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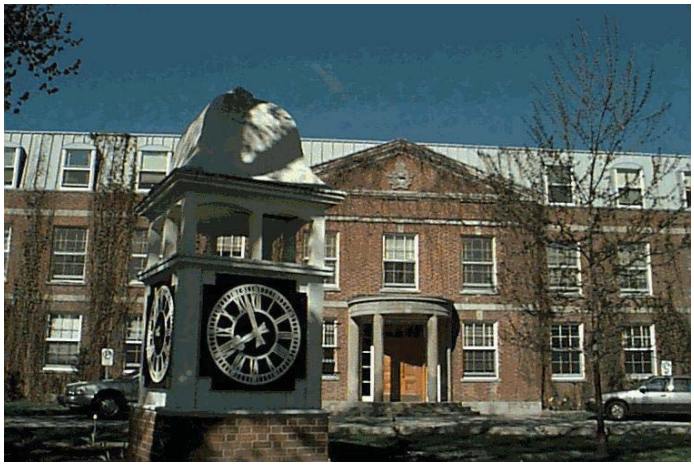

BEYOND JENKINS: DEVELOPING DND'S DEFENCE INDUSTRIAL BASE REQUIREMENTS

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ABSTRACT

This paper argues that the Department of National Defence (DND) should articulate its needs from defence industry is support of the sustainment of the Canadian Armed Forces (CAF) and its future operational success. Based on these needs, the Government of Canada would have the rationale and choice to intervene in the defence industry to achieve the long term needs of DND, notwithstanding its interventions in support of its national economic interests. The recent focus in Canada on DND's immediate procurement needs, while justifiable, inhibit dialogue about its long term industrial needs which may be necessary to support the sustainment of the CAF. This paper supports its argument for increased intervention in the defence industrial base through examination of the Government of Canada's history of intervention in the defence industry as well as Australia's defence industrial strategy. This paper also proposes a framework by which DND could identify its defence industrial base needs in consultation with other government and industry stakeholders constructed from the Capability Based Planning and Defence Industrial Preparedness processes. The outputs of this framework could include a set of DND-prioritized key industrial capabilities (KICs), a list of Assured and Strategic Sources of supply, and their procurement approaches which would underpin the necessary long term industrial relationships. This paper concludes that Government of Canada intervention in the defence industry in support of DND will enable it to support the future preparedness, agility, and effectiveness of the CAF.

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BEYOND JENKINS:

DEVELOPING DND'S DEFENCE INDUSTRIAL BASE REQUIREMENTS

CHAPTER 1 - INTRODUCTION

In February 2013, Tom Jenkins, Special Advisor to the Minister of Public Works and Government Services, released a report entitled *Canada First: Leveraging Defence Procurement through Key Industrial Capabilities*, also known as the Jenkins Report.[1] The Jenkins Report subsequently served as a basis for the Federal Government's new Defence Procurement Strategy, released the following year, which was the most significant procurement strategy update issued in decades.[2] While the Jenkins Report sought to balance the competing requirements of defence procurement stakeholders, this paper suggests that there was one key stakeholder whose requirements were inadequately represented in the final report: the Department of National Defence (DND). This is not to suggest any criticism on the four principal authors of the report or their methodology, who should be applauded for trying to balance a supply and demand equation with the demand side missing. This absence was indirectly highlighted in Industry Canada's Value Proposition Guide, which called for DND to "develop a list of key industrial capabilities required in Canada for operational and security reasons."[3] In the further absence of "…a permanent Defence Analytics Institute to refine [the Government's] understanding of key

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[1] Tom Jenkins, *Canada First: Leveraging Defence Procurement through Key Industrial Capabilities* (Canada: Public Works and Government Services Canada, 2013).
[2] Canada, Public Works and Government Services Canada, "Defence Procurement Strategy," accessed July 26, 2016, http://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/samd-dps/index-eng.html.
[3] Canada, Industry Canada. *Industrial and Technological Benefits Policy: Value Proposition Guide* (Ottawa, CA: Industry Canada, 2014), https://www.ic.gc.ca/eic/site/086.nsf/vwapj/VPGuideEng.pdf/$file/VPGuideEng.pdf.

industrial capabilities,"[4] this paper proposes a framework by which DND could develop the requested list of DND's list of Key Industrial Capabilities (KICs). But KICs are only the tip of Government intervention in the defence industrial base that DND may require. The purpose of this paper is to argue that DND should articulate its needs from defence industry in support of the sustainment of the CAF and its future operational success.

Methodology

This paper supports this argument by reviewing the historical precedents for government intervention in the defence market, which is neither a new idea in Canada, nor an untested one, to demonstrate that there is a justified and acceptable basis for this intervention on behalf of DND. This paper also examines the example of the Australian Government's market intervention to demonstrate that the case for intervention remains strong in the modern procurement and technological era, and that intervention remains an achievable goal. On the basis of these two examinations, this paper articulates the modern day rationale for requesting government intervention in the defence industrial base in support of sustainment, based on the factors of preparedness, agility, and effectiveness. This paper proposes an analytical framework by which DND can work with other defence industrial stakeholders to develop a coherent demand for government intervention in the defence industrial base including: a set of DND-prioritized KICS, a list of Assured and Strategic Sources of supply, and the supporting procurement practices necessary to enable these long term industrial relationships

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[4] *Ibid.*; Craig Stone, "Prioritizing Defence Industry Capabilities: Lessons for Canada from Australia" (Calgary, Canada: Canadian Defence & Foreign Affairs Institute, 2014), 2, https://www.policyschool.ca/wp-content/uploads/2016/03/defence-capabilities-stone.pdf.

Chapter Descriptions

In the second chapter, this paper looks at the definitions and theory which define defence industry, including the defence industrial base, defence industrial strategy, and sustainment. In the third chapter, this paper examines the history of defence industrial strategy in Canada, including: the World Wars, the Cold War, the National Shipbuilding Strategy, the Munitions Supply Program, the North American defence industrial base, the National Security Exemption, Industrial Regional Benefits, the Jenkins Report, and Industrial Technical Benefits. In the fourth chapter, this paper considers a near-peer ally, Australia, who has already taken a defence-minded approach to its defence industrial strategy. In the fifth chapter, this paper examines why DND should articulate its own requirements for government intervention in support of the sustainment of the CAF. In the sixth chapter, this paper outline a methodology by which DND can establish its own industrial demands, by leveraging the current Capability Based Planning process and the previously established Defence Industrial Preparedness Process. Together, these chapters provide support to this papers argument that DND should develop and articulate its own long-term requirements for the defence industrial base.

CHAPTER 2 - DEFENCE INDUSTRIAL BASE DEFINITIONS

Introduction

This chapter discusses the definitions of key terms fundamental to understanding the Canadian Government's relationship with defence industry, including: defence industrial base, defence industrial strategy, and sustainment. Understanding the definitions for these terms as employed within this paper is important because the definitions can change subtly depending on the context they are use in, or similar words used in their place.

Defence Industrial Base

Of the terms to be defined in this chapter, the concept of the defence industrial base (DIB) is the most difficult to demarcate, as will be discussed using work from Dr. Solomon as well as the Jenkins Report. Dr. Binyam Solomon, a leading Canadian defence economics researcher at Defence Research and Development Canada's Centre for Operational Research and Analysis, noted that there was no single definition of the Canadian DIB because "it is dependent on the research question asked and how one wants to operationalize the definition."[5] However, Solomon also offered his own definition in *The Public Management of Defence in Canada*, a foundational publication within the defence bureaucracy. He defined the Canadian DIB based on the following criteria: companies which are both dependent on military production and are important suppliers; companies which are dependent on domestic or foreign defence spending, and

[5] Binyam Solomon, "The Defence Industrial Base in Canada," in *The Public Management of Defence in Canada*, ed. by Craig Stone (Toronto, Canada: Breakout Educational Network, 2009), 111.

the nation state is dependent on the company; and companies which may be operating non-competitively due to economies of scale, technology, or government policies.[6] A second key reference point for defining the DIB comes from another foundational publication, the Jenkins Report. In this landmark report, the authors avoided referring to the Canadian "defence industrial base," and instead relied on the term "Canadian (or Canada's) defence-related industries."[7] While the term is never explicitly defined, its usage in the report denotes a greater inclusiveness than suggested by Solomon, and may explain its employment. This paper therefore employs three definitions which include the breadth of these concepts, while permitting differentiation as well. These are: the Canadian DIB, the DIB, and DND's DIB.

Canadian DIB. The Canadian DIB is defined as comprising all suppliers with locations in Canada, who provide any defence materiel or services, either unique or dual-use, to any sovereign state.

DIB. The DIB is defined as comprising all suppliers, independent of location, who provide any defence materiel or services, either unique or dual-use, to any sovereign state.

DND's DIB. DND's DIB is defined as comprising all suppliers, independent of location, who may provide any defence materiel or services, either unique or dual-use, to DND.

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[6] *Ibid*., 112.
[7] Jenkins, *Canada First,* xii.

Defence Industrial Strategy

The second term of this chapter, Defence Industrial Strategy (DIS) is sometime used synonymously with the term Defence Industrial Policy. For example, Dr. Craig Stone, a professor at the Canadian Force College and leading DIS researcher, "uses the term policy and strategy interchangeably although in many cases a strategy is what one designs to implement a policy. Neither exists right now and either one would be useful."[8] The *Canada First Defence Strategy* is an example of a document labelled as a strategy, but is used almost as if it is a formal policy statement.[9] This paper defines DIS as that which provides guidance to defence industry and government bureaucrats on the extent and nature of government intervention in the DIB. This is derived from the work of Hix, Held, and Pint from the RAND Corporation who characterized a defence industrial policy as one which must address the following:

1. Which items will be manufactured domestically?
2. To what extent will the base be subject to competition?
3. To what extent will the government subsidize a privately-owned base?
4. Will private firms in the base be permitted to fail financially [10]

As Stone noted, "a defence industry policy statement is something that has never been done in Canada."[11] In the absence of a holistic, integrated DIS, this paper considers the

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[8] Craig Stone, "Canada needs a Defence Industrial Policy," *International Journal* 63(2) (2008), 342, http://www.jstor.org/stable/40204367.
[9] Stone, "Defence Industrial Capabilities," 2.
[10] W. Michael Hix, Bruce Held, and Ellen Pint, *Lessons from the North: Canada's Privatization of Military Ammunition Production* (Santa Monica, USA: RAND Corporation, 2004), 3.
[11] Stone, "Australia," 2.

bits and pieces of industrial policy and strategy that do exist, as the current state of the DIS in Canada.

Ammunition Example. Hix, Held, and Pint use a piece of Canada's fragmented DIS, ammunition production, as a case study to explain how the four questions listed above characterize the DIS, and thereby influences the DIB. For example, when the Government decided to privatize its ammunition facilities, it first tried to do so using an open, lowest compliant bidder competition. This approach was blamed for leading to the bankruptcy of the Valleyfield ammunition plant. In the next round of privatizations, the Government used a closed competition, resulting in healthier bidders and thereby regaining the CAF's confidence in the health of the ammunition supply chain. At the same time, by the Government's refusal to save the Valleyfield ammunition plant from bankruptcy, the plant became more productive as "bankruptcies often mean only financial reorganization from which the firm emerges stronger than before."[12] As a final example from this case study, when cost-plus contracts were initially introduced in 1986, they "lacked incentives for improved productivity," and due to their lack of competitiveness, the companies remained dependent on sole-source government contracts. When SNC and "the government agreed to new contract vehicles that provided incentives for the firm to become more efficient and share in the rewards of improved productivity," it was able also compete in the open, global marketplace as well.[13] This case study therefore, in correlation to the four questions listed above, illustrates how government is capable of intervening in the functioning of the defence industrial base. It underlies the point that

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[12] Hix, Held, and Pint, *Ammunition*, xxi.
[13] *Ibid*., xxiii.

DIS is a policy tool by which the behaviour of defence industry may be influenced to meet the objectives of government policy.

Readiness and Sustainment

The two other closely related terms to be discussed are readiness and sustainment. As the definition of these terms can vary depending upon the context in which they are used, this section will clarify how these terms are used in this paper, as they are fundamental to understanding its arguments. The terms are often used together due to their close functional relationship, for example, "readiness and sustainability, which reflect approximately how quickly and for how long forces would be usable…."[14] However, this combined usage, arguably more frequent in recent times, can blur their definitions, whereas "readiness and sustainability have traditionally been considered distinct…"[15]

Readiness. The concept of readiness is "…intended to reflect more or less the initial capability of units and forces; it is represented primarily through reports of the resources that units hold." Examples of readiness metrics which are used to measure the capability state of a unit are by "equipment and supplies on hand, equipment condition, available personnel, [and] training…."[16] The danger of confusing readiness with sustainment, is that without sustainment, which is the focus of this paper, the readiness of the operational capability could quickly depreciate.

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[14] Craig Moore et al., "Measuring Military Readiness and Sustainability" (Santa Monica, USA: RAND, 1991), v, http://130.154.3.8/content/dam/rand/pubs/reports/2007/R3842.pdf.
[15] *Ibid*., 10.
[16] *Ibid*., 5.

Sustainment. US joint doctrine defines sustainment as "…the provision of logistics and personnel services necessary to maintain and prolong operations until mission accomplishment and redeployment of the force."[17] Without sustainment, forces are unlikely to be able to deploy, and could not maintain operations for any length of time. Therefore, "the relative combat power that military forces can generate against an adversary is constrained by a nation's capability to plan for, gain access to, and deliver forces and materiel to required points of application."[18] However, despite these holistic, strategic descriptions, sustainment is often considered as only being concerned with "the numbers of 'days of supply' (DOS) held in stockpiles," or the amount of "ammunition, fuel, and spare parts…."[19] This paper considers sustainment without such colloquial restrictions, but instead as a function which provides "freedom of action, endurance and the ability to extend operational reach [and] to seize, retain, and exploit the initiative."[20] This includes a wide conception of the "production or repair pipelines…" and "industrial mobilization" necessary to satisfy campaign level operations. As it is the "industrial base capacity [which] enables sustained operations," it is therefore true that, in the case of the US military, "the DOD's supply chain responsiveness and reliability affects the readiness and capabilities of US military forces and is critical to the overall success of joint operations."[21] This paper therefore focusses on the capacity of DND's DIB which, as a predominant element of sustainment, is vital for the CAF to achieve operational success.

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[17] U.S. Joint Chiefs of Staff, *Joint Logistics, Joint Publication 4-0* (Washington, DC: U.S. Joint Chiefs of Staff, 2013), I-1, http://www.dtic.mil/doctrine/new_pubs/jp4_0.pdf.
[18] *Ibid*.
[19] Moore et al., "Sustainability", viii.
[20] U.S. Joint Chiefs of Staff, *Joint Logistics*, I-5.
[21] *Ibid*.

CHAPTER 3 - CANADA'S DEFENCE INDUSTRIAL STRATEGY

Introduction

Having established key definitions regarding defence industrial strategy in the previous chapter, Chapter Three examines crucial aspects of the Government of Canada's 150-year relationship with defence industry. It discusses several instances when the Government has acted to intervene in the defence supplier marketplace. The purpose of this chapter is to demonstrate that there are strong precedents to this paper's call for Government intervention in the DIB, and that a persistent rationale exists for the Government to do so in support of DND's sustainment needs. This chapter will therefore look at: defence industry during major conflicts; the National Shipbuilding Strategy; the Munitions Supply Program; the North American DIB; the National Security Exception; Industrial Regional Benefits Policy; the Jenkins Report; and Industrial and Technological Benefits Policy.

History of Defence Industrial Strategy in Canada

Having previously established in this paper that the Government of Canada does not have a DIS, and has never issued one, it is also true that Canada did not start life with one 150 years ago either. Canada simply "had no urgent need to concern itself with [a defence] industrial base," as anything it needed, it could import from close allies such as England and the United States.[22] However, this view began to change as Canada realized it could not rely on foreign suppliers for multiple reasons. The ammunition industry again

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[22] Hix, Held, and Pint, *Ammunition*, 26.

provides a fitting case study for changes in the Canadian DIS. In the 1870s, "British arsenals became overcommitted supporting imperial activities overseas, making them less able to meet possible Canadian needs." During the Boer War, Canadian were affected by "quality and schedule problems" at British ammunition factories. During the Second World War, "industry in England was under the constant threat of attack" by air or sea.[23] Finally, in 1978, the Canadian Government launched the Munitions Supply Program to "maintain domestic sources of supply for ammunition, since in times of conflict foreign ammunition producers were likely to divert production from exports to their own national requirements and might not be inclined to adapt their products to meet Canadian specifications."[24] This Munitions Supply Program is still in effect to this day and is discussed in greater detail later in this chapter.

World Wars. One of this paper's key arguments, is that if DND's requirements from the defence industrial base are not implemented in advance, then should the need arise, the CAF will be inhibited in meeting its requirements for the defence of Canada's interests at home and abroad. The World Wars are extreme examples of this argument, but their industrial problems can be extrapolated to smaller, regional conflicts, and therefore are important to include. In the First World War, while the total output of Canada's industries was significant,[25] the key issue was that the industrial expansion required to reach the necessary capacity "was exceeding slow and expensive, due primarily to the absence of a substantial defence industrial base upon the outbreak of war

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[23] *Ibid*., 28.
[24] *Ibid*., 34.
[25] "In all, Canada manufactured 65 million shells, 49 million cartridge cases, 30 million fuses, 112 million pounds of explosives, 2900 airplanes, and 88 ships." Canada, *Defence Industrial Preparedness: A Foundation for Defence*. (Ottawa, Canada: Minister of Supply and Services Canada, 1987), 1-1.

in 1914."[26] Furthermore, "this was all produced at the behest of the Imperial Munitions Board, a British organization formed to oversee British contracts in Canada," and following the war, "Canada's defence industrial base was dismantled."[27] In the Second World War, while again producing significant total output, Canada was also forced to mobilize its manufacturing capacity starting from "only the barest trace of a defence industrial base."[28] In 1935, Canada had formed a Navy, Army and Air Supply Committee "to explore the sources of supply of material necessary to meet the requirements of the Canadian Forces in an emergency…." However, this was not a focus of the Government, which was more interested in "limiting profit margins to 5 percent."[29] Even after Canada declared war in September 1939, "the government continued to apply peacetime financial standards to a war situation," which contributed to "Canada's slowly expanding industrial effort." In both cases therefore, "the lack of pre-war preparation… contributed directly to the long length of time required to mobilize Canadian industry for large-scale defence production."[30] Placing its production numbers in perspective of its two close allies, the US and the UK, Canada only manufactured a small percentage of the material needs of the Second World War, and where "Canadian industry was unable to produce in sufficient volume some of the more sophisticated weapons and engines required," such as aircraft and tank engines.[31] In 1941, the Hyde Park Declaration, directed Canada and the

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[26] "…Canadian industry had produced 487 naval escort ships, approximately 17 000 aircraft, 38 000 tanks and armoured vehicles, 816 000 military wheeled vehicles, …necessary for the Allied war effort." *Ibid*., 1-2.
[27] William Johnston, "Canadian Defence Industrial Policy and Practice: A History," *Canadian Defence Quarterly* 18(6) (1989), 21.
[28] Canada, *Defence Industrial Preparedness, 1-2.*
[29] Johnston, "Canadian Defence Industrial Policy," 21.
[30] Canada, *Defence Industrial Preparedness, 1-2*
[31] Johnston, "Canadian Defence Industrial Policy," 24.

US "to buy military goods from the other on the basis of complementarily [sic], competitive advantage, and specialization, leading to "a total of 8.65 billion (in 1990 U.S. dollars)" of equipment procured from across the border.[32] While the industrial base was once again dismembered following the end of the war, it was briefly recreated to support the five billion dollar rearmament programme needed for the Korean War of the early 1950s.

Cold War. The decades-long Cold War in the twentieth century introduced a mindset into DND where little importance was attached to its defence industrial base. As Dr. Cannizzo, a member of the Directorate of Defence Industrial Resources in NDHQ asserted in the late 1980s, "while NATO remained dependent on nuclear weapons for both deterrence and defence, the industrial base was of little consequence."[33] This was due to NATO's adoption of a short war strategy based on "a short East-West conflict in which nuclear weapons would be used from the outset…and would not, therefore, require a large industrial base to support it."[34] DND "realized that it could reduce the cost of procurement by purchasing equipment abroad…and only needed a sufficient technical capacity to maintain the weapons that were purchased off-shore," leading to cancellation of such projects as the Avro Arrow.[35] This revised NATO strategy thus led to US and Canadian Government support for a North American DIB through the *Defence*

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[32] U.S. Congress, Office of Technology Assessment. *Redesigning Defense: Planning the Transition to the Future U.S. Defense Industrial Base, OTA-ISC-500* (Washington, DC: U.S. Government Printing Office, 1991), 108, https://www.princeton.edu/~ota/disk1/1991/9134/913408.PDF.
[33] C.A. Cannizzo, "The Federal Government and Defence Industrial Preparedness," *Canadian Defence Quarterly* 18(6) (1989), 38.
[34] Johnston, "Canadian Defence Industrial Policy," 25.
[35] *Ibid*., 25.

Production Sharing Agreement between Canada and the United States, which remains extant today and will be discussed further in this Chapter.[36]

End of the Cold-War. As the last decade of the Cold War began, NATO once again undertook a major change of strategy. This time, it believed that the capacity to continue fighting a conventional warfare would decrease the probability of entering a nuclear one. Therefore, NATO had "once again been reoriented to include the possibility of an East-West conflict lasting longer than the thirty-day, short war, scenario."[37] By 1981, the Canadian Government had directed its departments to plan "the establishment of National Emergency Agencies in the event of a national crisis," in preparation for another long war. In 1985, DND set up the Defence Industrial Preparedness Task Force (DIPTF) to report on how defence industrial preparedness should be conducted. This overlapped with a new defence white paper that provided policy coverage for the development of a DIS to support the Readiness and Sustainment of the CAF.[38] The DIPTF released its finding in 1988, one year before the fall of the Berlin Wall.[39] Its key recommendations were never implemented, most likely as the major procurement programmes that would have underpinned the new DIS never materialized, due to the budget cuts that accompanied the end of the Cold War. This paper, however, posits that the analysis and recommendations contained within the DIPTF's report remain viable and newly relevant as Canada once again prepares to confront a future security environment

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[36] *Defence Production Sharing Agreement between Canada and the United States of America*. July 27, 1956. http://www.ccc.ca/~/media/PDF%20Documents%20-%20Versioned%20-%20English-French/Exporters/DPSAe.pdf?la=en.
[37] Johnston, "Canadian Defence Industrial Policy," 26.
[38] Stone, "Defence Industrial Policy," 345.
[39] Canada, *Defence Industrial Preparedness.*

with multiple superpowers, global instability, and overdue replacement programmes for its major weapon platforms. For this reason the DIPTF's report is a fundamental contributor to this paper, and will be discussed in further detail in Chapter Six.

Current Defence Industrial Strategy

National Shipbuilding Strategy[40]

The Government of Canada stated that the National Shipbuilding Strategy (NSS) is designed to "help the shipbuilding industry avoid the historical boom and bust cycle that has characterized industry activity in the past by creating a long-term, steady work flow…" while building and maintaining "an effective federal fleet for maritime security services while maximizing economic benefits across the country."[41] The NSS therefore forms one of the two narrow cases in Canada where the Government has provided policy coverage for intervention in the Canadian DIB, and has acted under that policy; the other example is the Munitions Supply Programme which will be discussed later in this chapter. This case is therefore evidence of the Government's willingness to intervene in the defence market to achieve its objectives; notwithstanding that the objectives in this case being economic.[42] While Todd Ring, the senior bureaucrat formerly in charge of NSS, challenged the argument that "it would be cheaper and faster to build offshore,"

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[40] Note that NSS was previously referred to as the National Shipbuilding Procurement Strategy (NSPS).
[41] Canada, Innovation, Science and Economic Development Canada, "National Shipbuilding Strategy (NSS)," accessed March 20, 2017, https://www.ic.gc.ca/eic/site/sim-cnmi.nsf/eng/uv00050.html;
[42] Auger, Martin. *The National Shipbuilding Procurement Strategy: A Five-Year Assessment. Publication No. 2015-35-E* (Ottawa, Canada: Library of Parliament, 2015), 13, http://www.lop.parl.gc.ca/content/lop/ResearchPublications/2015-35-e.pdf.

because he argued that "it cannot be either proven or disproven,"[43] he also recognized that NSS "implied acceptance by the Government of a 'premium' for building vessels in Canada."[44] Ring's comment regarding the cost premium is the second point that this example raises that is germane to this paper. When should DND absorb the cost of the premium associated with market intervention, and when should it be reimbursed for that premium? In Chapter 6, this paper argues that it depends on whose requirements engendered the market intervention.

Munitions Supply Program

The second example of direct Government of Canada intervention in the DIB, is the Munitions Supply Program (MSP). This programme "was established in 1978 to foster…a domestic industry… to address…a national security requirement for increased self-sufficiency in the supply of critical high-volume usage ammunition to the DND/CF."[45] It currently consists of four companies who act as preferred suppliers, via Strategic Source Agreements, of domestically manufactured ammunition to DND.[46] Government intervention under the MSP have included such actions as: privatization, preferred supplier status, stabilizing production, plant modernization, technology transfer,

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[43] Todd Ring, "The National Shipbuilding Procurement Strategy: How did we get to where we are now," (Calgary, Canada: Canadian Defence & Foreign Affairs Institute, 2016), 2, http://www.cgai.ca/the_national_shipbuilding_procurement_strategy.
[44] *Ibid*., 10.
[45] Canada, Department of National Defence, *Evaluation of the Munitions Supply Program (MSP)* (Ottawa, Canada: Chief Review Services, 2007), ii, publications.gc.ca/collections/collection_2016/mdn-dnd/D58-164-2007-eng.pdf.
[46] Ugurhan Berkok and Christopher Penney, *The Political Economy of the Munitions Supply Program* (Kingston, Canada: Queen's University, 2014), 12, http://cradpdf.drdc-rddc.gc.ca/PDFS/unc196/p800012_A1b.pdf.

and export development.[47] A 2007 report by DND's Chief of Review Services, an internal auditing organization, questioned the validity of the programme in view of two fundamental arguments. First, it argued that the nature of warfare had fundamentally changed, with Canada's "defence strategy geared to asymmetric threats," and away from the "Cold War strategy" requiring the Sustainment of its military forces. Second, that the Government had moved to a non-interventionist policy for its procurement, placing primacy on such factors as "full, open and transparent competition" and the use of "commercial/military off-the-shelf" materiel.[48] A follow-up study in 2014 conducted by Dr. Ugurhan Berkok and Christopher Penney from the Royal Military College of Canada and Queens University, also questioned the requirement for security of supply that drove the MSP and domestic ammunition production "…in the post-Cold War period, and in particular, under NATO standardization practices that may smooth out member country supply fluctuations…"[49] Later in this chapter, this paper will discuss the Jenkins Report, which interestingly, pointed out the MSP as an example of what the Government should be doing more. This paper posits that any recommendation to dismantle the MSP should await an evidence-based analysis of DND's industrial requirements, the framework for which will be discussed in detail in Chapter Six.

North American Defence Industrial Base

Defense Development and Production Sharing Agreements. As previously noted in this chapter, Canada's decision to stop developing its own major weapons platforms

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[47] Canada, *Evaluation of the MSP, 3.*
[48] *Ibid*., 5.
[49] Berkok and Penney, *Munitions Supply Program, i.*

led it to sign the Defence Development and Production Sharing Agreements (DD/DPSA) with the US in the early 1960s. The production agreement provided Canadian export manufacturers with "…access to the American defence market in return for Canadian procurement of US weapon systems…," and was followed up by the second agreement covering research and development.[50] In 1985, the US and Canada "reaffirmed their commitment to the DD/DPSA agreements and pledged to reduce the legislative and administrative barriers to cross-border defense trade," which resulted in the creation of the North American Technology and Industrial Base Organization (NATIBO). NATIBO's mission statement states, "in support of North American national security, the NATIBO facilitates technology and industrial base efforts between the U.S. and Canadian Defence Departments."[51]

US Purchases. Despite the origins of the DD/DPSA agreements previously discussed, and the advantages which the agreements provide to the Canadian DIB for exporting defence materiel to the US, there is currently no blanket Government policy which permits DND to favour the US as a source of defence materiel and services. Regardless of the absence of an explicit DIS in place favouring US systems at the time of their purchase, the reality is that the US remains Canada's largest supplier base. Most major weapons systems used by the CAF, from the Second World War until the present, are of US origin as, "since the 1960s, Canada has pursued a strategy of purchasing almost all of its major platforms and weapon systems from foreign suppliers (mainly the United

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[50] Johnston, "Canadian Defence Industrial Policy," 25; *Defense Development Sharing Agreement.* November 21, 1963. http://www.ccc.ca/~/media/PDF%20Documents%20-%20Versioned%20-%20English-French/Exporters/DDSA_e.pdf?la=en; *Defence Production Sharing Agreement.*

[51] NATIBO, "North American Technology and Industrial Base Organization," accessed March 21, 2017, http://www.acq.osd.mil/mibp/natibo/index.html.

States) while developing and manufacturing high-quality defense subsystems…"[52] Two of the few examples of major systems produced in Canada during this time are "the Swiss-design Light Armored Vehicle (LAV), and the Canadian Patrol Frigate."[53] Notable exceptions to Canada's foreign procurement that was not from the US occurred during the Government of Pierre Elliot Trudeau who sought "…greater trade and political links with Western Europe…," leading to the purchase of the "German Leopard I tank and an Italian 127mm naval gun for Canada's four *Tribal*-class destroyers."[54] Canada's most recent purchases continue to reflect US primacy as the primary supplier of major defence platforms, albeit frequently through the Canadian arm of US parent companies. These include the sole source contracts awarded to Boeing Canada for the C-17 Globemaster and CH-147F Chinook, and to Lockheed Martin Canada for the C-130J Super Hercules, in support of the war in Afghanistan. It also includes the winning of recent open competitions, including to Sikorsky for the CH-148 Cyclone, and to Textron Canada for the Tactical Armoured Personnel – Vehicle (TAP-V). However, the contract for the Fixed Wing Search and Rescue replacement was won by the European aerospace giant Airbus with its C-295. Finally, significant outcry over the sole-source contract to Lockheed Martin for its expensive F-35 fighter jet replacement led to promises for a future open competition, and an additional sole-source contract for eighteen Boeing Super Hornet jets. In Chapter 6, this paper discusses a framework for analyzing the global risks which may jeopardize foreign supply chains, and drive the need for Assured Sources of supply.

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[52] U.S. Congress, *U.S. Defense Industrial Base*, 105.
[53] *Ibid*., 106.
[54] *Ibid*., 110.

This framework could provide the mechanism by which DND could articulate the its operational requirements for procuring from the US or North American DIB.

Nation Security Exception

National Security Exemptions (NSEs) form a component of trade agreements, such as under the North American Free Trade Agreement (NAFTA) and the World Trade Organization (WTO), which *Defence Administrative Orders and Directives (DAOD) 3016-0* states, "permits a government to exclude a procurement from the application of the procurement rules of the trade agreements if it is necessary for the protection of its security interests."[55] The NSE has recently received national attention due to a Canadian International Trade Tribunal challenge raised by IBM Canada, engendering wider questions on the degree to which the NSE is currently in use, particularly for information technology equipment.[56] This case highlights that rather than being a seldom employed instrument of sovereign power, in reality, the NSE is being used hundreds of times each year.[57] Therefore, from the perspective of this paper, the NSE can be assumed to be both available and acceptable for use to further the defence industrial needs of DND, where they fall within the security interests limit of the NSE. DAOD 3016-1 provides examples of acceptable security interests, including "the sensitive nature of the procurement is such that it has to be restricted to specific suppliers; [or] there is a need to ensure a source of

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[55]Canada, Department of National Defence, *DAOD 3016-0, National Security Exception Under Trade Agreements* (Ottawa, CA: Department of National Defence, 2003), accessed March 20, 2017, http://www.forces.gc.ca/en/about-policies-standards-defence-admin-orders-directives-3000/3016-0.page.
[56] Alison Crawford, "MPs investigate use of national security exceptions in federal procurement," *CBC News*, February 23, 2017, accessed March 12, 2017, http://www.cbc.ca/news/politics/national-security-exceptions-contracts-procurement-1.3996229.
[57] *Ibid*.

supply in Canada for particular goods or services necessary for DND and CAF operational readiness…"[58] In Chapter 6, the proposed framework provides DND a mechanism to work with the multiple stakeholders to decide when to restrict competition to establish Assured and Strategic Sources of supply. The NSE would play a fundamental role in enabling the Government to support DND's DIB to meet the CAF's industrial requirements.

Industrial Regional Benefits Policy

The Industrial Regional Benefits (IRB) policy is a mechanism by which the Government of Canada seeks to leverage defence procurement to "generate high value-added business activity for Canadian industry."[59] The IRB policy is Canada's version of an offset policy, routinely used by states who import defence materiel and services. The IRB policy states that companies must "undertake business activities in Canada valued at 100 percent of the value of the defence or security contract they have been awarded by the Government of Canada."[60] It should be noted that while the IRB policy remains extant, it is being superseded by a new Industrial Technical Benefits (ITB) policy, which will be discussed later in the chapter. From the perspective of this paper, the IRB has a few key shortfalls. First, as Stone notes, "IRB policy should be consistent with, but is not the same as, a defence policy." As Canada lacks a DIS, it is difficult to align the outcomes of the IRB policy with defence requirements, even if there was policy coverage permitting one to do so. For example, "Byers found the early stages of the [IRB policy]

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[58] Canada, *National Security Exception*.
[59] Canada, Innovation, Science and Economic Development Canada, "What is the IRB Policy?" accessed March 21, 2017, https://www.ic.gc.ca/eic/site/042.nsf/eng/h_00016.html.
[60] *Ibid*.

(early 1970s) lacked vision and depth as they made no attempt to link procurement policy with the defence sector."[61] Also, to the casual onlooker, the IRB policy may appear to be Canada's DIS, which may reduce the Government incentive to issue a true DIS. Second, Stone notes that "it is only applied to individual projects one project at a time without reference to past and future projects." The nature of the market-based application of the IRB policy precludes the ability to guide its outcomes to meet defence goals, which "…limits the role that DND can play in the development of IRB packages and any strategic interest in the development of a set of defence industry capabilities occur happenstance rather than intent."[62] In Chapter 6, the proposed framework seeks to achieve coherence between defence policy and Government intervention in the DIB.

Jenkins Report

As previously noted, the *Canada First: Leveraging Defence Procurement through Key Industrial Capabilities* report was delivered to Rona Ambrose, the Minister of Public Works and Government Service in 2013, by Tom Jenkins, her appointed "…Special Adviser regarding the development by the Government of Canada of a Defence Procurement Strategy."[63] The Jenkins Report focussed on the needs of the defence industry, and how industry could leverage defence procurement to better support the Government's economic goals, such as through Key Industrial Capabilities (KICs) and Canadian-only contracts. The Jenkins Report led directly to the launch of a new Defence Procurement Strategy (DPS) and a major update to the IRB policy. The Jenkins Report

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[61] Solomon, "Defence Industrial," 120.
[62] Stone, "Defence Industrial Policy," 345.
[63] Jenkins, *Canada First*, viii.

did not, however, examine whether there were DND needs which could be better enabled by a more KICS-focussed defence industrial strategy. Neither did the Jenkins Report analyze DND's possible needs for Canadian-only contracts, other than to hypothesize about a security of supply need. The inclusion of such a detailed investigation could have shared the benefits of the policy across more stakeholders, and possibly increased the degree to which the overall benefit to the Canadian DIB. It was the absence of such an examination that prompted the writing of this paper, to provide the missing DND perspective, which is discussed in Chapter 5. In this section however, this paper focuses on three key aspects of the Jenkins Report, which are specifically germane to DIS vice DPS. These aspects are: leveraging defence procurement to support the Canadian DIB; leveraging IRBs to achieve Canadian DIB objectives; and defining KICs.

Leveraging defence procurement. In Jenkins' mandate letter, the Government identified the purpose of the DPS as meeting the operational requirements of the CAF "while maximizing related job creation, supporting Canadian manufacturing capabilities and innovation, and bolstering economic growth." To this end, Jenkins was mandated to develop criteria to select KICs, develop a process to apply the criteria, and identify who could conduct the process on behalf of the Government. Jenkins not only answered his mandate, but also made several other recommendations to better inform the DPS. While attention quickly moved on to the Government's actual DPS, one key recommendation was arguably neither implemented nor received much attention. The Jenkins Report had recommended, "for defence procurement in specific KICs areas – preferred sourcing from Canadian suppliers, such as already occurs through the Munitions Supply

Program."[64] In other words, the Jenkins Report called for direct Government intervention in the DIB by providing preferential treatment for suppliers within the Canadian DIB. This is a theme that was repeated throughout the Jenkins Report, including calling for better exploitation of the National Security Exception discussed above,[65] "a clear preference for direct contracts [to Canadian firms], rather than, in effect, the consolation prize of IRBs."[66] It also advocated for "the primacy of demand-pull policies through a defence procurement framework that promotes Canadian supply capability in areas determined to be in Canada's long-term interest," such as the Munitions Supply Programme and the National Shipbuilding Programme,[67] "where Canada has specific requirements that may not be adequately met by foreign contractors in terms of timely or secure supply"[68] especially given that "a demand-pull approach offers greater potential benefits at lower costs to the treasury than traditional supply-push policies and programs."[69] The Jenkins Report also called for recognition that it will "require a change in PWGSC's prevailing interpretation of value for money from a focus on lowest short-term cost to greatest long-term economic benefit to Canada."[70]

Leveraging IRBs. Aside from recommending the use of direct contracts to reduce the dependency on IRBs which "present a heightened risk of non-fulfillment,"[71] the Jenkins Report also noted that IRBs have "…a lack of strategic intent and focus,"[72]

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[64] *Ibid*., xv.
[65] *Ibid*., xix; *Ibid*., 21.
[66] *Ibid*., 15.
[67] *Ibid*., 19.
[68] *Ibid*., 22.
[69] *Ibid*.
[70] *Ibid*., 37.
[71] *Ibid*., 36.
[72] *Ibid*., 19.

where "…the overall approach is still fundamentally passive, leaving primes to decide where to place contracts."[73] While the Jenkins Report did not specifically call for a DIS to address this shortfall, it did suggest that KICs could be used as "a guide to an approach for future IRBs."[74] In other words, government policy could be constructed such that bidders were incentivised to align their IRB proposals with the government-selected KICs areas. For the purposes of this paper, there are advantages accretive to the CAF's operational requirements, for increased strength in the Canadian DIB in pre-selected areas, and therefore the alignment of KICs and IRBs could form part of the solution space to be discussed in Chapter 6.

Defining KICs. The Jenkins Report recommended that the KICs should be selected based on three broad criteria: "the operational requirements perspective", "the [export] market opportunity perspective", and "the innovation perspective." While the Jenkins Report alluded to sovereignty and security requirements as justification for limiting competition to Canadian companies, in general, it appears to have considered the operational requirements perspective in the narrow frame of technical requirements for procurement, while this paper considers the longer term industrial needs within this perspective. Also, while the Jenkins Report created an initial list of KICs, how the list would be modified during a multi-stakeholder consultation process, such as described in Chapter 6 of this paper, was intentionally not determined in the Jenkins Report. For example, the Liberal Government's 2017 Budget provided policy coverage to "increase investment in innovation by business in six key areas—advanced manufacturing, agri-

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[73] *Ibid*., 39.
[74] *Ibid*., 26.

food, clean technology, digital industries, health/bio-sciences and clean resources.[75] The ITB Policy calls for KICS to be established by co-operation amongst several departments, which seems likely, as there is "no clear bureaucratic mandate for a particular department to be the champion of industrial policy."[76] Whether the 2017 Budget does create the basis for a "coherent articulated industrial policy for Canada that public servants and defence officials can use to develop a defence industrial policy,"[77] remains to be seen, but does not exist at this time. However, these new industrial policy objectives alone should necessitate a review of the initial KICS list.

Industrial and Technological Benefits Policy

The most significant improvement of the ITB policy, is the requirement for bidders to include a binding Value Proposition as part of their bid, which counts towards the overall bidder's score during the bid evaluation by the Government. The Value Proposition lays out the bidder's proposal for investment in Canada, using the same 100% offset rule that was in place for the IRB policy. However, the proposal will be assessed against several qualitative criteria, such as: defence sector, Canadian supplier development, research and technology development, and exports.[78] This revised process is expected to improve the quality and fulfillment of offsets proposed, and thus better leverage defence procurement to improve Canada's economic strength. While there are

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[75] Canada, Department of Finance, *Building a Strong Middle Class* (Ottawa, CA: Department of Finance, 2017), 46, http://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf.
[76] Stone, "Defence Industrial Policy," 347.
[77] *Ibid*.
[78] Canada, Industry Canada. *Industrial and Technological Benefits Policy: Value Proposition Guide* (Ottawa, CA: Industry Canada, 2014), 11, https://www.ic.gc.ca/eic/site/086.nsf/vwapj/VPGuideEng.pdf/$file/VPGuideEng.pdf.

several smaller changes encapsulated in the updated policy, one change germane to this paper is the future incorporation of KICS within the policy. The ITB Policy specifically references the recommendations made by the Jenkins Report regarding key industrial capability areas, and states that, "The Value Proposition Guide – and in particular the Defence Sector criterion – may be amended in the future to reflect the results of this collective effort…"[79] Most critically to this paper, the ITB Policy also provides policy coverage for DND to establish its own defence industrial requirements, stating that, "in addition [to the Defence Analytics Institute], the Department of National Defence will develop a list of key industrial capabilities required in Canada for operational and security reasons."[80] Chapter 6 of this paper provides a possible methodology by which DND can develop its own list of defence industrial requirements, although it recommends that it is developed in collaboration with other Government and industry stakeholders for efficiency.

[79] *Ibid*., 6.
[80] *Ibid*.

CHAPTER 4 - AUSTRALIA'S DEFENCE INDUSTRIAL STRATEGY

Introduction

In the previous chapter, the Government of Canada's historical interactions and interventions with its defence industrial base were examined to provide precedents for this paper's call for additional government intervention. Chapter 4 continues this theme by examining how Australia decided to intervene in its defence industrial base. Australia is a country of similar economic and military strength to that of Canada. However, Australia made fundamental decisions regarding its defence industrial base that Canada has not. Australia chose to intervene in its defence industrial base for the long-term sustainment of the Australian Defence Force (ADF), rather than only for economic advantage. In juxtaposition to the Canadian Government's DPS, which seeks to leverage defence procurement to support the economy, "there is a clear indication within the defence policy that the Australian Government" wants to increase the defence industry's ability to support the ADF.[81] Australia also chose to encapsulate its intervention within a formally published defence industrial strategy. By reviewing this strategy, this chapter provides evidence that Government intervention in the defence industrial base is a workable and practical solution to supporting the sustainment of a nation's armed forces.

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[81] Stone, "Australia," 5.

Coherent Policy

In Chapter 3, this paper examined the pieces of defence industrial strategy and policy in Canada that were introduced by the Government for varying and narrow purposes, from the decades old Munitions Supply Program to the recent Industrial and Technological Benefits Policy. In contrast to this Canadian approach, "the strength of the Australian approach to connecting its industrial policy to procurement lies with the coherence and consistency that has been achieved with a variety of policy documents that are designed for separate but interconnected purposes."[82] In 2016, Australia released a new trove of coherent documents, including: the 2016 Defence White Paper, the 2016 Integrated Investment Program, and the 2016 Defence Industry Policy Statement, which were also supported by the 2015 Defence White Paper Expert Panel report, and the 2014 Defence Issues Paper, and complemented related Government policies, such as The National Innovation and Science Agenda.[83] This is also following White Papers since 1994 also being published in 2000, 2009, and 2013. This compares to Canada's last White Paper in 1994. The difference between the two countries' efforts does not end with this somewhat arbitrary comparison. The 2016 Integrated Investment Program which, in

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[82] *Ibid*., 13.

[83] Australia, Department of Defence, *2016 Defence White Paper* (Canberra: Commonwealth of Australia, 2016), http://www.defence.gov.au/WhitePaper/Docs/2016-Defence-White-Paper.pdf; Australia, Department of Defence, *2016 Defence Industrial Policy Statement* (Canberra: Commonwealth of Australia, 2016) http://www.defence.gov.au/WhitePaper/Docs/2016-Defence-Industry-Policy-Statement.pdf; Australia, Department of Defence, *2016 Integrated Investment Program* (Canberra: Commonwealth of Australia, 2016), http://www.defence.gov.au/WhitePaper/Docs/2016-Defence-Integrated-Investment-Program.pdf; Australia, Department of Defence, *Guarding Against Uncertainty: Australian Attitudes to Defence* (Canberra: Commonwealth of Australia, 2015), http://www.defence.gov.au/whitepaper/docs/GuardingUncertainty.pdf; Australia. Department of Defence. *Defence Issues Paper.* Canberra: Commonwealth of Australia, 2014; Australia, Department of Defence, *Defence Issues Paper.* **(**Canberra: Commonwealth of Australia, 2014), http://www.defence.gov.au/WhitePaper/docs/DefenceIssuesPaper2014.pdf; Australia, *2016 Defence Industrial Policy Statement*, 10.

general, provided the ten-year procurement plan for the ADF to meet the requirements of the 2016 White Paper, has not only been fully-costed, but that the costing had also been fully validated by "a panel of private sector specialists…who are globally recognized for the costs analysis and assessment services."[84] The potential impact of this key difference on the national DIBs of Canada versus Australia may turn out to be quite significant.

Closer Relationships

Along with policy renewal, Australia also announced organizational changes to how it delivers defence capability which also rebaselines its relationship with industry. These new organizational constructs included the Centre for Defence Industry Capability (CDIC), which provides industry with a co-leadership role alongside Defence to support "industry development, facilitating innovation, and business competitiveness and exports," including through a new Defence Innovation Portal, that permits small to medium enterprises (SMEs) to present their offerings directly to Defence.[85] The Defence Innovation Portal also serves as part of the Government's "new approach to defence innovation" which aims to help "enterprises [who] have often found it difficult to engage with Defence due to the fragmented nature of innovation programs and complex entry processes."[86] This new approach includes: the Next Generation Technologies Fund, the Defence Innovation Hub, the Defence Innovation Portal, and changed culture and processes.[87]

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[84] Australia, *2016 Integrated Investment Program*, 23.
[85] *Ibid*., 16.
[86] *Ibid*., 29.
[87] *Ibid*., 30.

While the substantial organizational changes noted in the previous paragraph will have a significant effect on Australia's DIB, it is the relationships and mentality that underpin these structural reforms that are at the heart of this paper. This paper therefore does not seek to compare the organization structures between Canada and Australia, but instead will focus on how the Australian mindset towards its DIB may support its recommendations for changes in Canada discussed in Chapters 5 and 6. For example, in Australia, its defence policies mean that industry has greater ability to make long term investment decisions based on "greater certainty about the timing and sequencing of planned approvals."[88] The lack of such timeline certainty undermines Canada's attempts to use initiatives such as the National Shipbuilding Strategy avoid the historic "boom and bust cycles" experienced in the Canadian DIB.[89] For the Australian shipbuilding industry, the policy tenets of timing and sequencing were formalized by a 2015 Government decision to "establish a continuous build of naval surface ships," which allows the industry "to be setup on a sustainable, long-term plan."[90] Such actions by Australia give credence to their view that "close collaboration between Defence and industry is critical to meet the challenges of the future and… will be instrumental in delivering and supporting the future ADF,"[91] and illustrate the usefulness of a closer, committed relationship between government and its DIB. This close relationship also means that overly simplistic procurement rules have no place in Australian defence acquisition. Instead "…Defence will be able to adapt the acquisition process to… give more agility to

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[88] *Ibid*., 10.
[89] Lee Berthiaume, "Gap in federal shipbuilding work could lead to Halifax shipyard layoffs," *The Canadian Press*, February 03, 2017, accessed March 14, 2017, http://www.cbc.ca/news/canada/nova-scotia/irving-shipbuilding-work-gap-ship-contracts-layoffs-1.3965113.
[90] Australia, *2016 Defence Industrial Policy Statement*, 20.
[91] *Ibid*., 5.

work with industry to acquire rapidly evolving technology to take advantage of efficiencies in less complex acquisitions." The policy will also "require procurement officers to take into account a range of issues in considering value for money, including financial and non-financial costs," such as sovereign requirements and maximizing international competitiveness.[92]

Sovereign Industrial Capability Assessment Framework

The 2016 Defence Industry Policy Statement stated that "the existing Priority and Strategic Industry Capability policy will be replaced by a Sovereign Industrial Capability Assessment Framework to improve the identification and management of sovereign industrial capabilities that develop and support our ADF capabilities."[93] As the development of this framework is still ongoing, this paper assumes that for the purposes of discussion, it will remain sufficiently similar to its predecessor, that a review of the former Priority Industry Capabilities (PICs) will still prove valuable from a Canadian context. One of the key strengths of the PICs framework, was that it followed the same philosophy of coherent defence policy that Australia maintains. Thus, when their 2007 statement "identified Priority Industry Capabilities (PICs)," it also identified how they were linked to both the Defence Planning Guide and the Defence Capability Plan for the Australian Defence Force (ADF),[94] previous names for current defence policy documents. In contrast, when the Canadian KICS were initially established by the Jenkins Report, they were neither linked to any DND planning process, such as

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[92] *Ibid*., 21.
[93] *Ibid*., 23.
[94] Stone, "Australia," 5.

Capability Based Planning, nor was any plan suggested to do so. KICS were also established to further Canada's economic and industrial goals as its primary objective. In the case of Australia, PICS were driven by the need to support the ADF's long term defence industrial requirements, where "the final decision on what becomes a PIC ultimately rests with the ADF."[95] This appears to remain true for the new Sovereign Industrial Capabilities, with their selection based on the following six criteria: protection of intent, independence of action, assurance of supply, essential skills retention, interoperability limits and benefits, leveraging competitive advantage. However, there are also limitations that bear consideration for Canada as well, such as the clear acknowledgement that that the number of such capabilities will be "small, properly targeted and managed,"[96] where the domestic unavailability of PICS would "significantly undermine defence self-reliance and ADF operational capability."[97] Australia also published a wider candidate list of industrial capabilities that remain in consideration for selection as PICS, and are labelled as Strategic Industry Capabilities. These actions parallel the recommendations of Canada's DIPTF and will be further discussed in Chapter 6.

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[95] Stone, "Australia," 10.
[96] Australia, *2016 Defence Industrial Policy Statement*, 24.
[97] Stone, "Australia," 8.

CHAPTER 5 - DND'S DEFENCE INDUSTRIAL BASE REQUIREMENTS

Introduction

In the previous chapters, this paper examined government intervention in the defence market throughout Canada's history, as well as the current defence industrial policy in Australia. The purpose of this chapter is to use these examinations to argue for Government of Canada intervention in the defence industrial base in support of DND's industrial needs. This chapter argues that because of supply chain vulnerabilities and the need for long term relationships, DND and industry can only meet the CAF's sustainment requirements with Government intervention. As it has been decades since DND has reviewed its requirements for a substantive defence industrial policy, this chapter therefore relies heavily on Canada's historical record of interactions with its defence industrial base, as well as the modern DIS example of Canada's near-peer ally, Australia. This chapter argues for government intervention in the defence industrial base based on three key factors, which arose from the historical and Australian examination, to support the sustainment of the CAF: preparedness, agility, and effectiveness.

Sustainment of the CAF

In investigating the state of defence industrial policy within DND, this paper found little evidence that the Government acknowledges a requirement for industrial capacity to support the sustainment of the CAF.[98] As noted by the president of CADSI, Christyn Cianfarani Canada's closest allies all have widely-reported government policies

[98] Stone, "Defence Industrial Policy," 344.

aimed directly at their defence industrial bases to address this critical issue.[99] Yet, their actions have failed to generate any public discussion between DND and its stakeholders.[100] Academia has spoken strongly in favour of a defence industrial strategy.[101] Industry has done the same.[102] However, neither of these stakeholders are responsible for the defence of Canada and the success of its expeditionary missions. The last time that DIS was championed was in the final days of the Cold War.[103] The results of DND's high profile efforts were short-lived, with every indication that the Department quickly went back to its decades long practice of ambivalence towards the Canadian DIB.[104] There are reasonable explanations for this behaviour. The budget cuts of the 1990s forewent the capital acquisitions on which to base a DIS, as well as reducing the personnel available to develop and implement such a strategy. CAF leadership would likely have focussed on routing any available funding to support its forces-in-being through direct equipment expenditure, rather than sustainment considerations. Adversaries with strong conventional forces diminished, reducing the need for strong conventional forces while Canada was focussed in the 1990s on peace support operations and in the 2000s on counterinsurgency operations. With the steady return to a multipolar

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[99] CADSI, "At a Crossroads: Canadian Defence Policy and the Canadian Defence Industrial Base" (Ottawa: CADSI, 2016), http://dgpaapp.forces.gc.ca/en/defence-policy-review/docs/cianfarani-submission-vancouver.pdf.
[100] Murray Brewster, "Timid bureaucrats are delaying progress at DND: retired admiral," *The Canadian Press,* April 28, 2016, accessed March 18, 2017, http://globalnews.ca/news/2668276/timid-bureaucrats-are-delaying-progress-at-dnd-retired-admiral/.
[101] Stone, "Defence Industrial Policy," 344.
[102] CADSI, "Canada's Defence Industry: A Vital Partner Supporting Canada's Economic and National Interests," (Ottawa: CADSI, 2009), 6.
[103] A.J.G.D. de Chastelain, "The Need for Sustainment," *Canadian Defence Quarterly* 18, no. 6 (06, 1989), 16.
[104] Stone, "Defence Industrial Policy," 343.

geopolitical environment led by nations with robust conventional forces,[105] the question is when will DND finally reach the tipping point such that it once again acknowledges the necessity of a stable DIB if it is to support the CAF's sustainment? Will the tipping point occur after it is too late, or could it be set-off by the highly-anticipated release of the Liberal Government's Defence Policy Review?[106]

Preparedness

This paper proposes that the first reason for government intervention in the DIB is for preparedness of the CAF to face future conflicts. There has been substantial discussion within the Canadian defence community, reaching a peak with the previous Conservative Government's release of the DPS, about defence procurement. A major portion of the discussion has focussed on perceived failures within defence procurement, while another portion, based on the recommendations of the previously discussed Jenkins Report, focussed on strengthening the Canadian DIB.[107] The discussion regarding the Canadian DIB has concentrated on leveraging defence procurement to bolster Canada's economy through the high-value jobs associated with the DIB. There is, however, a marked difference between discussions regarding procurement, and the concept of sustainment, which is the focus of this paper. Dr. David Haglund, Director of the Queen's Centre for International Relations at the time, , sought to differentiate between the two

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[105] Canada, Parliament, Senate, Standing Senate Committee on Security and National Defence, *Military Underfunded: The Walk Must Match the Talk*. 42nd Parl., 1st sess., 2017, 7, https://sencanada.ca/content/sen/committee/421/SECD/Reports/DEFENCE_DPR_FINAL_e.pdf.
[106] Canada, Department of National Defence, "Defence Policy Review," accessed March 28, 2017, http://dgpaapp.forces.gc.ca/en/defence-policy-review/index.asp.
[107] Alan Williams, *Reinventing Canadian Defence Procurement: A View from the Inside* (Kingston, Canada: Breakout Educational Network, 2006), xvii.

discussions by stating that "discussions about procurement…focus upon the likely benefits and costs of military capital acquisitions, both in terms of economic and political collaboration and discord between friendly (and usually allied) states…."[108] On the hand, Haglund believed that discussions on preparedness considered the DIB to be of much greater importance, as it represented the totality of a nation's military strategic effect, ranging from "war fighting to war prevention."[109]

Not only is there a difference between the concepts of preparation and procurement, but there is also an inherent tension between the two. Dr. John Treddenick, a professor of defence economics at the Royal Military College at the time, noted that "…there is an awkward contradiction between the need for a defence industrial base that can be rapidly mobilized and the reality of a peacetime base that is specialized and conditioned to cyclical production patterns."[110] But if the defence industrial base is not setup and tended by Government during peacetime, it will not be ready when a crisis hits. An illustrative example previously discussed, where Canada sought to find an acceptable balance between the two, was Canada's Cold War decision to purchase foreign major weapon systems at a significant cost savings to domestic development and production, while supporting domestic manufacturers of weapon subsystems.

Treddenick also stated that "…a nation's defence capability, at least in term of materiel, is a function of three variables: its war reserves, its current rate of production,

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[108] David Haglund, Canada's Defence Industrial Base: The Political Economy of Preparedness and Procurement (Kingston, Canada: Ronald P. Frye & Company, 1988), 2.
[109] *Ibid*.
[110] John Treddenick, "The Economic Significance of the Canadian Defence Industrial Base," in *Canada's Defence Industrial Base: The Political Economy of Preparedness and Procurement,* edited by David Haglund (Kingston, Canada: Ronald P. Frye & Company, 1988), 17.

and the surge capacity of its defence industries."[111] Treddenick's comment begets two critical points. First, this paper and its recommendations are not focussed solely on the Canadian DIB, but on DND's. As will be discussed in Chapter 6, DND's capacity to support the CAF can be considered in view of the global DIB, so long as risk and trade-offs are adequately captured within the decision-making process that would underpin planned defence preparedness. In other words, DND is not obligated to establish long term relationships only with Canadian suppliers. DND can seek to direct such relationships with whichever suppliers in the entire DIB it deems appropriate, or in line with its risk analysis. DND could consider the global DIB in terms of a hierarchy based on strength of military relationships as an example. Thus, if Canada is not the appropriate supplier, DND could examine a set order or preference, such as the United States, Five-Eyes (US, UK, Australia, New Zealand), NATO, and then others. The United Kingdom for example places a strong emphasis on sovereign defence capability, but has an industry that is unique in its ability to span the "complete range of defence equipment".[112] Chapter 6 also discusses preparedness using the Australian concept of sovereign industrial capability along with the DIPTF's concept of assured sources of supply.

The second point that Treddenick's paradigm begets, is that there are several combinations of his three variables that could achieve a similar national capacity, including that "some combinations producing the same level of defence capability will be cheaper than others."[113] This option space creates opportunity for negotiation and compromise between multiple stakeholders to achieve competing Government of Canada

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[111] *Ibid*., 20.
[112] Keith Hartley, *The Economics of Defence Policy* (Abingdon, UK: Routledge, 2011), 189.
[113] Treddenick, "Canadian Defence Industrial Base," 20.

policy objectives. Therefore, the solution space for a DIS should be wide enough that defence preparedness requirements could be met concurrently with economic and industrial ones, as the Australian example in Chapter 4 appears to confirm.

Agility

In the previous section, Treddenick defined three variables as the basis for the sustainment of defence capability: current war reserves, current production rate, and surge capacity. However, while this Cold War model may continue to remain true, the nature of each of the variables has likely evolved. In particular, this paper posits that the modern-day requirement for agility forces a rebaselining of how these variables are considered, which the following paragraphs will examine in greater detail.

War Reserves. One manifestation of agility is the technical innovation that it brings to many aspects of defence equipment, and electronics-based equipment in particular. The high rate of technical innovation may decrease the working lifespan of a piece of equipment, before it becomes obsolescent. For the war reserves variable, the rapid obsolescence of defence equipment decreases the operational value of placing parts and equipment in long term storage, which is already a costly proposition.[114] Technological change may also reduce the value of war reserves of raw materials, as it also can impact the elemental components of materiel. For example, electrical power may replace combustion systems, battery stockpiles may replace fuel ones, or the need for one rare earth metal may replace that of another. However, as previously noted, a decrease in the amount of equipment reserves would require a greater current production rate or

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[114] Canada, *Defence Industrial Preparedness,* 1-5.

surge capacity if an equivalent amount of defence capability, as described by Treddenick's equation, is to be maintained.

Current Production Rate. The agility to adjust production as needed would be beneficial to the readiness and sustainment of the CAF. The agility to provide materiel just in time could reduce the amount of war reserves needed which decreases readiness costs as well as the number of spares required to be held in stock for current operations and maintenance. Current production lines could also be adjusted not just in volume, but could also permit improvements in the product that enable the CAF to respond to existing threats more effectively, a key principle of the UK's 2005 DIS.[115] To use the example of Australia's continuous shipbuilding program discussed in Chapter 4, incremental improvement could permit each ship to be improved if the results of testing and operational use are fed back into a continuous design process. This contrasts with the having the design phase end before the first of many ships are manufactured to near identical configurations. Additionally, in both this case and the next surge case, while the discussion focusses on materiel, agility can also be applied to contracted services as well, of which there is a wide breadth associated with sustainment, including transportation, health, and maintenance.

Surge Production Rate. The application of agility to surge production, could also change its paradigm from only increasing volume of goods and services to also including the output of new and innovative products to enable the CAF to respond to evolving threats. Whether one considers it the current production rate, or the surge production rate,

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[115] Hartley, *Defence Policy*, 199.

there is a body of evidence that modern conflicts will require materiel agility by the CAF, along with operational agility. This materiel agility is a function of DND's DIB. In the Afghanistan War, the devastating employment of Improvised Explosives Devices (IEDs) by insurgents, necessitated quick defence industrial solutions. Examples of solutions were: increasing the blast protection of land vehicles, purchasing the RG-31 Nyala Mine-Resistant and Ambush-Protected (MRAP) vehicle from South Africa, and purchasing the Chinook helicopter.[116] In the current conflict stemming from Russian-influence in Ukraine, the need for cybersecurity tools to combat the innovative use of hybrid warfare by belligerents, places a new demand on the DIB, not in quantity but in innovation.[117] A larger, more-involved conflict, combined with the increasing speed of modern technological advancement, will place even more extraordinary demands on the DIB. If it is not able to meet these urgent operational requirements, the CAF may be unable to defend Canada's sovereign interests at home and abroad.

Effectiveness

Hidden Costs of Short Term Supplier Relationships. Currently, the CAF is inhibited in its ability to establish long term relationships with a single industrial supplier of equipment or services to meet a single capability, unlike the UK's Ministry of Defence

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[116] Canada, Office of the Auditor General of Canada, *2009 Fall Report of the Auditor General of Canada*, Chapter 5, http://www.oag-bvg.gc.ca/internet/English/parl_oag_200911_05_e_33206.html; Thomas Harding, "Afghanistan: Cold War Warrior is no match for a Taliban bomb in the ground," *The Telegraph*, March 8, 2012, accessed March 30, 2017, http://www.telegraph.co.uk/news/uknews/defence/9129151/Afghanistan-Cold-War-Warrior-is-no-match-for-a-Taliban-bomb-in-the-ground.html.

[117] Matthew Fisher, "Canada's forces deployed in Latvia to include 'cyber warriors' to counter Russians," *The National Post*, March 9, 2017, accessed March 30, 2017, http://news.nationalpost.com/news/world/matthew-fisher-canadas-forces-deployed-in-latvia-to-include-cyber-warriors-to-counter-russian-attacks.

which relies on its partnerships with industry for success.[118] Instead, each time a given capability needs to be upgraded by replacement, there is significant pressure on DND to compete the requirement in an open competition. One example is the eight hundred million dollar sole-source contract to Raytheon for the Evolved Sea Sparrow Missile, which reportedly required Prime Minister Stephen Harper to overrule Treasury Board's opposition. [119] While there is value in open, fair and transparent competition, the hidden costs this engenders should not be ignored. These hidden costs can be considered in three categories: related costs, operational costs, and duplication costs. First, there are direct and indirect additional financial costs related to transitioning to a new supplier that are rarely considered during an open competition. These include significant financial costs required to make changes in support of the new supplier's product, such as: infrastructure, technical interfaces, training, doctrine, and logistics support. These costs negatively affect both DND's capital acquisition budget as well as its annual operating and maintenance budget. Second, there is the non-financial operational cost related to the reduction of operational capability during the transition phase to the new equipment. In the case of advanced weapon systems, it may take several years of operational test and evaluation before the CAF regains the same proficiency with the new system, as with the previous. Third, open competitions also mean that there are multiple systems which perform the identical functions on different platforms within and across services. In the case of a new or upgraded platform, each prime contractor could choose different

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[118] Hartley, *Defence Policy*, 99.
[119] Michael Den Tandt, "Tories approve $800M sole-source purchase of next-gen Navy missiles, sources say," *The National Post*, October 11, 2014, accessed March 27, 2017, http://news.nationalpost.com/full-comment/michael-den-tandt-tories-approve-800m-sole-source-purchase-of-next-gen-navy-missiles-sources-say.

systems, so long as they meet minimal compatibility standards, and similarly when replacing a single system on a platform. Each class of ship in the RCN, for example, could have a unique navigation radar. Thus, not only are there the related and operational costs previously discussed associated with each different system, but there is also the multiplication of costs associated with multiple systems. For example, the naval training schools and systems must be capable of teaching not just one navigation system to operators and maintainers, but several different types concurrently. The supply system must be capable of concurrently procuring, storing, and shipping multiple and redundant lines of spare parts rather than just one. These are all direct costs to the CAF's limited budget, and just as importantly, to the taxpayer. Yet there is no return value to these hidden costs. These are inefficiencies that use funding and resources that could be directed to procuring and adopting new and innovative technology which would be positively accretive to both the CAF and the strength of the DIB.

Forecasting Requirements with Short Term Supplier Relationships. A consistent criticism of DND, is that it is "gold-plating" its statement of operational requirements which underpin a defence procurement process.[120] The complexity of accurately defining requirements for a platform that is likely to be in service in 2070 entails forecasting what the future security environment will look like over the next decades, including the technological advancements that could be adopted by hostile actors.[121] The complexity is exacerbated by DND being inhibited from establishing long term supplier relationships.

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[120] Murray Brewster, "Retired Canadian general aims blunt message at Liberal government ahead of defence review," *The Canadian Press*, March 31, 2016, accessed April 02, 2017, http://news.nationalpost.com/news/canada/former-canadian-general-aims-blunt-message-at-liberal-government-ahead-of-defence-review.
[121] Hartley, *Defence Policy*, 100.

Instead, the CAF is expected to provide its requirements at the front end of a procurement process that may take a decade to complete, and then provide a platform that will last for decades more. Even with a crystal ball to accurately forecast the future security environment, articulating requirements that will be needed in the coming decades, when the new platform is still early in its service life, creates the perception of DND "gold-plating". There is no funding in an overstretched defence budget for periodic replacement of weapon systems to match the evolving threat, which leads to the necessity of requiring the future specification up front. The funding shortfall is made worse by the high hidden costs associated with short-term supplier relationships discussed previously. Long term supplier relationships could allow for DND and the supplier to agree on a moderate capability in the initial installation, with reasonable confidence of a pipeline of future upgrades that can be co-developed to match the threat forecast on a much shorter, and more accurate timeframe. This approach is more in line with the United Kingdom's 2005 Defence Industrial Strategy which endorses through-life capability management, that is, emphasis on "continued development instead of 'must win' procurements."[122] The Evolved Sea Sparrow Missile discussed previously is an example of this pipeline approach. The pipeline approach reduces the need to overshoot the requirement up front, which could be exponentially more expensive, and while introducing cost, schedule, and technology risks to an already complex procurement. The pipeline approach also reduces the capability gap that often opens and increases during the latter part of a system's lifespan. An ideal long term relationship could see a system evolved over time to retain the necessary operational effectiveness, such that the next platform could continue to use

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[122] *Ibid.,* 199.

the same system and supplier, with all the attendant cost savings that might be accrued by doing so. Even with Prime Minister Stephen Harper's support for the Evolved Sea Sparrow Missile pipeline to continue, it was reported that Treasury Board placed a caveat on its procurement; the system could not be transferred to the new class of naval ships, but that the RCN would have to return to "square-one" with a new competition open to all suppliers.[123] Without consideration of the significant hidden costs of such procurement decisions, funding and resources could be mistakenly diverted from DND and the taxpayer to inefficiencies which return little value.

Innovation and Short Term Supplier Relationships. The advantages of accessing long term supplier pipelines also apply to working with innovative suppliers, such as small and medium enterprises (SMEs) in Canada, to develop new products. While a new entrant may have an interesting product, it may run into several barriers. First, if the CAF issued a statement of requirement for this innovative new product, it could face strong opposition to a requirements statement that only one supplier could meet. Second, if DND was permitted to procure the product, the procurement would only be a short-term transactional relationship between the supplier and DND, in-service support aside. DND could have little ability to evolve the design of the innovative product to better suit the holistic needs of the user, such as improving its ruggedness or interface standards. It would face opposition for not accurately specifying its requirements during the initial procurement, even though no supplier could meet them at the time. Third, if DND liked the product and wanted to purchase more, it could face opposition for not going back to

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[123] Den Tandt, "Navy missiles."

open competition. Finally, if after trying the innovative product and possibly developing it further with the supplier, the CAF decided that it was not what it needed, DND could face claims of financial waste and incompetence. From one perspective, it is possible that these challenges by other stakeholders are fully warranted. However, the outcome of these possible challenges is DND's reluctance and inhibition to access and support innovative suppliers within the Canadian DIB that could better meet its operational requirements.

CHAPTER 6 - FRAMEWORK FOR DIB REQUIREMENTS

Introduction

As discussed in Chapter 3, the revised ITB policy called for DND to provide a list of KICS to ISEDC.[124] This call is similar to the original demand placed on the DIPTF in the mid-1980s. In their comprehensive study, *Defence Industrial Preparedness: A Foundation for Defence,* the DIPTF spent years of investigation and analysis to create an analytical framework for the DIB.[125] The purpose of this section is to outline a possible framework by which DND can generate its needs from the DIB in consultation with stakeholders from other government departments and industry. This paper proposes that the seven-step Defence Industrial Preparedness Planning Process (DIPPP) designed by the Defence Industrial Preparedness Task Force (DIPTF) can be used to extend the Capability Based Planning (CBP) process as a possible framework. As will be discussed in this chapter, the CBP process currently generates DND's highest level requirements, and is well-situated to coherently support the generation of industrial requirements as well.[126]

Defence Industrial Needs

Primacy of Needs. In Chapter 5, this paper argued that that DND has its own sustainment driven requirements from the DIB, separate from Canada's economic and industrial needs. While this paper does not challenge the Jenkins Report's

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[124] Canada, *Industrial and Technological Benefits Policy*, 6.
[125] Canada, *Defence Industrial Preparedness,* 3-6.
[126] Canada, Department of National Defence, *Capability Based Planning Handbook* (Ottawa, CA: Department of National Defence, 2014).

recommendations that industry should leverage defence procurement, it argues that DND's needs should inform where and how this leveraging occurs. For example, this paper posits that KICs should be selected from the assumedly wide pool of potential DND's industrial requirements, which would be generated by coherent and rigorous analysis, such as via the framework discussed in this chapter. This defence-prioritized approach to defence industry intervention was the recommendation of the DIPTF in 1987, and is the same approach that Australia uses today. While this contravenes the recommendations of DIS experts such as Stone, who state that "a defence industrial policy should in theory flow from an overall industrial policy…,"[127] there is nothing preventing the selected DND needs from the DIB to be at least "consistent with the industrial policy" [128] and the needs of the DIB. The framework describes how this multi-stakeholder consensus could be achieved, which should reduce resistance to introducing and adopting a DND-prioritized DIS, or at least another piece of a DIS in Canada.

Cost of Needs. While compromise may be achievable between the multi-stakeholder needs from the DIB, this paper posits that there may also be merit in identifying which stakeholder is requesting the market intervention, such that if there is an associated cost premium, it can be charged appropriately. For example, leveraging defence procurement for Canada's economic benefit may be a sound policy, but thus far, it does not recognize the real cost that it may have on DND's already stretched budget.[129] Even the size of the premium being paid by DND for IRBs is unknown, as "Industry Canada and the government have limited empirical data on what IRBs actually cost in

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[127] Stone, "Defence Industrial Policy," 344.
[128] *Ibid*.
[129] Berkok and Penney, *Munitions Supply Program, v.*

relation to buying off the shelf."[130] While the market intervention may sometimes be positively accretive to Canada's GDP in the longer term, the upfront cost impact to DND needs to be recognized. For example, when the IRB policy was upgraded to the ITB policy under the financially-constrained Conservative Government, procurement budgets were not increased to compensate for cost premiums may be more inclined to add in compensation for their possibly increased costs.[131] Nor are procurement budgets likely to increase under the new Liberal Government who, according to David Perry, the Senior Analyst at the Canadian Global Affairs Institute, "will lower Canada's level of Defence ambition," following its recent move of ten billion procurement dollars into the far future.[132] In some cases, as described in Chapter 5, DND will be the requester for an area of market intervention. For example, DND could request that the Canadian DIB setup a domestic continuous build program of a US fighter aircraft to minimize supply chain vulnerabilities and maintain key technical capabilities. As there would likely be a significant price premium to this request, it would remain on DND to pay for it. Assuming that the procurement budget for the next generation fighter remained the same, DND may calculate that it is more advantageous to have far less aircraft in its "forces-in-being" and greater capacity to build aircraft whenever it needs, including maintaining the technical skills to innovate fighter aircraft as well. It is because of the strategic impact

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[130] Stone, "Defence Industrial Policy," 348.
[131] Stefan Markowsi and Peter Hall, "Mandated defence offsets: can they deliver?" *Defense and Security Analysis 30*, no. 2 (2014), 150.
[132] Canada, *Building a Strong Middle Class*, 194; David Perry, "Bad News for Defence" (Calgary, Canada: Canadian Global Affairs Institute, 2017), 3, https://d3n8a8pro7vhmx.cloudfront.net/cdfai/pages/1555/attachments/original/1490219848/Bad_News_for_Defence-Budget_2017.pdf?1490219848.

and opportunity of such decisions, that a rigorous and coherent analytical framework, as proposed below, is recommended by this paper.

Developing Defence Industrial Base Requirements

In the previous section, this paper described some of the negotiation and compromise that would need to underlie the proposed framework, to achieve necessary policy consensus amongst the multiple stakeholders. This section begins by first describing the currently used CBP process. It then walks through the DIPPP initially published by the DIPTF, that this paper has modified to leverage the existing CBP process.

Leveraging the CBP Process

The CBP process is normally a three-year, three phase, cyclical process that seeks to define the future capabilities required by the CAF to meet the Government of Canada's policy and strategy expectations. The first step in the CBP process is the development of a common Future Security Environment (FSE). The 2014 of the FSE version stated that its purpose "…is to provide a pragmatic assessment out to 2040 of trends significant to security and defence in order to inform Canadian Armed Forces (CAF) Force Development (FD)." [133] The second step is to deduce operational scenarios from the FSE "that cover the full-spectrum of military operations."[134] Using these scenarios, DND subject-matter experts use an intensive operational planning process to establish the

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[133] Canada, Department of National Defence, *The Future Security Environment 2013-2040* (Ottawa, CA: Department of National Defence, 2014), xi, http://publications.gc.ca/collections/collection_2015/mdn-dnd/D4-8-2-2014-eng.pdf.
[134] Canada, *Capability Based Planning*, 1.

capability options that could be employed by the CAF to complete the scenarios, that are then selected from by senior leadership.[135] The CBP process therefore provides a sound foundation for the DIPPP, as the input information necessary to start the DIPP is a list of required CAF capabilities. However, the CBP process could also be an effective vehicle to inform later decision points within the DIPPP. The FSE could be expanded to include an assessment of future risks to the global DIB and their supply chains. For example, a scenario involving future conflict in the South China Sea could inform the risk of commercial electronic components from reaching Canada in a timely manner, which may be needed by the DIB. The FSE could also be used to inform the possible preparedness and agility needs of future scenarios as well, underpinning the sustainment capabilities that may be required. For example, the need for industrial capacity to develop unmanned vehicles or systems to combat cyberattacks.

Step 1: Establishment of the Critical Items List

The first of the seven steps in achieving this list begins with DND establishing a Critical Items List (CIL). This is a list of all the materiel or services required to sustain all critical operational requirements. As critical operational requirements are an outcome of the CBP process, as discussed above, this forms a natural nexus point between the two processes. The output of the CBP already includes a mapping of critical operational requirements and major platforms, and therefore could be leveraged to provide the exhaustive Critical Items List.

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[135] *Ibid.*, 2.

Step 2: Establishment of the Industrial Preparedness Planning Candidates List.

In this step, the Critical Items List are assessed to identify whether the sustainment arrangements currently in place are acceptable as they exist, or whether additional actions are required to increase the availability or security of supply. This step therefore produces a total list of supply areas where the DIB arrangement may be weak, called the Industrial Preparedness Planning Candidate List. This step also lends itself to be informed by the CBP process. As discussed above, the FSE could provide information on the geographical risks associated with the locations of the supplier chain and the vulnerability of associated lines of communication. It can also inform the supplier capacities required to meet peacetime, surge, and wartime requirements.[136]

Step 3: Establishment of the Industrial Preparedness Planning List.

Having established a total list of possible candidates where the DIB arrangement may be weak, this step engages with multiple stakeholders, and the DIB in particular, to establish those candidates which may require special intervention and categorized as an Assured Source or Strategic Source, as opposed to a Marketplace source. Definitions of these terms are provided below. This multi-stakeholder engagement also provides the opportunity for efficiency. Rather than DND establishing a list of its own KICS and providing them to ISEDC as requested by the ITB policy, DND could establish a finalized KICS list in conjunction with ISEDC, industry, and other stakeholders. This

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[136] Peacetime relates to the Supplier's ability to maintain the capacity to meet initial purchases, replenishment of training stock, and replenishment of operational stock due to low-intensity peacetime usage. Surge relates to the Supplier's ability to immediately increase output capacity and sustain it for a short period due to forecasted high-intensity operations. Wartime relates to the Supplier's ability to substantially increase capacity within a short period for a sustained wartime effort.

would also apply to other areas where DND is seeking market intervention, such as establishing Assured and Strategic Sources of supply. Following this initial multi-stakeholder consultation, the reduced list of candidates becomes termed as the Industrial Preparedness Planning List.

Marketplace Definition. The Task Force stated that "most defence items in the inventory are not of such criticality that they cannot be sourced from the general marketplace."[137] Most defence requirements are likely to fall into this category. Marketplace means all elements of the DIB that can meet Canada's defence requirements without requiring special advance arrangements, termed as industrial preparedness measures. These requirements include wide-ranging factors such as timeliness, volume and quality across peacetime and wartime scenarios, as well as technical specifications.

Assured Sources Definition. The Task Force defined an Assured Source as "a source of supply of essential defence materiel, services and/or technical capability for which preplanned arrangements have been made to meet national defence requirements."[138] These sources could include "materiel stockpiles, production facilities, and skilled manpower…"[139] across the DIB and could consist of multiple sources if necessary. The purpose of an Assured Source is to ensure that "an item can be delivered to the end user, in satisfaction of an operational requirement, with the highest degree of confidence in time of peace or war."[140] It is also worth noting that at the time of its report, the Task Force also concluded based on the risk of conventional war in Europe, that

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[137] Canada, *Defence Industrial Preparedness,* 3-4.
[138] Canada, *Defence Industrial Preparedness,* 3-3.
[139] *Ibid*.
[140] *Ibid*.

"Canada's Assured Sourcing plans should focus, primarily but not exclusively, on the Canadian and North American defence industrial bases."[141] The preplanned arrangements referred to in the definition of Assured Sources can also be considered in the context of the procurement options discussed in Chapter 5 to improve the effectiveness and agility needs of preparedness. Thus, rather than only restricting the preplanned arrangements to securing surge capacity in the DIB, one could also consider the establishment of long term relationships with suppliers. These long-term relationships could assist in reducing wasteful hidden costs that could accompany an overemphasis on open competitions. They could also assist in increasing ability and speed of the CAF to collaborate with the DIB to achieve rapid and innovative solutions to operational problems.

Strategic Sources Definition. The Task Force defined a Strategic Source as "a source of essential defence materiel, services, and/or technical capabilities for which domestic Assured supply arrangements are required to meet defence needs under peacetime, surge, and mobilization conditions."[142] It is used only when the capability is "so essential to national security/sovereignty that only a domestic sole source can provide the necessary assurance that risks to supply will be minimal."[143]

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[141] *Ibid.*
[142] *Ibid.*, 3-4.
[143] *Ibid.*

Steps 4 and 5: Consideration, Prioritization, and Costing of Preparedness Measures

In these steps, detailed analyses are conducted on those elements of the DIB which form the supply areas detailed in the Industrial Preparedness Planning List. The analyses provide the remaining information required for a leadership decision. The information required from the analyses include determinations such as: whether an industrial preparedness measures will remedy the supply issue, the cost of the industrial preparedness measure, and the operational impact of relying on a Marketplace solution.

Steps 6 and 7: Final Prioritization and Decisions, and Implementation

Similar to the final stage of the CBP process, the results of the options analyses are presented to senior leadership for a final decision. There is again benefit in achieving multi-stakeholder agreement at the senior leadership level by employment of interdepartmental committees, as are used under the new DPS. Also, similar to CBP, the results of this process are unlikely to directly translate into implementation. Rather, the results would be tasked to sponsor and implementation authorities who would be responsible to establish detailed plans prior to receiving specific Cabinet and Treasury Board approvals. Once these plans are approved, project teams would then be tasked with achieving the agreed industrial capacities with suppliers via a variety of competitive and non-competitive procurement processes.

CHAPTER 7 - CONCLUSION

This paper demonstrated that DND should articulate its long term industrial requirements in support of the sustainment of the CAF's operational capability. To support this conclusion, this paper reviewed key defence industrial definitions, conducted an historical examination of DIS in Canada; examined DIS in Australia, looked at modern CAF defence industrial needs; and provided a possible framework to develop and articulate these industrial needs.

The second chapter of this paper examined terms that are not well-defined within Canadian defence circles, but have been either part of DND's lexicon historically, or remain in use by other nations. For example, the Canadian Government has never released a holistic defence industrial policy or strategy, only pieces of policy and strategy sprinkled throughout Canada's history. The definition of the defence industrial base changes with context and whether one wants to include overseas suppliers, Canadian companies with foreign parent companies, or suppliers of non-defence materiel to the CAF. Sustainment is the final term that this chapter sought to define, in order to separate it from the related but different concept of readiness. By defining these terms explicitly, this chapter sought to remove some ambiguousness from the evidence provided in the rest of this paper.

The third chapter comprised an historical examination of DIS in Canada that revealed that, on several occasions in the past, the Government has been willing to intervene in the DIB to ensure that the CAF's operational requirements were met. While these have often occurred to support major conflicts, including the Boer War, World Wars, Korean War, Cold War, and the war in Afghanistan, the lack of industrial

preparedness has often meant that the CAF could not sustain full operations until well into the conflict. The end of the Cold War introduced a short period of time when DND and Government sought to introduce a holistic solution to defence preparedness. Notably, the DIPTF issued a coherent and rigorous report on defence preparedness that included the DIPPP analytical framework to decide where and what action was required; a framework, which this paper posits, could prove useful today. In recent history, this paper examined the National Shipbuilding Strategy and Munitions Supply Program, which along with the Industrial Regional Benefits/Industrial and Technological Benefits policies are the only areas that the Government has committed to intervening in the defence market. While there may be an unintentional bias for US-manufactured goods based on DND's history of acquisition of major platforms, there is no articulated blanket Government policy permitting DND to favour US suppliers in support of a North American DIB. This paper also reviewed the Jenkins Report, not from its impact on the Defence Procurement Strategy per se, but rather its possible effects on the DIB. This paper argued that the Jenkins Report did not adequately consider DND's defence industrial needs in their policy recommendations, but rather focussed on the needs of defence industry to better leverage defence procurement in support of the Government's economic objectives. This omission was the progenitor for this paper being written, to provide the missing articulation of DND's industrial needs. While the Jenkins Report did not consider DND's needs in the production of its list of KICs, ISEDC has now invited DND to provide such input within the ITB framework. Thus, this chapter provided an examination of previous Government intervention, the missed opportunity for DND to

articulate its current industrial needs, and the invitation from Government for DND to do just that.

The fourth chapter of this paper examined Australia's DIS for evidence that this paper's argument for articulation of DND's industrial needs remained valid in the modern era, and was not simply a relic of the Cold War or periods before that. The Australian example demonstrated the feasibility of creating a coherent and affordable defence industrial strategy and implementing it, at least at the strategic level. It also demonstrated that there remained a need for long term industrial relationships in support of sustainment, not just in terms of industrial preparedness, but also in getting materiel to the ADF in a more agile and effective manner. Finally, Australia demonstrated the possibility of selecting KICs/PICs that are driven by the military's industrial needs, rather than solely for the purposes of supporting industry and the economy.

The fifth chapter of this paper articulated the need for Government intervention in support of DND's industrial requirements. Based on the examination of Canada's historical interventions in the DIB and the examination of Australia's DIS, this paper posited that the three factors of preparedness, agility, and effectiveness were necessary to underpin the sustainment of the CAF. This paper demonstrated that industrial preparedness differs from defence procurement, and relies on longer term industrial relationships than procurement transactions. The examination of which industrial relationships to foster, and more specifically with whom, in light of possible geopolitical instability is also a function of defence preparedness. Agility is one of the two proposed additional factors to sustainment, and alters how DND should view traditional concepts such as war reserves, current production rate, and surge production rate. Not only must

sustainment provide the necessary volume of defence materiel and services, it must also innovate the materiel and services to meet the challenges of rapidly evolving threats on the battlefield and beyond. Effectiveness seeks to remove artificial constructs in the procurement system which significantly reduce the amount of capability DND could purchase and operate within its stretched procurement and operating budgets. Effectiveness is arguably reduced by the high hidden costs of purchasing different supplier systems for the same capability, the hidden costs of being forced to forecast requirements farther into the future than should be necessary, and the cost of not leveraging highly innovative small and medium enterprises.

In Chapter 6 of this paper, a possible analytical framework for developing DND's industrial needs is examined, which was created by merging the extant CBP process and the Cold War-designed, but never used, DIPP process. This paper argues that the framework seeks to output industrial needs that are DND-focussed, but which are developed in conjunction with the multiple stakeholders, such as other government departments and the defence industry. However, where industrial needs are articulated to address the needs of others outside of DND, the marginal costs or premiums of the associated market intervention should be attributed to that stakeholder, and the DND budget adjusted accordingly. By the end of its seven steps, the process could output DND-focussed KICs, assured and strategic sources of supply, and the procurement processes necessary to enable them.

This paper has therefore demonstrated that there is a requirement for DND to articulate its own industrial needs, and the associated needs for Government intervention in the defence market aside from economic ones. The paper has also provided a possible

framework which could enable the development of DND's industrial requirements in consultation with the key stakeholders. While the Jenkins Report was a missed opportunity for DND to align its needs to sustain the CAF's operational effectiveness with those of Government and the defence industry, the call for DND to do so from ISEDC is a golden opportunity that should not be missed.

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