurement.

Staffing and Expertise

Mr. Shimooka highlighted that unlike the U.S. and the U.K., Canada does not have programs or courses to develop defence procurement expertise among public servants. He added that employment opportunities with the CAF and the federal government are not well known and that the remuneration offered for certain specialized skills is not competitive with the private sector. Nicholas Swales, Principal, Office of the Auditor General, Mr. Perry, Mr. Williams and Professor Sloan identified a shortage of expertise in the federal government that limits procurement outcomes. Professor Sloan suggested rebuilding the defence project management capability "decimated in the mid-1990s" by appointing one person to take charge of that task.

Off-the-shelf Procurement

Professor Collins explained that the risk with purchasing off-the-shelf defence equipment is that companies and countries manufacture goods with their own specifications, which are different than Canadian needs. Therefore, designs, which are inherently complex, must be modified to adapt projects to the Canadian environment. According to him, the benefits of off-the-shelf procurement, such as more rapid deliveries or lower costs, may not be realized once the design is modified, especially if the equipment is built in Canada.

Industrial and Technological Benefits

Several witnesses commented on challenges related to the ITB Policy, through which the government secures domestic socio-economic benefits for major defence projects. Mr. Perry indicated that it is difficult to evaluate the costs of that policy. However, in his

view, costs should be evaluated against net benefits in terms of economic productivity. Mr. Williams commented that the way the ITB Policy is used to select a winning bidder "is completely flawed" and that the ITB requirements create the risk of "sacrificing optimum solutions for theoretical jobs in the future." Moreover, Professor Leuprecht raised that "there [is] no methodology to actually measure [ITBs] that is broadly accepted by defence economists. The benefits are whatever we say they are." He suggested modifying the approach so that the main benefits would be an investment in sustainability for the Canadian industry to maintain a high-tech defence technology capability rather than the number of jobs that might be created in one riding.

Operational Needs and Capabilities

According to Mr. Shimooka, Canada's approach to defence procurement is not optimal, as it tends to be platform-centric and to overlook other considerations, such as changes to the strategic or technological environment. In his view, this is problematic and not effective in the new technological and threat environment because the equipment "will have limited utility for newer challenges that may emerge" and "means that Canada is highly focused on single capabilities to deal with multi-faceted challenges." Professor Huebert shared that Canada focuses on specific models of equipment instead of evaluating its needs to respond to Chinese and Russian naval threats.

Mr. Shimooka told the committee that "[o]ne of the biggest challenges is … basically trying to get software-enabled capabilities, which is this next generation of capabilities that are really critical for situational awareness, and identifying and prosecuting targets."

CANADA'S AIR DEFENCE PROCUREMENT PROJECTS

Background

This chapter summarizes the various perspectives witnesses shared on Canada's major air defence procurement projects. The current section provides background information about the Future Fighter Capability Project (FFCP) as well as projects to procure ground-based air defence (GBAD) equipment and to improve NORAD (the North American Aerospace Defence Command) capabilities.

Replacement of Canada's CF-18 Hornet Fighter Aircraft

The Government of Canada has been involved in next-generation fighter jet initiatives since 1997, aiming to replace Canada's aging CF-18 Hornet fighter aircraft (CF-18) fleet. When Canada procured its fleet of CF-18 jets in the early 1980s, their service life was

estimated around 20 years. However, they are still in use, with their service life extended through modifications.

In 2008, the federal government announced its intention to purchase 65 fifth-generation aircraft at an estimated cost of $9 billion. DND recommended that PSPC buy the F-35 Lightning II (F-35)—to which Canada has access through its Joint Strike Fighter (JSF) partnership—without a competition because it was the only fifth-generation aircraft available. However, a 2012 Auditor General of Canada report found that DND had underestimated the F-35 life-cycle costs and that PSPC had approved DND's proposed sole-source process without the required documentation.[12] The federal government subsequently froze its purchase and assessed other industry options.[13]

The Future Fighter Capability Project

In December 2017, the government launched the FFCP, an open competition to purchase 88 advanced fighters to replace Canada's CF-18 jets. The federal government issued a request for proposals to selected industry suppliers in July 2019 and completed bid evaluations in December 2021. It selected two options for fighter jets:

- the Gripen E, supplied by the Swedish government's SAAB AB (publ)–Aeronautics with Diehl Defence GmbH & Co. KG, MBDA UK Ltd., and RAFAEL Advanced Defence Systems Ltd.; and

- the F-35 Lightning II, supplied by U.S. government–Lockheed Martin with Pratt and Whitney.[14]

On 28 March 2022, the federal government announced it would enter further negotiations with the top-ranked bidder, the U.S. government with the F-35. Paul Thompson, Deputy Minister, PSPC, indicated that negotiations could "take up to a year." However, if negotiations fall through with the U.S. government, the government may return to the Swedish government for SAAB's Gripen E. The selected bidder is expected to deliver the first aircraft as early as 2025, with project close-out by the early 2030s.[15] The government estimates the cost of acquiring the aircraft and

12 Office of the Auditor General, *Replacing Canada's Fighter Jets*, Report 2 in *2012 Spring Report of the Auditor General of Canada*.

13 PSPC, *Summary Report—The Evaluation of Options for the Replacement of the CF-18 Fighter Fleet*, 10 December 2014.

14 DND, *Future fighter capability project*.

15 Ibid.

equipment, as well as their setup, at $15 billion to $19 billion.[16] However, details are not available about the proposed costs of purchasing, operating and maintaining each model.

Interim Fighter Capability Project and Hornet Extension Project

Until the FFCP is completed, the Royal Canadian Air Force (RCAF) requires interim aircraft and equipment to supplement its CF-18 fleet. In 2016, Canada began the process of purchasing 18 flyable F/A-18 aircraft and seven non-flyable F/A- 18 aircraft (for spare parts and training) from Australia. That project is now in the implementation phase. The final aircraft was delivered in April 2021 and the aircraft are expected to be fully operational by December 2022. DND estimates the acquisition costs of the F/A-18 jets at $339.3 million.[17]

A separate project, the Hornet Extension Project, is extending the life of the existing CF-18 fleet for an estimated cost of $1.3 billion. The project is at the implementation phase, aiming to have the CF-18s fully operational by 2025.

North American Aerospace Defence Command (NORAD) Projects

While some CAF procurement projects (e.g., the FFCP) will increase Canada's ability to meet its NORAD obligations, Canada continues to coordinate NORAD modernization efforts with the U.S. to ensure investments are aligned.[18] The August 2021 Joint Statement on Norad Modernization prioritizes investments in situational awareness; modernized command and control systems and infrastructure; deterrent capabilities; and research, development and innovation.[19]

Ground-Based Air Defence Projects

As described in Canada's Defence Procurement Blueprint, Canada is redeveloping its GBAD system.[20] Canada's GBAD system—which allowed the Army to engage low-flying aircraft—was retired in 2012 but is now being rebuilt to respond to new airborne

16 Ibid.

17 Ibid.

18 DND, "7. Global defence engagement," *Strong, Secure, Engaged: Canada's Defence Policy*.

19 DND, *Joint Statement on Norad Modernization*, 14 August 2021.

20 DND, *Ground Based Air Defence*.

threats.[21] The new system, announced in Strong, Secure, Engaged, is expected to comprise

> effector platform(s) (either guns, missiles, Directed Energy Weapon Systems, EW or a combination thereof), munitions, a sensor suite, fire control software and an integrated networked C4ISR [Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance] system.[22]

The proposed GBAD projects will mainly be commercial, off-the-shelf technology, and will cost an estimated $250 million to $499 million.[23]

Challenges and Opportunities for Canada's Air Defence Procurement Projects

The committee heard testimony about the challenges and opportunities that major air defence procurement projects raise for the federal government and the CAF. Several themes emerged about Canada's air defence procurement process, including the CAF's timelines; staffing issues; infrastructure needs; and operational needs and capabilities.

Timelines

Some witnesses expressed concern over the speed of Canada's air defence procurement projects. Mr. Williams indicated that in 2000, procurements took an average of 16 years, but that by 2011, the government had found success in reducing timeframes.

Professor Collins stated that "the procurement process for key air defence projects remains frustratingly hindered by both the politicization of projects and a cumbersome status quo process split between central agencies and defence procurement bureaucracy." He added that political prioritization, the process structure, and setting shorter timelines had helped other countries such as Denmark, Finland and Switzerland to make fast decisions. Mr. Shimooka explained that the U.S. and the U.K. can develop a new system in the time it takes for Canada to buy equipment off the shelf.

21 Ian Coutts, "Air Defence: Reacquiring a vital capability," *Canadian Army Today*, 27 June 2019.

22 DND, *Ground Based Air Defence*.

23 Ibid.

Staffing and Training

Andrew Hayes, Deputy Auditor General, Office of the Auditor General, explained that "it is not only about acquiring additional fighter jets. You also have to have a plan for having the technicians and the pilots to operate the fleet." The Office of the Auditor General's 2018 report on Canada's Fighter Force identified a shortage of pilots and technicians, leaving it unable to meet NORAD and NATO commitments simultaneously. According to Mr. Swales and Mr. Kasurak, a recent DND report reveals that half of military roles are short-staffed and that "current aerospace readiness is at about 55%." Mr. Hayes and Mr. Swales explained that even if DND achieves its goal of recruiting 200 pilots and 200 technicians, it may still face capacity issues because that goal does not account for staff departures or the age of Canada's aircraft.

Mr. Hayes explained that staffing shortages may be due to the CAF's difficulties with recruiting and the number of older aircraft requiring maintenance. He also suggested that the RCAF's various programs might put strain on personnel numbers and training, and that COVID-19 made recruitment more difficult. James Fergusson, Deputy Director, Centre for Defence and Security Studies, University of Manitoba added that it is difficult to recruit pilots to fly older aircraft. Professor Huebert stated that Canada is losing pilots and that it has not addressed the need to replace pilots who are lost or wounded in combat, both of which highlight the need to have a surplus of pilots.

By contrast, Mr. Crosby and Mr. Williams stated that the neither the RCAF nor DND has problems attracting competent staff. Sylvain Ménard, Chief Fighter Capability, RCAF, DND, also noted that the RCAF was prioritizing its personnel, "emphasizing comprehensive retention strategies, families and quality of life for our members as we focus on culture and change."

In terms of training, Mr. Ménard pointed out that Canada is making investments for the FFCP replacement fighter, but that it is difficult to train staff without knowing which jet Canada will buy. Mr. Page added that Canada launched requests for proposals for the Future Aircrew Training Program in February 2022, but Professor Collins stated that having two training regimens for the CF-18 and F-35 jets will be complex and expensive.

Infrastructure

Mr. Crosby explained that Canada is making progress on infrastructure design and site preparation work for Canadian Forces Bases Bagotville and Cold Lake to house tactical combat squadrons and the training squadron for FFCP aircraft. He and Mr. Ménard

added that those sites are appropriate for either FFCP option and are being designed to net-zero carbon standards while accounting for GBA Plus considerations.

However, Professor Huebert warned that the infrastructure to deploy as well as land Canadian and U.S. aircraft into hangars on Canada's four forward bases, especially in the winter, is "problematic." He added that with the construction of the over-the-horizon radar, Canada would require resupply infrastructure even further north.

Operational Needs and Air Defence Capabilities

Mr. Shimooka emphasized that recent conflicts—especially Russia's invasion of Ukraine—highlight the importance of improving Canada's air defences. Mr. Huebert and Professor Fergusson argued that the modern air security environment—which now poses a system of threats—should guide the development of Canada's specific capabilities. He urged the federal government to give CAF members "the best equipment we can give them, the most advanced equipment, to make a contribution to North American defence, Canadian defence and our allies' defence."

Mr. Ménard and Mr. Collins explained that the RCAF's capabilities are largely determined through interoperability considerations with Canada's allies in NORAD, the North Atlantic Treaty Organization (NATO) and the Five Eyes. However, Professor Fergusson noted the federal government's decisions on air defence procurement projects, including the FFCP and the replacement of the North Warning System, are made around "silo-based interests rather than a broad strategic perspective on the requirements of North American air."

Professor Huebert indicated that air power is increasingly important, but that Canada is unlikely to operate in a context in which it enjoys air superiority, meaning that in future conflicts, the RCAF could suffer losses. Thus, it should be prepared to replace its capabilities as these losses occur. He added that Strong, Secure, Engaged does not provide for hypersonic missile defence and that Russian and Chinese missile technology necessitates advanced radar and anti-ballistic missile capabilities. Professor Huebert also stated that existing anti-missile technologies were built for deterrence, but the threat of tactical nuclear war means that Canada requires "both the shield and the sword," (i.e., the ability to shoot down foreign missiles and bomber aircraft).

Project-Specific Issues

In addition to the general challenges raised above, witnesses told the committee about the strengths and weaknesses of specific air defence procurement projects. This section

summarizes testimony about the FFCP, the Interim Fighter Capability Project and the Hornet Extension Project, the renewal of GBAD capabilities, and NORAD modernization efforts.

Future Fighter Capability Project

Issues Concerning the Procurement Structure

When the committee heard from government officials about the FFCP, Canada had not yet announced its entry into final negotiations with the U.S. government to purchase the F-35. Federal officials could not offer details about the bids, but Mr. Page emphasized that the process had remained fair, open and transparent, that the government was "happy with the recent milestones," and that there had been little frustration. He added that both remaining suppliers meet the capability, cost and value proposition criteria. Mr. Page highlighted how the government mitigated risk by engaging with industry at each step of the process. However, Mr. Crosby commented that due to the FFCP's complexity, including the industry engagement process, the procurement process has been lengthy.

While Professor Nossal agreed that the FFCP competition had been fair to all applicants, he stated that "there's a real logic to the F-35… That's one of the reasons that so many of the other contenders simply said that they were not going to be part of this process." Likewise, Mr. Shimooka explained that the F-35 and the Gripen E are the newest fighter options, and Canada's participation in the JSF made the F-35 a more attractive option. In his view, in 2010, "it would [have] waste[d] taxpayers' dollars to undertake a competition" because the F-35 was the best option. He added:

> Now we fast-forward to 2015 and the current FFCP process. [In 2015], they had to change the evaluation criteria in order to give other options the ability to compete. There was no way for them to compete fairly in a lot of capability areas or in the industrial benefits aspects, or to at least let them have a plausible chance of winning.

Mr. Williams estimated that the process to procure fighter jets could take Canada 12 years, so he contended that the competition should have been run sooner. He also argued that Canada should never have tried to bypass the procurement process to sole-source the jets:

> What happened between 2010 and 2014 with the F-35, fundamentally, was a significant loss of trust in that procurement, as well as in defence procurement writ large. Depending on how this current iteration of the process plays out, I hope that it restores significant trust in the process. That's different, and it's a different airplane. It's had 12 years to mature and evolve.

By contrast, Professor Nossal argued that some of Canada's allies, like Australia and the U.S., had decided to sole-source the F-35, but that "the problem for the sole-source decision [in Canada]… was that it wasn't really explained very well."

However, Professor Huebert argued that the focus on fairness in competitions—and the "time and money that it wastes"—is irrelevant to Canada's security needs. For him, it is more important to promote long-term competitiveness to better address geopolitical threats.

Negotiations with the U.S. Government

Professor Fergusson called the decision to enter final negotiations with the U.S. government "a puzzlement" because of the ambiguity about whether Lockheed Martin had already won, and because a similar strategy in the 1970s had led to a delay in buying the CF-18 aircraft. Moreover, he questioned what is left to negotiate since various details are already determined through Canada's JSF participation. He speculated that Canada may be attempting to secure a domestic repair and overhaul maintenance capability. Mr. Shimooka suggested that Canada could be negotiating delivery times; he and Professor Fergusson specified that Canada is likely fit into a block IV production slot, with delivery by 2025.

Mr. Williams expressed shock that the negotiations could take more than seven months from the date of the announcement, especially given that bidders must meet all terms and conditions to respond to competition proposals. He also said that negotiations for the F-35 would likely go well because "there is too much money at stake, and the terms and conditions are so specified." If negotiations fail with the U.S., the government can turn to the Swedish bid for SAAB's Gripen E. However, Mr. Williams said that if both negotiations fell through, the government would need to restart the process.

Operational Capabilities of Jets

Mr. Ménard explained that the government had determined 88 fighter jets to be the appropriate number to fulfil NORAD, NATO and Arctic sovereignty missions. However, he and Mr. Crosby indicated that Canada's selection process aims to secure versatile jets to maximize the capabilities of Canada's small air force. Mr. Kasurak added that purchasing a second type of plane would have put too much strain on training and maintenance needs.

According to Mr. Perry, "the F-35 is the most advanced fighter jet that's been available to us on the market." He explained that it would increase Canada's continental defences

and support NORAD by improving its surveillance, information sharing and interception abilities, as well as its ability to work with other aircraft and ground or sea assets.

Professor Nossal commented that the only consideration that should matter for selecting Canada's fighter jets is what the Americans are flying—currently, the F-35. Similarly, Mr. Perry noted that many of Canada's close allies have the F-35 so the country can benefit from their experience with it. Professor Huebert and Mr. Perry noted that "several Arctic nations," including Norway, Finland, Denmark and the U.S. (in Alaska) had already purchased the F-35. Professor Huebert also stated that he has no concerns about the F-35 jets' Arctic capabilities.

Professor Leuprecht suggested that the F-35 (a fifth-generation fighter) is the only plane capable of defeating Russian air defences, and Mr. Kasurak added that a fourth-generation fighter would have had limited survivability against Russia.

However, Professor Leuprecht noted that since the F-35 data platform is a significant part of the aircraft, the government needs to modernize its network and develop a data strategy for DND. According to Mr. Kasurak, the F-35 has roughly seven or eight critical deficiencies that are always changing; once one is fixed, it may introduce a new issue. Nevertheless, Professor Collins explained that researchers get better at fixing software and mechanical challenges with each new production block. Mr. Perry stated that buying the F-35 at this stage of its development rather than earlier means that more of its deficiencies have been fixed.

Costs

The committee also heard about the cost of the FFCP jets. According to Mr. Ménard, Canada's high-level budget helped dictate its operational requirements. However, Professor Fergusson stated that the cost estimate "agreed upon between National Defence and the Auditor General's office, in 2012, was… higher to purchase 65 aircraft than the amount that the government has now announced of $19.1 billion … to purchase more aircraft."

Mr. Williams also told the committee that the $19 billion budgeted for the FFCP was inadequate, and that more would be needed for the operation and maintenance costs. Mr. Kasurak noted that the F-35 sustainment costs keep rising and that this factor will be a major problem for the government in determining how much the jets cost. He added that cost estimates for maintenance and repair for the new jets are not public, but would likely be too low. Professor Leuprecht explained that defence project costs

escalate significantly with delays due to defence cost inflation, which is twice as high as for public sector procurement projects – 12% per year as opposed to 6%.

Joint Strike Fighter Industrial Offsets

Various witnesses told the committee about the benefits and drawbacks of the economic offset arrangement of the JSF program. While Mr. Perry noted that all three final FFCP competitors offered "a large package of economic benefits distributed across the country," the F-35 benefits are unique because they encourage "participation in a global fleet of defence products." Mr. Crosby confirmed that Canadian companies had secured roughly US$2 billion in industrial benefits through the JSF program. However, Mr. Perry said that a decision to buy the F-35 earlier would have resulted in even more work.

Professor Fergusson added that most economic offsets appear after a delay, and that most companies created due to those policies disappear after a short time unless they are integrated into U.S. supply chains. However, this is not the case with the JSF program because companies get access to Lockheed Martin's technology and specifications, thus allowing them to link into the supply chain quickly.

The drawback, according to Professor Collins, is that under the terms of the JSF program, it is difficult or impossible for Lockheed Martin to win points for economic offsets in an open competition. He and Mr. Kasurak also commented that economic offsets are hard to measure, so Canadians "should be aware of how these companies can potentially benefit in terms of keeping dollars in-house."

Interim Fighter Capability Project and Hornet Extension Project

The committee also received an update about the Interim Fighter Capability Project. Mr. Crosby indicated that

> all 18 [interim Australian F/A-18 Hornet] aircraft have been received by the department and six have now been released to the Royal Canadian Air Force. Work on the remaining aircraft is progressing, with the eighteenth aircraft scheduled to return to service by June 2023.

Mr. Crosby confirmed that the $339 million cost for that project includes the "Canadianization" modifications needed to meet domestic regulatory requirements.

Concerning the Hornet Extension Project, Mr. Ménard explained that Canada's CF-18 jets were receiving combat capability upgrades, including new radar systems and

modern weapons, "to support our commitments to NORAD and NATO while bridging to the [FFCP]." That modernization includes joint training activities focused on the CF-18 fleet.

North American Aerospace Defence Command (NORAD) Modernization

The committee also heard evidence about how NORAD procurement projects can contribute to the air defence of North America. Professor Fergusson indicated that, rather than the Canadian or the U.S. defence departments, NORAD is leading plans for those projects. Mr. Perry explained that various NORAD initiatives were being considered, including "enhancing our Arctic infrastructure; improving the functionality of our forward operating locations… and replacing the north warning system with a range of modern systems." He also stated that, to respond to hypersonic missile threats, Canada must improve surveillance, tracking and interception capabilities.

Ground-Based Air Defence

Several witnesses also told the committee about Canada's GBAD projects. Mr. Shimooka explained that GBAD "is essential to protect our soldiers from air threats on the battlefield, such as unmanned aerial vehicles," but that it would take Canada eight years or more to field those defences. By contrast, the U.S. developed and fielded similar systems in as little as three years. He suggested that Canada "focus on foundational enablers, such as networking and data links, before addressing sensors and missiles."

Professor Leuprecht and Professor Fergusson indicated that Canada removed its systematic air defence as it downsized, in part because there was no air threat to the CAF in Afghanistan or Iraq and because Canada fights in a coalition. However, current European conflicts are suggesting that GBAD is more important now. Professor Leuprecht cautioned that rebuilding that capability would require significant staff and resources. Mr. Crosby explained that GBAD investments are part of Strong, Secure, Engaged, adding that the $250 million to $499 million cost estimates would become more precise as plans mature.

CANADA'S NATIONAL SHIPBUILDING STRATEGY

Background

To date, the committee has heard compelling testimony about the progress realized toward the National Shipbuilding Strategy (NSS) and the challenges related to that

strategy.[24] This chapter summarizes selected themes that have emerged from those discussions.

In June 2010, the Government of Canada launched the NSS to renew the Royal Canadian Navy (RCN) and CCG fleets over a 20- to 30-year period while fostering long-term, stable and predictable shipbuilding work in Canada. The NSS has three pillars:

- the construction of large vessels, defined as more than 1,000 tonnes of displacement;
- the construction of small vessels, defined as less than 1,000 tonnes of displacement; and
- projects to repair, refit and maintain vessels.

In October 2011, following a competitive Request for Proposal process, the government announced the designation of two shipyards as strategic partners for large NSS vessels. Irving Shipbuilding Inc.'s Halifax Shipyard (Irving) was selected for combat vessels and Seaspan's Vancouver Shipyards Co. Ltd. (VSY) for non-combat vessels. Each shipyard later signed an umbrella agreement, according to which the government awarded contracts for ship design, definition and construction from 2012–2013 onward. In 2019, following a new Invitation to Qualify, the government announced that Chantier Davie had prequalified as the third strategic shipyard and that it would advance to the Request for Proposal and Evaluation stage. That process is not yet complete.

Table 1 shows the progress to date on large NSS projects.

24 The National Shipbuilding Strategy was known as the National Shipbuilding Procurement Strategy until 2016.

Table 1–Large National Shipbuilding Strategy Construction Projects

Vessel Type	Number of Vessels	Budget[a]	First Vessel Delivery[b]	Shipyard(s)
Offshore fisheries science vessels (completed)	3	$788.5 million	2019	Seaspan (Vancouver)
Canadian surface combatants	15	$56 billion to $60 billion[c]	2030–2032	Irving (Halifax)[e]
Arctic and offshore patrol ships[d]	6	$4.3 billion	2020	Irving (Halifax)
Arctic and offshore patrol ships[d]	2	$1.5 billion (under revision)[e]	2026	Irving (Halifax)
Joint support ships	2	$4.1 billion	2023	Seaspan (Vancouver)
Multi-purpose vessels	Up to 16	To be determined[e]	To be determined	Seaspan (Vancouver)
Offshore oceanographic science vessels	1	$966.5 million	2024	Seaspan (Vancouver)
Polar icebreakers	2	To be determined[f]	Before 2030	Seaspan (Vancouver) and Davie (Lévis, QC, pending selection process)

Notes: a. Project budgets are federal government estimates and are subject to change. They do not include costs related to taxes, personnel, operation or maintenance and service (normally calculated over 20- to 30-year periods), unless otherwise specified.
b. Dates listed are federal government estimates and are subject to change. Delivery dates for the first vessel may be months or years before the delivery of subsequent vessels.
c. In his February 2021 report, the Parliamentary Budget Officer (PBO) estimated the cost of the Canadian Surface Combatants at $77.4 billion.
d. According to the Government of Canada, "the amended build contract with Irving Shipbuilding Inc. will deliver six ships. The contract will be further amended for the procurement of two ships for the Canadian Coast Guard."
e. A March 2021 sessional paper suggests that the two Canadian Coast Guard Arctic and Offshore Patrol Ships (AOPS)' cost has risen due to COVID-19. The Prime Minister's 2019 news release estimated the total cost of the two Canadian Coast Guard AOPS and 16 multi-purpose vessels at $15.7 billion.
f. In his December 2021 report, the PBO estimated the Polar Icebreaker Project cost at $7.25 billion.

Source: Table prepared using data obtained from Government of Canada, Large vessel shipbuilding projects.

Challenges and Opportunities in the National Shipbuilding Strategy

The National Shipbuilding Strategy Framework

Some witnesses told the committee about the benefits and drawbacks of the NSS framework. According to Vice-Admiral Craig Baines, Commander, RCN, DND, "[t]he national shipbuilding strategy is the mechanism through which the future fleet will be delivered, and we need to make sure the strategy is well positioned to do it as effectively as possible." However, Mr. Perry acknowledged that "[s]hipbuilding in particular and a lot of aspects of procurement are essentially a series of trade-offs in order to make the least bad decisions, not ones that are inherently perfect ."

Mr. Page and Mr. Swales suggested that the NSS framework is appropriate for selecting strategic partners and sustaining consistent work for Canada's shipbuilding industry across different regions. Mr. Page highlighted that it provides work for large and small shipyards alike. Mr. Page also noted that NSS contracts awarded between 2012 and 2021 contributed $21.2 billion to Canada's gross domestic product and maintained more than 18,000 jobs per year. However, Shaun Padulo, President, Heddle Shipyards, told the committee that Ontario, despite being Canada's largest province, is not included "in the NSS in a meaningful way." The committee notes that this is largely due to the province's lack of proximity to the coasts.

Several experts agreed that fostering domestic shipbuilding capacity through the NSS was an important strategic choice.[25] Timothy Hiu-Tung Choi, Consultant, Research Fellow, Doctoral candidate, University of Calgary, acknowledged that if Canadian shipyards have excess capacity, they could supply Canada's allies. He added that domestic shipbuilding capacity provides Canada with leverage among its NATO allies and allows it to better support its northern communities.

As described in this chapter, opinion was mixed about the NSS' ability to meet the operational needs of the RCN and CCG. Witnesses pointed to interrelated challenges concerning the timely delivery and cost of NSS projects; federal transparency; shipyard capacity; staffing and expertise; and vessel design to meet Canada's operational needs.

25 OGGO, *Evidence*, 29 March 2022 (Mr. Perry, 1725); *Evidence*, 1 April 2022 (Professor Collins, 1425); and *Evidence*, 8 April, 1345 (Timothy Hiu-Tung Choi, Consultant, Research Fellow, Doctoral Candidate, University of Calgary, 1345 and Mr. Norman, 1350).

Timely Delivery

In its 2021 report, the Office of the Auditor General of Canada found that "the national shipbuilding strategy was slow to deliver the combat and non-combat ships that Canada needs." Mr. Hayes and Mr. Swales attributed delays to a lack of contractual protections, realistic plans and measurable risk mitigation strategies. Mr. Perry stated that the government had not prioritized the timely delivery of NSS projects, suggesting this was indicative of a "systemic problem" with ship procurement.

Mr. Page and Mr. Smith acknowledged that vessel delivery was slower than anticipated. They explained that delays were due to a shortage of expertise at shipyards and in government—which caused various spill-over effects—as well as interruptions due to COVID-19 and related supply chain issues. Neither Mr. Page nor Mr. Perry could say to what extent COVID-19 and supply chain issues disrupted work. However, Mr. Page anticipated schedule revisions for future vessels.

According to Mr. Kasurak, the NSS strategy of "trying to stretch out delivery in order to have an ongoing, long-standing defence industry" compounds the delays. In response to a member's question, he noted that establishing a strategic partnership with a third shipyard earlier on could have sped up delivery. Professor Sloan suggested that timeliness could be improved by adopting agile procurement (i.e., applying business principles to procurement), giving the Minister of National Defence responsibility for defence procurement and increasing the number of federal procurement staff.

Mr. Hayes, Mr. Perry, Mr. Page and Mr. Crosby all noted that timely delivery would result in stronger capabilities and better affordability. Mr. Hayes added that the most important pieces are "reaching target state to be able to produce the ships according to the time frames and requirements that are outlined." VAdm Baines expressed concern that delayed deliveries also make it difficult to bridge the new vessels with those they are replacing.

Costs

According to Mr. Page and Mr. Smith, factors affecting the rising cost of NSS projects include Canada's limited experience in planning shipbuilding projects; vessel design complexities; "refinements in build requirements and plans; inflation costs; changes in exchange rates or labour rates; and material costs—all of which have risen significantly over the last decade." However, Mr. Page noted that the government is working with third parties to ensure the shipyards' added costs are justified. Mr. Kasurak, Professor Collins and Mr. Choi highlighted the difficulty of estimating costs for the Canadian Surface Combatants.

Mr. Williams stated that the government is "financially incapable" of supporting the Canadian Surface Combatants' life-cycle cost, which he estimates at $240 billion. He argued that the government had failed to follow proper procurement principles and that it has allowed Irving too much autonomy in decision-making without any budgetary constraints.

Mr. Kasurak and Professor Collins agreed that the government made trade-offs when it allowed Irving to act as prime contractor. However, Mr. Kasurak argued that cost increases were mostly due to "the initial state of the shipyard, the state of our labour force and the complexity of the weapons system we're trying to build." Professor Collins explained that commodity prices are being driven up because Canada's allies are rebuilding naval capacity simultaneously. Mr. Shimooka pointed out that Canada's allies experienced similar cost increases for their frigate programs. However, he warned that there are few opportunities for cost savings and that further delays would incur higher costs.

Achille Fulfaro, Senior Vice-President, Sales, Fincantieri, explained that his company's strategy is to propose a fixed price when responding to a shipbuilding tender process. In his view, this approach is optimal as it allows bidders to define the scope of the work, the timeline and the quality of the product from the project's outset. He added that there is still flexibility with this approach since the price could always be modified during the course of the project.

Shipyard Capacity

Witnesses also commented on shipyards' capacity to execute NSS projects. Professor Sloan, Mr. Hayes, Mr. Kasurak, Mr. Choi and Mr. Perry all emphasized the importance of finding an appropriate balance of work for partner shipyards, including having the right number of shipyards and planning enough work to sustain them after existing projects end. Mr. Padulo explained that integrating Heddle Shipyards into the NSS would provide "a continuity of work for Heddle and Ontario which will eliminate the boom-and-bust cycles and allow Heddle to continue to be a supplier that Canada can have to deliver projects on time and on-budget."

Professor Huebert noted that the NSS does not address the infrastructure needed to support shipbuilding. Mr. Perry maintained that because the government has managed the NSS as individual projects rather than an interdependent program of work, it is missing out on potential efficiencies. Professor Sloan explained that the government did not have the staffing capacity to act as the prime contractor for the Canadian Surface Combatant program, leaving Irving to manage it, which in turn resulted in cost increases.

Mr. Page told the committee that the government's rigid governance system allows for federal reviews of shipyards' labour forces, supply chain challenges, schedules and costs, but noted that some factors are out of the government's control. He and Mr. Crosby added that the government has regular conversations with shipyards and their major subcontractors to support them on key issues, such as generating economies of scale. In addition, Mr. Hayes stated that the government aimed to alleviate time pressures by changing shipyards' build order and adding a third partner shipyard. Mr. Page also noted that the government is continuously considering policy changes to optimize NSS output, including how small shipyards can contribute more.

Staffing and Expertise

Witnesses also identified a demand for professional shipbuilding and procurement skills. Professor Collins stated that Canada's allies are all experiencing staffing challenges. He added that Canada has no procurement training programs and that human resource issues are exacerbated by the industry's boom-and-bust cycle. The committee notes that the NSS works to address these cycles with a clear and long-term ship build schedule.

All sectors are experiencing staffing shortages. Mr. Perry pointed to a shortage of skilled blue- and white-collar labour in the marine industry. Mr. Page explained that PSPC is helping the marine sector develop a new human resources strategy. Similarly, Mr. Swales noted that certain ITB requirements under the NSS require shipyards and the defence industry to build human resources capacity.

Likewise, Professor Leuprecht stated that the CAF, especially the RCN, have specific trades shortages, although Mr. Swales noted that staff training and recruitment for the RCN and CCG are not part of the NSS. Nevertheless, VAdm Baines explained that the RCN is developing an inclusive and diverse corporate culture to attract and retain staff.

Operational Needs and Vessel Design

VAdm Baines explained that Canadian vessels may be used for a range of purposes, including "humanitarian assistance, disaster relief, naval diplomacy, deterrence or combat." In light of these diverse operational needs, and as summarized in this section, several witnesses told the committee about how Canada meets the RCN and CCG's operational needs through vessel design.

Mr. Choi warned that off-the-shelf production "covers up a lot of minute details that dictate the timetable, time frames and costs" and that "in some cases, working from a clean sheet design is easier than modifying an existing one." Mark Norman, Vice-Admiral

(Retired), believed that off-the-shelf technologies could sometimes be procured more rapidly while other times, modifications to meet Canadian needs are "a necessary evil."

Mr. Williams argued that many of the Canadian Surface Combatant program difficulties are based on the vessels' unproven design and that it is possible to demand modifications to more mature, proven systems. Mr. Perry added that extensive design modifications can require changes to all combat systems, which poses integration challenges. Professor Leuprecht, however, argued that the modifications to the Canadian Surface Combatant are reasonable. He maintained that Canada's vessel design should be based on interoperability with its allies and on Canada's specific needs, while cautioning that modifications require appropriate oversight and accountability to taxpayers.

Professor Collins pointed out that countries that primarily design and build ships for themselves do not require country-specific modifications. Although Mr. Swales noted that complex vessel designs increased costs, Mr. Hayes predicted that the cost of each ship of the same class would drop as shipyards gained experience in building them.

Mr. Kasurak stated that building NSS ships in Canada was a strategic choice and that it is likely too late to outsource construction abroad. Professor Collins added that Canada would need to pay a premium to be added into other countries' production lines. Similarly, Mr. Choi and Mr. Norman suggested that outsourcing production would not be ideal.

Lastly, in response a committee member's question, Mr. Fulfaro said that in 2016, Fincantieri wrote a letter to the Minister of PSPC expressing its concerns with the management of intellectual property during the different phases of Canadian Surface Combatant program. He added that the phases of the program and the division of responsibilities, including the transfer of technology, between the prime contractor, the bidders and the Canadian government within each phase, were unclear. The committee notes that Fincantieri's bid for the Canadian Surface Combatant procurement process was rejected because it was submitted outside the formal request for proposal process.

CONCLUSION

During the first eight meetings of its two studies on defence procurement, the committee heard about many challenges affecting the federal government's capacity to acquire expensive and complex military equipment. This interim report has summarized witness testimony about Canada's air defence procurement projects and the National Shipbuilding Strategy. The committee looks forward to hearing from its remaining

witnesses and deliberating and offering its recommendations to the government and specific departments as to how this process can be improved going forward.

APPENDIX A
LIST OF WITNESSES

The following table lists the witnesses who appeared before the committee at its meetings related to this report. Transcripts of all public meetings related to this report are available on the committee's webpage for this study.

Pursuant to the motion adopted by the committee, this interim report comprises only testimony and documentation received by the committee up to and including Tuesday, May 3, 2022.

AIR DEFENCE PROCUREMENT PROJECTS

Organizations and Individuals	Date	Meeting
Office of the Auditor General	2022/02/15	6
Andrew Hayes, Deputy Auditor General		
Nicholas Swales, Principal		
Department of National Defence	2022/03/22	9
Troy Crosby, Assistant Deputy Minister, Materiel Group		
Sylvain Ménard, Chief Fighter Capability, Royal Canadian Air Force		
Department of Public Works and Government Services	2022/03/22	9
Simon Page, Assistant Deputy Minister, Defence and Marine Procurement		
As an individual	2022/03/29	11
Christian Leuprecht, Professor, Royal Military College, Queen's University		
David Perry, President, Canadian Global Affairs Institute		
Alan Williams, President, Williams Group		

Organizations and Individuals	Date	Meeting
As an individual	2022/04/01	12
Jeffrey Collins, Adjunct Professor, University of Prince Edward Island		
James Fergusson, Deputy Director, Centre for Defence and Security Studies, University of Manitoba		
Peter Kasurak, Fellow, Centre for International and Defence Policy, Queen's University		
As an individual	2022/04/05	13
Robert Huebert, Fellow, Canadian Global Affairs Institute		
Kim Richard Nossal, Professor Emeritus, Queen's University		
Richard Shimooka, Senior Fellow, MacDonald-Laurier Institute		

APPENDIX B
LIST OF WITNESSES

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NATIONAL SHIPBUILDING STRATEGY

Organizations and Individuals	Date	Meeting
Office of the Auditor General	2022/02/15	6
Andrew Hayes, Deputy Auditor General		
Nicholas Swales, Principal		
Department of Fisheries and Oceans	2022/03/25	10
Andy Smith, Deputy Commissioner, Shipbuilding and Materiel, Canadian Coast Guard		
Department of National Defence	2022/03/25	10
Craig Baines, Commander, Royal Canadian Navy		
Troy Crosby, Assistant Deputy Minister, Materiel Group		
Department of Public Works and Government Services	2022/03/25	10
Simon Page, Assistant Deputy Minister, Defence and Marine Procurement		
As an individual	2022/03/29	11
Christian Leuprecht, Professor, Royal Military College, Queen's University		
David Perry, President, Canadian Global Affairs Institute		
Alan Williams, President, Williams Group		

Organizations and Individuals	Date	Meeting
As an individual	2022/04/01	12
Jeffrey Collins, Adjunct Professor, University of Prince Edward Island		
Peter Kasurak, Fellow, Centre for International and Defence Policy, Queen's University		
As an individual	2022/04/05	13
Robert Huebert, Fellow, Canadian Global Affairs Institute		
Richard Shimooka, Senior Fellow, MacDonald-Laurier Institute		
Elinor Sloan, Professor, Department of Political Science, Carleton University		
As an individual	2022/04/08	14
Timothy Hiu-Tung Choi, Consultant, Research Fellow, Doctoral Candidate, University of Calgary		
Mark Norman, Vice-Admiral (Retired)		
Fincantieri	2022/05/03	17
Achille Fulfaro, Senior Vice-President, Sales		
Heddle Shipyards	2022/05/03	17
Shaun Padulo, President		

APPENDIX C
LIST OF BRIEFS

The following is an alphabetical list of organizations and individuals who submitted briefs to the committee related to this report. For more information, please consult the committee's webpage for this study.

Pursuant to the motion adopted by the committee, this interim report comprises only testimony and documentation received by the committee up to and including Tuesday, May 3, 2022.

AIR DEFENCE PROCUREMENT PROJECTS

Williams, Alan

APPENDIX D
LIST OF BRIEFS

The following is an alphabetical list of organizations and individuals who submitted briefs to the committee related to this report. For more information, please consult the committee's webpage for this study.

Pursuant to the motion adopted by the committee, this interim report comprises only testimony and documentation received by the committee up to and including Tuesday, May 3, 2022.

NATIONAL SHIPBUILDING STRATEGY

Williams, Alan

MINUTES OF PROCEEDINGS

Pursuant to the motion adopted by the committee, this interim report comprises only testimony and documentation received by the committee up to and including Tuesday, May 3, 2022.

A copy of the relevant *Minutes of Proceedings* (Meetings Nos. 6, 9, 11, 12 and 13) in relation to the study of the air defence procurement projects and (Meetings Nos. 6, 10, 11, 12, 13, 14 and 17) in relation to the study of the National Shipbuilding Strategy is tabled.

Respectfully submitted,

Robert Kitchen, M.P.
Chair