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## Government Shipbuilding: The Chase for the Elusive Economic Benefit

Commander R.A. Forbes

**JCSP 40**

### ***Exercise Solo Flight***

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**Government Shipbuilding: The Chase for the Elusive Economic Benefit**

By: Cdr R.A. Forbes

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## **GOVERNMENT SHIPBUILDING: THE CHASE FOR THE ELUSIVE ECONOMIC BENEFIT**

### **Introduction**

On February 27 of this year, Her Majesty's Canadian Ship (HMCS) PROTECTEUR experienced a major fire in her Main Engine Room causing irreparable damage to the ship.<sup>1</sup> On August 30, 2013, HMCS ALGONQUIN (ALG) collided with HMCS PROTECTEUR (PRO) during a training mission creating significant damage to the superstructure of the Royal Canadian Navy's only West Coast air warfare destroyer.<sup>2</sup> Although the Royal Canadian Navy (RCN) continues to investigate the final plan for both ships, these incidents highlight the operational fragility of the RCN fleet. It is this low-point in naval readiness that makes people inside the navy and some defence experts outside the navy raise the issue of procuring ships off-shore. The operational need is dire and the cost effectiveness in building off-shore makes this argument seem simple. Despite this argument, the Government of Canada (GoC) introduced the National Shipbuilding and Procurement Strategy (NSPS) in 2010 based on a "build in Canada" plan for future government ships.<sup>3</sup> What is it about building ships in Canada that seems to unite politicians behind this cause and delay the introduction of new operational vessels

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<sup>1</sup> J. Cudmore, "HMCS Protecteur Crew Fought Engine Fire For 11 hours," *CBC News Website*, Last modified 26 March 2014. <http://www.cbc.ca/news/politics/hmcs-protecteur-crew-fought-engine-fire-for-11-hours-1.2586636>.

<sup>2</sup> Canadian Press, "Two Canadian Warships Collide During Exercise Manoeuvres en route to Hawaii," *National Post Website*, Last modified 31 August 2013. <http://news.nationalpost.com/2013/08/31/two-canadian-warships-collide-during-exercise-manoevres-en-route-to-hawaii/>

<sup>3</sup> Public Works Government Services Commission, "Government of Canada Announces National Shipbuilding Procurement Strategy," Last modified 3 June 2010. <http://news.gc.ca/web/article-en.do?ctr.sj1D=&mthd=advSrch&ctr mnthndVl=12&nid=537299>.

to the RCN and other government departments? It is the idea that the economic benefits of spending \$36 billion within one's own country can be significant. Passing that amount of government funding over to another country's tax base is difficult for society to accept. In the case of shipbuilding, compared with other government projects, the economic impacts are exceptional and unique due to the size of the workforce required and the size and scope of the supply chain that is required to build a ship. Therefore, the RCN's need to introduce new ships to the fleet in the short term is second priority to the GoC's interest in generating the economic benefits of re-creating a naval shipbuilding capability within the country.

The intent of this paper is to look at the GoC's new NSPS and specifically the potential economic benefits that are possible by building ships in Canada. Naval shipbuilding history in Canada is an important starting point that provides context and background to the formation of the NSPS in 2010. Next, government messaging will be looked at in order to understand government priorities. Finally, the paper presents several ideas to consider when assessing the potential economic benefits of government shipbuilding projects from a national level and regional level.

### **Naval Shipbuilding Background**

As a maritime nation, Canadians can boast of a long history of shipbuilding. Along the coast of Nova Scotia, New Brunswick, British Columbia and around the Great Lakes there are many stories of great shipbuilding families in the 19<sup>th</sup> century. At the turn of the century, this began to change. As technology advancements changed ship traffic from sail to steam powered vessels and from wooden hulls to steel prior to the turn of the

century, many North American shipbuilders failed to keep up with technological advances and could not compete on a global market.<sup>4</sup>

Canadian naval shipbuilding does not truly begin until after World War (WW) II. During the War, Canadian shipbuilders built a sizeable merchant fleet in support of the Allied cause. Canada built nearly 1000 vessels at various shipyards across the country at the peak of the industrial boom.<sup>5</sup> Even during this “heyday” of Canadian shipbuilding, Shephard and Hennessey contend that Canadian shipyards focused on low technology merchant vessels and small naval vessels.<sup>6</sup> Lacking the influence of Government R&D in the naval, and thus the shipbuilding industry, present in the US and Britain, Canadian shipbuilders struggled to develop the skillset required to build advanced warships. The most complex vessel built during the war was the *Tribal* Class destroyer. A project that was started at the outset of the war but not operational before the end of the War.<sup>7</sup>

The GoC established the first quasi-government/industry relationship with the Canadian Maritime Commission (CMC).<sup>8</sup> Tasked with coordinating government shipbuilding, the CMC worked closely with government agencies and industry to manage the fate of the merchant marine as well as the naval fleet. The first naval vessel designed and built under the CMC was the 205 (or *St. Laurent*) Class. The first post war naval shipbuilding project in Canada, the *St. Laurent* Class proved to be a challenging endeavor

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<sup>4</sup> K. Hackemar, *The US navy and the Origins of the Military-Industrial Complex, 1847-1883*. (Annapolis, Maryland: Naval Institute Press, 2001), 138.

<sup>5</sup> M. Shephard and M.A. Hennessey, "Naval Shipbuilding in Canada: An Introductory Review of a Century," in *Naval Gazing: The Canadian Navy Contemplates its Future*, ed. A. Griffiths and E. Lehre, 193 (Halifax, NS: Centre for Foreign Policy Studies, Dalhousie University; 2010).

<sup>6</sup> *Ibid.*, 193.

<sup>7</sup> *Ibid.*, 195.

<sup>8</sup> M.A. Hennessey, "The Rise and Fall of a Canadian Maritime Policy, 1939-1965: A Study of Industry, Navalism and the State," (Post Doctoral Thesis, University of New Brunswick, 1995), 171.

given the rapid scale of demobilization following the end of the war.<sup>9</sup> The CMC, tasked by government to create economic benefits in shipbuilding, established the contracts for the first ships across all major yards in Canada. Recognized as one of the most advanced designs of the day when vessel construction began in 1941, by the time construction completed nearly 6 years later, and well over budget, the Naval Staff considered the vessels obsolete.<sup>10</sup> Despite this weak endorsement by the Naval Staff, Canadian naval ships for the next 15 years retained similar hull lines for design including the *Restigouche*-class and the *Annapolis*-classes, a vessel that operated well into the 1990s.

The Department of Defence Production (DDP) replaced the CMC in 1950 and focused on three core areas of development within the defence industry: aircraft, electronics, and shipbuilding. Dan Middlemiss' research on the economic impacts of defence expenditures since 1945, suggests that the political argument of maintaining some form of equitable regional distribution of shipbuilding projects was as strong in the 1950s as it is today.<sup>11</sup> The first Minister of the DDP, C.D. Howe, outlined the following objectives for his agency "...to provide our forces with the best of modern equipment; to build up our mobilization reserves; to provide facilities capable of all-out production should an emergency develop,... to strengthen the economic fabric of our country."<sup>12</sup> This message articulates a clear position that the GoC's intention to rearm the Canadian Armed Forces (CAF) and improve the economy of the nation was a two-pronged policy.

In the 1960s, the RCN procured only a small number of minor vessels within

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<sup>9</sup> *Ibid.*, 196.

<sup>10</sup> *Ibid.*, 197.

<sup>11</sup> D.W. Middlemiss, "Economic Considerations in the Development of the Canadian Navy Since 1945," presented to the Conference "The Canadian Navy in the Modern World" Canadian Forces Warfare School, Halifax, NS, 1985: 20.

<sup>12</sup> Honourable C.D. Howe, "Address to the 65<sup>th</sup> Annual Meeting of the Vancouver Board of Trade." Speech, 29 January 1952.

Canada as a result shipbuilding industry faced a severe cut-back in work. The GoC at the time faced mounting national social programs and a weakening national economy. This combination led to much restructuring of the defence budget, considered one critical area of discretionary spending by the government.<sup>13</sup> Design of the new DDH-280 Class of vessels began towards the end of the decade, however, government budget reduction resulted in the navy effectively losing one-third of its fleet between 1958 and 1968.<sup>14</sup> This shift in policy affected both future builds and maintenance and repair work normally conducted in a shipyard.

One of the most complex defence programs that the government and Canadian industry conducted was the Canadian Patrol Frigate (CPF) project. This project began in the early 1980s with the design phase followed by the construction of the first vessel in 1987. The CPF project was the first major shipbuilding project undertaken at St. John Shipbuilding Ltd. (SJSL) and the first major navy shipbuilding project undertaken in Canada in nearly 15 years. Significant infrastructure was required to outfit the yard and bring it up to a level capable of building a ship as large and as technologically complex as the CPF. The long-term intent of the project was to create a “center of excellence” for shipbuilding at SJSL. However, once the final ship of the class was completed and provided to the navy, the government policy and support of the long-term plan changed, and SJSL closed its doors.

In reviewing this snapshot of Canadian naval history since WWII one can see four distinct cycles where the government invested heavily in defence and followed by a period of major reductions. It is this cycle in the industry that many refer to as the “boom-

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<sup>13</sup> Middlemiss, “Economic...”, 20.

<sup>14</sup> *Ibid.*, 12.

bust cycle” of the Canadian shipbuilding industry.<sup>15</sup> Another critical point to consider is that throughout all of the projects discussed, no single coordinated government strategy for building all government vessels, particularly the larger naval and Coast Guard vessels, existed. The long-term plan adopted for the CPF project began with good intentions for government and industry partnering, but it did not include other government platforms, and it was based on the notion of selling the CPF concept to other countries.<sup>16</sup>

Given the cyclic nature of the marine industry in Canada, one can make the case that Canada does not need to continuously pump money into a yard for it to either create or re-create itself in order to build high-tech naval ships once every 20 or 30 years. The easier option and arguably the most cost effective one is to buy a vessel off-shore from an Allied nation that is already building the capability. This is a solution offered by Jack Granatstein in a recent op-ed for the Canadian Defence and Foreign Affairs Institute (CDFAI) where he opines that creating a high-tech shipbuilding industry may not be the best value for Canadian taxpayers.<sup>17</sup> The United Kingdom’s (UK) Military Afloat Reach and Sustainability (MARS) vessel is one example of the off-shore procurement solution. Four MARS vessels will be built in South Korea at a cost of CAD\$775 million.<sup>18</sup> Although the vessel will be outfitted in the UK (at cost that is not released to date), the

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<sup>15</sup> Government of Canada, "NSPS Media Technical Briefing," last modified 21 July 2011, <http://www.tpsgc-pwgsc.gc.ca/app-acq/sam-mps/seancens-nebriefg-pres0721-eng.html>.

<sup>16</sup> M. Shephard, M.A. Hennessy, "Naval Shipbuilding in Canada: An Introductory Review of a Century," in *Naval Gazing: The Canadian Navy Contemplates its Future*, ed. A. Griffiths and E. Lehre, 202 (Halifax, NS: Centre for Foreign Policy Studies, Dalhousie University; 2010), 203.

<sup>17</sup> J.L. Granatstein, "Building Ships in Canada?" last modified November 2013, <http://www.cdfai.org/monthlycolumn/november2013column.htm>.

<sup>18</sup> Based on conversion rate of UK pound to CAD on 9 May 2014.



British government believes *best value* to the British taxpayer is to build its tanker fleet in the global market economy vice within the domestic industry.<sup>19</sup>

Throughout all classes of ships discussed above, the procurement of ships always included a build in Canada solution. This theme continues with the current government under its NSPS established to create a long-term plan for building and repairing future government vessels in Canada. An outline of the strategy including political messaging from all parties is important in understanding the support for this current strategy and why the procure off-shore concept is not an option in Canada.

### **NSPS and Government Messaging**

The NSPS includes a whole of government approach to large ship procurement. A core concept is to create a long-term plan to permit the shipbuilding and marine industry to re-invest in infrastructure and skilled personnel. The strategy established two yards to conduct the fleet renewals. Vancouver Shipyards will build the non-combat ship projects and Halifax Shipyards will build the combat ships.<sup>20</sup> These packages are worth \$8 Billion and \$29 billion respectfully.<sup>21</sup> The strategy is also set up to ensure the economic benefit of \$37 billion is maximized within Canada to the greatest extent.

In 2010, when the GoC introduced the NSPS four government Ministers attended the announcement. As Minister of Defence, the Honourable (Hon.) Peter Mackay pointed

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<sup>19</sup> R. Scott, "Daewoo Bid Wins MARS Tanker Prize," Last modified 27 February 2012, *Jane's Defence Weekly*, <https://janes.ihs.com/CustomPages/Janes/DisplayPage.aspx?DocType=News&ItemId=+++1209184&PubAbbrev=JNI>.

<sup>20</sup> Public Works Government Services Commission, "NSPS Media Technical Briefing," Last updated 21 July 2011, <http://www.tpsgc-pwgsc.gc.ca/app-acq/sam-mps/seancens-nebriefg-pres0721-eng.html>.

<sup>21</sup> Office of the Auditor General, "Fall Report of the Auditor General of Canada" Last updated 26 November 2013. <http://www.tpsgc-pwgsc.gc.ca/app-acq/sam-mps/ddi-bkgr-5-eng.html>.

out that this new strategic relationship would assist with the Canada First Defence Strategy (CFDS). Three of the other four Ministers commented on the economic benefits and job creation opportunities that the strategy will provide. The following was the comment by the Hon. Gail Shea, Minister of Fisheries and Oceans, “we are proud to support Canada’s new shipbuilding strategy because it will create jobs and help stimulate our country’s economy,...it will also give Canada’s Coast Guard the tools it needs.”<sup>22</sup>

Following the announcement of HSL and Seaspan Marine as the selected shipbuilders the Prime Minister visited both shipyards on the same day and provided the following comments:

Our Government is committed to supporting the Canadian marine industry, to revitalize Canadian shipyards and to build ships for the Royal Canadian Navy and Canadian Coast Guard here in Canada. The agreement in principle reached today with Vancouver Shipyards Co. Ltd. is a milestone of our Government’s National Shipbuilding Procurement Strategy – a strategy that will mean jobs and economic growth for the country and stability for the industry. The [NSPS] – the largest procurement sourcing arrangement in Canadian history – is expected to create thousands of high-value jobs across the country and will have significant economic benefits in shipbuilding and related industries across Canada.<sup>23</sup>

The message from the Prime Minister and his fellow Cabinet Ministers is one of job creation, economic benefits and procurement of equipment for the RCN and the CCG. Several times since the first announcement of NSPS government ministers repeat the same message in the same order of priorities.

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<sup>22</sup> Public Works Government Services Commission, "Government of Canada Announces National Shipbuilding Procurement Strategy," Last updated 3 June 2010, [http://news.gc.ca/web/article-en.do?ctr.sj1D=&mthd=advSrch&ctr\\_mnthndVI=12&nid=537299](http://news.gc.ca/web/article-en.do?ctr.sj1D=&mthd=advSrch&ctr_mnthndVI=12&nid=537299).

<sup>23</sup> Stephen Harper, Speech "Government Concludes Agreement in Principle with Vancouver Shipyards Co. Ltd to Build Non-Combat Vessels," Vancouver Shipyards Co. Ltd., North Vancouver, BC, 12 January 2011, <http://www.pm.gc.ca/eng/node/21778>.

Normally opposition parties in Parliament focus on critiquing the government's announcements. In the case of NSPS critique was limited. Peter Stoffer, a Member of Parliament from the Official Opposition Party, provided praise for the "fairness and independence of the process" of selecting the NSPS shipyards.<sup>24</sup> Interim Liberal Leader in 2011, Bob Rae, suggested to government in Question Period that other defence procurement projects, such as the selection of fighter jets, follow the same "non-partisan" process.<sup>25</sup> These opposition comments indicate multi-party support for the creation of the NSPS. Although every election brings new policy to government, the current message from opposition parties is that they will maintain a similar course with NSPS.

In the Federal government's 2013 Budget, the GoC provided a clear message to industry and government agencies that the government is committed to building equipment for the CAF in Canada. In 2013, a special advisor to the Minister of PWGSC, Mr. Tom Jenkins, published a report that outlined the economic benefits of investing in a domestic defence industrial base.<sup>26</sup> The 2013 Budget referred directly to this report stating the government "...endorses Mr. Jenkins' proposal to use key industrial capabilities (KIC) as a means of fully leveraging defence procurement projects to support economic opportunities for Canadians."<sup>27</sup> By making use of the federal budget to state their commitments, the government is sending notice to all federal agencies that future CAF procurement projects must leverage the domestic defence industrial base.

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<sup>24</sup> L. Payton, "Halifax, B.C. yards win shipbuilding work," Last modified 19 October 2011 <http://www.cbc.ca/m/touch/news/story/1.1000979>.

<sup>25</sup> J. Taber, "Harper's 'refreshing' approach to shipbuilding contracts gets thumbs up from lobbyist," Last modified 21 October 2011, <http://www.theglobeandmail.com/news/politics/ottawa-notebook/harpers-refreshing-approach-to-shipbuilding-contracts-gets-thumbs-up-from-lobbyist/article618494/>.

<sup>26</sup> Tom Jenkins, *Canada First: Leveraging Defence Procurement Through Key Industrial Capabilities*, February 2013, 39.

<sup>27</sup> Department of Finance, "Jobs Growth and Long Term Prosperity: Economic Action Plan 2013." <http://www.budget.gc.ca/2013/doc/plan/budget2013-eng.pdf>, 107.

Investment in defence procurement is traditionally a subject of great debate in Canada, however the current government is ending much of this debate through the creation of the NSPS. Reports such as the one by Mr. Jenkins and others, speak to the economic benefits of maximizing defence procurement expenditures within your own country. However, when it comes to the fabrication of a major weapon system such as a new tank or new fighter jet, procuring from an existing production line from an allied nation is often an acceptable option.<sup>28</sup> What is it about shipbuilding that makes it particularly sensitive to political interests and the creation of economic benefits? Are the economic benefits around shipbuilding truly as great as politicians and the industry lead us to believe? To understand this it is necessary to look closer at the economic benefits that are generated from naval shipbuilding.

### **Economic Benefits of Shipbuilding**

In order to look at the specific economic benefits of shipbuilding this paper will look at three key pieces of information. First, the paper will review the impact of the CPF program in the 1980s on the province of New Brunswick and Quebec. Next, the report will assess the Canadian Association of Defence and Security Industries (CADSI) report on the economic benefits of building government ships in Canada. Third, the report will look at the economic impact of the United States (US) naval shipbuilding industry on the US economy and compare this against Canada's estimates.

Oxford Economics uses three key channels of economic activity to measure the contribution of an industry to the economy. This is the same method used by Statistics

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<sup>28</sup> Procurement of the CF-18, C-17s, the next generation fighter jets and the Leopard II Tanks are examples of procurement from existing production lines or from surplus stocks of allied countries.

Canada in the preparation of their input-output models used to track economic activity in Canada. The channels of are: direct impacts, indirect impacts, and induced impacts.<sup>29</sup>

*Direct impacts* are the employment and activity from the sector itself. For the purposes of this report, the sector is the shipbuilding and repair sector.<sup>30</sup> *Indirect impacts* are the incomes and employment generated down through the supply chain from the purchasing of goods and services from the sector. Jack Treddenick points out, in his 1984 report on the impact of defence expenditures on the Canadian economy that these indirect impacts spread across many different industries in the economy and not only the direct suppliers of parts for a defence product.<sup>31</sup> In the case of naval shipbuilding this impact can be significant. For an example, the fire-control system for the new CSC vessel could be manufactured and tested in a different province from where the unit will be installed on the ship. In the case of the CPF project, CAE manufactured the Integrated Machinery Control System (IMCS) in Montreal before installing it on ship at SJSL.<sup>32</sup> The *induced impacts* are the re-spending of incomes generated, either from direct employment in the sector or from any employment involved in the supply chain that provides goods or services to the sector. Since this household spending can extend the effect of the industry throughout the economy, Statistics Canada and other national statistics offices use economic multipliers to measure the induced impact of an industry.

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<sup>29</sup> Oxford Economics, "The Economic Case for Investing in the UK Defence Industry," (Geo Economics: Oxford, UK, 2009), 14.

<sup>30</sup> Statistics Canada refer to the shipbuilding industry as the "Shipbuilding and Repair" sector. This input-output code is BS336611. The activities of shipyards include the construction of ships, their repair, conversion and alteration, the production of prefabricated ship sections and barge sections, and specialized services, such as ship scaling, when performed at the shipyard.

<sup>31</sup> J.M. Treddenick, "Regional Impacts of Defence Spending," in: *Guns and butter: Defence and the Canadian Economy* (Toronto, ON: Canadian Institute of Strategic Studies, 1984), 145.

<sup>32</sup> B. Blattman and H.V. Archibald, "CPF construction: Experience gained," 1994, 25.

## Economic Uniqueness of Ships

The sheer complexity of a ship, in particular, a war ship is a major reason why it is unique among defence procurement projects. A modern naval warship is built around a hull that must be capable of floating and operating machinery in a harsh salt-water environment, but at the same time must be capable of offensively engaging an enemy combatant with a weapon system, in the air, on land, or at sea. Modern naval doctrine reminds us that all of this must be done while surviving an attack on itself, meaning damage control considerations must be incorporated.<sup>33</sup> All aspects of the requirement to *float, move, and fight* must be included in the design and build of a navy ship. This means that the construction of naval ships is infinitely more complex than building a civilian merchant vessel in a shipyard, and puts the naval ship project on a larger scale than even an advanced aircraft or tank procurement project.

All modern Navies build vessels based on a 30+ year operation cycle. If you look at the Canadian experience this forecast could be closer to 40 years. Over this planned 30 year period, ships operate on a carefully programmed maintenance plan that includes maintenance overhauls and refit periods. Throughout its life a ship requires upgraded weapon and sensor systems, all which must come from a recognized supplier base.

The initial build of a ship employs very similar skill sets and trades that are required in a heavy maintenance period. During the build in a typical shipyard there are at minimum 12-15 different skilled and unskilled worker trades. Welders, shipfitters, machinists, electricians, pipefitters, riggers, steel/flame cutters (can be heavily automated

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<sup>33</sup> Department of National Defence, *Leadmark: The navy's strategy for 2020*, (Ottawa: DND Canada, 2001), 118.

in a modern yard), crane operators, marine draftsman (no Computer-assisted draftsmen, making their training more technical), shipwrights, lofts people, painters, and joiners are all trades unique to a shipyard environment.<sup>34</sup> Beyond this there are other skilled workers taking part in the test and trialing of equipment and in the planning and integration of the systems onboard the ship. In an advanced warship the training level of the highly skilled technician in charge of the integration of the fire control radar in many cases exceeds the level of a university educated engineer. This technician is more often replacing the skilled tradesperson in the shipyard and is an example of the highly skilled workforce that is generated and required in a naval shipyard.<sup>35</sup> Although the steel cutting and welding associated with a new ship is significant, the reality of a modern vessel<sup>36</sup> is that the hull and structural phase of construction is becoming a smaller portion of the overall budget of the vessel. An example of the high level of technology on a warship is taken from testimony that the French Navy provided to the French government's lower house of assembly in reference to the Combat Management System (CMS) on the new French frigates. The French Navy stated that the CMS in the frigate included over 25 million lines of computer code in order to complete the systems integration. This is comparable to the amount of software code on the United States' *Zumwalt* Class of ships, and nearly three times as much code used during the development on the Joint Strike Fighter 3<sup>rd</sup> generation fighter aircraft.<sup>37</sup>

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<sup>34</sup> C.H. Whitehurst, *The US Shipbuilding Industry*, (Annapolis, Maryland: Naval Institute Press, 1986), 98.

<sup>35</sup> Tom Jenkins, *Canada First: Leveraging Defence Procurement Through Key Industrial Capabilities*, February 2013, 39.

<sup>36</sup> This point refers to both Naval ships and civilian vessels, however the focus of this report is the naval vessel. As such the references point to naval examples.

<sup>37</sup> Defense Industry Daily, "Rapid Fire Dec. 17, 2013: Projected Defense Purchases," Last modified 17 December 2013 <http://www.defenseindustrydaily.com/dod-purchases-state-industry-2012-07640/>.

Beyond the workforce aspect of naval shipbuilding the other factor that separates the sector from the rest of the defence procurement industry is the massive scope of supply chain that is required to build a ship and complete acceptance trials. In order to meet the requirements of *float, move, and fight*, a wide range of equipment must be procured and accurately installed on the vessel. Communications systems, missile systems, navigation systems, Combat management integration equipment, propulsion and power generation equipment, not to mention the actual steel and welding material to assemble the hull; it is all essential to a successful build. For a program that will provide consecutive hulls to outfit such as the AOPS and CSC projects the various industries that are represented in the supply chain and within the yard are identified in various different industry codes in the North American Industry Classification System (NAICS). If one assesses only the NAICS sector code for Ship and Boat Building several industries could be missing.<sup>38</sup> When reviewing the Stats Canada description of the Ship and Boat Building NAICS code exclusions of the code are clearly listed.<sup>39</sup> Several trades that conduct extensive work in the build of an advanced naval vessel are not included in this code. Therefore several codes must be used to calculate the proper economic benefit from the industry. It is this economic complexity that makes naval shipbuilding so unique and difficult to predict the full impact of naval shipbuilding.

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<sup>38</sup> Statistics Canada, “North American Industry Classification System (NAICS) Canada” Last modified 21 November 2011. <http://www.statcan.gc.ca/subjects-sujets/standard-norme/naics-scian/2012/index-indexe-eng.htm>

<sup>39</sup> NAICS exclusions on NAICS code 336611 Shipbuilding and Repairing, exclusions are: ship painting, joinery, carpentry work, and electrical wiring installation, manufacturing prefabricated metal ship, boat and barge sections.



Based on this discussion of the exceptionalism of naval shipbuilding it is now appropriate to look at the economic impacts by first looking at the impact on the national and regional economies of the CPF project conducted in the 1980's and 1990's.

#### CPF Project Economic Impact Comparison

As previously discussed, SJSL won the CPF contract to conduct the detailed design then build of the ships in July 1983. The RCN accepted and commissioned the last of the 12 CPFs in 1996. From 1982 until 1997, the Centre for Studies in Defence Resources Management at the Royal Military College of Canada (RMCC) conducted an annual report on the economic impact of defence expenditures on the domestic economy. By comparing reports produced pre-1982 with reports generated during the CPF project (FY 85-86); an assessment of the economic impact of the CPF project is possible.

Review of the 1982 report indicates the shipbuilding and repair industry experienced minimal impact due to defence spending. Instead the Aircraft and Parts sector is most dependent on defence spending at 14.9% of the overall employment in the industry. This reliance could be attributed to the procurement of the CF-18 and Aurora platforms into the Royal Canadian Air Force (RCAF). In comparison the impact of defence spending in the Shipbuilding and Repair sector was only 4.4% of total employment in the sector.<sup>40</sup>

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<sup>40</sup> J.M. Treddenick, "The Economic Impact of Canadian Defence Expenditures," (Kingston, ON: Center for Studies in Defence Resources Management, The Royal Military College of Canada, 1983), 127.

**Table 1 - Direct, Indirect and Induced Impact of Defence Spending (Closed) 1982 vs 1985 values (\$millions):**

Year	1980-81	1985-56
<b>Total Defense Output</b>	7,546	24,279
<b>Gross Domestic Product at Cost</b>	5,928	11,272
<b>Employment (pers/yrs indirect and induced)</b>	262,081	298,447

Source: Treddenick, "The Economic Impact of Canadian Defence Expenditures 1982." Galigan, "The Economic Impact of Canadian Defence Expenditures Update 1985/86."

Table 1 identifies a significant increase in defense expenditure between the two fiscal years compared. Looking at a breakdown by industry sector allows the reader to see the impact in shipbuilding over this period.

**Table 2 - Indirect and Induced Industrial Impact 1981 vs 1985**

Year	Total Output		Employment	
	1980-81 (\$000)	1985-86 (\$000)	1980-81 (pers/yrs)	1985-86 (pers/yrs)
<b>All industries</b>	2,409,320	7,180,054	120,458	182,105
<b>Aircraft and Parts</b>	102,313	219,529	4,450	4,265
<b>Shipbuilding and Repair</b>	15,531	212,029	515	5,055

Source: Treddenick, "The Economic Impact of Canadian Defence Expenditures 1982"; Galigan, "The Economic Impact of Canadian Defence Expenditures Update 1985/86"

Table 2 highlights the significant jump in expenditures in the shipbuilding and repair sector. This accounts for the start of the CPF project that began in 1983. The increase in

spending from 1980 to 1985 did impact the Aircraft and Parts sector of the economy, however not as drastically as the increase in the Shipbuilding and Repair sector which experienced an increase in employment numbers of just over 10 times previous numbers.

The impact of the CPF project in the regional area where the main construction occurred is another consideration to review. The CPF project was built primarily in St. John, New Brunswick with 1/3rd of the vessels constructed in Quebec. Table 3 provides a comparison of defence expenditures between fiscal years (FY) 1980 and 1985.

**Table 3 – Regional impact of Defence Expenditures 1981 vs 1986**

Province	Domestic Defence Exp. (\$000)		Share of Defence Exp (%)		Provincial share of GDP (%)		Defence Share of Prov GDP (%)	
	80-81	85-86	80-81	85-86	80-81	85-86	80-81	85-86
Nova Scotia	445,598	765,279	12.1	10.8	2.3	2.5	8.2	7.3
New Brunswick	146,089	411,871	4.0	5.8	1.9	1.9	3.3	5.2
Quebec	618,643	1,155,449	16.8	16.3	22.9	22.6	1.1	1.3
Ontario	1,531,676	3,254,296	41.6	45.8	37.0	37.8	1.8	2.0

Source: Treddenick, “The Economic Impact of Canadian Defence Expenditures 1982”; Galigan, “The Economic Impact of Canadian Defence Expenditures Update 1985/86”

Table 3 identifies a noticeable economic impact in the province in New Brunswick comparing FY 1980-81, and FY 1985-86. Across this period, defence expenditures in the province increased by nearly 2.0%. This compared with other provinces during the same period which remained relatively flat or dropped. The impact on the provincial economy can be seen in the last column which identifies that defence impact on the regional GDP increased by 2%. Once again this points to significant

economic benefits being experienced in the regional location of the CPF program. In Quebec, due to the larger provincial economy, there was no distinguishable increase in the regional economy despite building three CPFs in Quebec.

#### Reports on Economic Impacts of Naval Shipbuilding

In 2011 the Conference Board of Canada issued a report in 2011 to look at the economic impacts of NSPS on the city of Halifax. The report makes use of the Stats Canada CANSIM table to estimate of the number of potential jobs. This report estimates that on average once the CSC project is underway the project will be generate 8,500 jobs around the region.<sup>41</sup> Unfortunately there are major concerns with this number, as there are no significant details as to how this number was generated. Even by using the CANSIM tables (CANSIM uses the NAICS Codes), one must be an expert in the varied workforce and industry sectors represented in a shipyard and within the supply chain in order to accurately measure the full economic spin-offs. The figures available in this report appear to focus on jobs only, making it very appealing to politicians.

The Canadian Association of Defence and Security Institute (CADSI) also predicts a large amount of economic benefits with NSPS. In their report titled “Sovereignty, Security, and Prosperity” they estimate that NSPS could provide an annual economic impact of \$2.4B and roughly 15,000 jobs.<sup>42</sup> It is important to note that this report was conducted prior to the announcement of NSPS and did not recognize that two shipyards would build the ships. The selection of two shipyards could impact on the

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<sup>41</sup> Greater Halifax Partnership, “Shipbuilding in Halifax: A Pillar of Nova Scotia’s Economic Transformation,” *Prepared by Conference Board of Canada*, May 2011.

<sup>42</sup> Canadian Association of Defence and Security Industries, “Sovereignty, Security, and Prosperity” *The report of the CADSI marine industries working group*, May 2009, 30.

numbers of the CADSI report. Due to the long distance of the two yards, supplier bases will be different and which may result in some overlap. Based on this new government/industry partnership, the CADSI results may underrepresent the actual numbers of jobs created in the industry when both shipyards are running at full capacity.

Another problem with the CADSI numbers is that they are based on a British Columbia (BC) provincial government report on the economic contributions of the Oceans sector in the BC. CADSI creates an equivalency value based on money expended in the “Ship and Boat building” and “ocean technologies” industry sectors.<sup>43</sup> Once again using this model will not pick up the significant number of different Stats Canada industrial sectors that will be involved in the naval shipbuilding projects under NSPS. Additionally, this report uses an Industry Canada Industrial Regional Benefits (IRB) induced multiplier of 1.5:1 generated by Industry Canada and not Stats Canada. IRBs will have a significant impact on the economy, but the Stats Canada Input-output multiplier tables remain the standard for calculating economic multipliers in Canada.

In general the effects mentioned above on the CADSI estimate number will not lower their original estimate. Therefore it can be considered a conservative estimate on the economic benefits of NSPS. Of note, this is the number that recent government announcements related to NSPS is using as their estimates on the potential numbers for job creation under this policy.

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<sup>43</sup> *Ibid.*, 30.

## Economic Multipliers of the Shipbuilding

Stats Canada identifies the “Total Multiplier” as (direct + indirect + induced effects)/\$1 of exogenous demand on the industry. Based on NAICs input-output models, Stats Can produces multipliers to estimate the full economic impact of an industry. An additional report reviewed looks at economic multipliers generated by the US naval shipbuilding industry. The report looks at the direct, indirect and induced economic impacts of the US government injecting \$1 billion of additional funding into the US Shipbuilding and Conversion, Navy (SCN) budget.<sup>44</sup> In this report the author calculates that total output from the industry is about 3.35:1.

The multipliers calculated are based on a federal income tax rate that includes Social security, and medicare and state taxes as part of a consumption rate that will be different in the Canadian economy. In Canada one can use the Stats Can multiplier values available to see Canadian economy multipliers similar to the rates generated from the Naval Post Graduate Academy report.<sup>45</sup> The Stats Canada total multipliers for the “Ship and Boat Building” sector are 2.08:1 for the total GDP output of the industry and for employment (jobs) 12.27:1. For comparison purposes the “Aerospace and Parts” sector provides multipliers for GDP output of 1.74:1 and for employment 7.14:1. This difference points to the greater number of jobs that could be created in the shipbuilding industry in comparison to the numbers created in the aerospace industry. Once again justifying the Canadian government’s interest in building ships in Canada to create jobs and build the economy.

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<sup>44</sup> The SCN is the US appropriations to DoD to fund USN naval shipbuilding projects.

<sup>45</sup> Stats Can Input-Output National Multipliers, 2010.

## Discussion

In his essay outlining the economic perspective of the Canadian defence industry, Binyam Solomon makes the comment that the defence industry in Canada only represents roughly 0.5% of the national employment levels, making the impact insignificant.<sup>46</sup> If you bring the discussion down to the microeconomics level and look solely at shipbuilding the impacts at the regional level demonstrates the impacts can be significant. This is why most politicians are openly supportive of the NSPS program. In a study conducted in 2012 by the Royal United Services Institute (RUSI) the conclusion suggests that procuring equipment overseas can result only in a loss of taxpayer dollars. Procuring within your own nation can redistribute up to 36% of the defence funds back into your own economy.<sup>47</sup> The procurement off-shore alternative, although possibly faster, can only generate funds for another government; an option that is never palatable over the long-run for domestic politicians.

Determining a complete economic impact assessment for naval shipbuilding is challenging. Earlier it was pointed out the various different skills that are employed during the build cycle of a ship. Additionally, the wide and disparate scope of value chain creates further complications when reviewing the Stats Canada input-output chains. For comparison purposes one can look at the number of different NAICS industry sectors for the motor vehicle industry within Canada. The NAIC codes identify 8 different and unique sectors that support an aspect of the motor vehicle industry. It is important to note that the volume of cars that are manufactured in Canada on an annual basis is significantly greater than the number of ships that will be built under the NSPS.

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<sup>46</sup> Binyam Solomon, "An Economics Perspective on a Defence Industrial Base,"

<sup>47</sup> RUSI, "The Destinations of Defence Pound. 2012.

However, in order to properly calculate the industry sector one must take the time to assess the impact on all different industry sectors that are involved in naval shipbuilding. Using the model for automotive industry could be a starting point for a more detailed analysis of the shipbuilding industry.

## **Summary**

This paper reviewed Canadian shipbuilding since WWII and looked at many of the economic impacts of building ships in Canada. The conclusion of this paper is that there is more work required in this area of research. Due to the varied extent of the workforce required to build a modern warship, the current NAIC sectors may not be adequate to properly look at the complete impacts to an economy of injecting \$38 billion into the industry over 20 years. Although various reports have attempted to do this, closer analysis must be done in aggregating the different NAIC sectors that will be directly impacted within the supply chain. Additionally, creating a supportive and reactive supply chain across the country could prove to be filled with delays while the Canadian economy builds to meet this demand.

What is clear based on various reports already published is that the economic benefits will be significant. It is also apparent that politicians of all political parties are supportive of the idea that the future RCN and CCG fleets will be built in Canada. Over the past 70 years Canada has demonstrated its ability to build high tech, high quality ships for the RCN. Moving ahead the RCN must be willing to work closer with industry than ever before in order to repeat history and ensure that political commitment continues to support the National shipbuilding program into the future. The RCN leadership must



recognize this and work with other government departments to manage the operational gaps of the existing fleet until the new and rejuvenated shipbuilding industry is ready to build and deliver the future fleet.

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