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THE POLITICS AND ECONOMICS OF SHIPBUILDING IN CANADA: LESSONS FOR NAVAL PLANNING?

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ABSTRACT

A broad examination of naval shipbuilding from World War II to the present reveals the extent that the Canadian government has been interested and engaged in the process. Commencing with federal government involvement in post-World War II building programs, this paper demonstrates the complexities of balancing ship procurement with governmental, industrial, and naval demands. Typical of modern defence expenditures, naval construction projects are, absent of any direct threats to Canadian sovereignty, completely discretionary. Hence, new ships must not only be able to address present and future challenges to Canada's maritime security, but the building of them must also contribute to Canada's broader economic and technological development. For the Canadian government, vessel construction also provides a useful way to appeal to the electorate and to stimulate regional economies. An extremely competitive world market with an overabundance of hulls has contributed to the current reduced capacity of Canadian shipyards, disputing the common perception that by not providing continuous government work, Ottawa is solely to blame for the state of the industry. The historical record and recent federal announcements indicate that the government will build ships for the federal fleets, in Canada, when it is economically feasible and politically imperative to do so. Analysis of three potential fleet mix options for the Canadian Navy in the 21st century addresses both this domestic building imperative, as well as the need to proceed expeditiously with the next programme. Based on these considerations, Canada's maritime force may have to trade its aspirations for an advanced and expensive blue water navy in return for a more affordable and less politically vulnerable fleet to meet maritime defence requirements in the 21st century.

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INTRODUCTION

> Shipbuilding is an important industry for Canada. It plays a vital role in building and maintaining the fleets that provide our maritime security.[1]

In late 2008, International Trade Minister Stockwell Day used these words to provide a $380 million federal loan guarantee to the struggling Davie Shipyard in Lévis, Quebec. While this federal financial assistance provided considerable relief to the shipyard's 1,100 employees in the days leading up to Christmas, Day was also delivering a key strategic message, namely that the Canadian government recognized the economic, industrial and electoral value of Canada's relatively small domestic shipbuilding capability.[2] Aside from the government's underlying strategic motives in a region of the country where every Conservative vote counts, the announcement was also significant for the shipbuilding industry, the Department of National Defence (DND) and the Canadian Navy. This is because Davie, a long established Canadian shipyard, boasts one of the few graving docks capable of building vessels the size of the Joint Support Ship (JSS).[3] That this federal assistance was extended as an economic downturn settled in worldwide, suggests that Prime Minister Stephen Harper's Conservative government is interested in shipbuilding as a means toward eventual economic recovery by preservation of employment and skilled jobs.

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[1]Mark Cardwell, "Lifeline Keeps Davie Shipyard Alfloat," *The Gazette*, 18 December 2008. http://proquest.com; Internet; accessed 11 January 2009.

[2]Davie Yards Incorporated, "Temporary layoffs at Davie Yards," available from http://www.davie.ca/eng/default.aspx?ID=company_467374; Internet; accessed 30 March 2009.

[3]The JSS project was the subject of much attention in Fall 2008 after it failed the project definition phase. This problem, and the potential roles of JSS in the next naval fleet are examined in subsequent chapters.

For the Canadian Navy, the Department of Fisheries and Oceans, and the Royal Canadian Mounted Police (RCMP), recent shipbuilding announcements reinforce the Conservative government's intentions to recapitalize aging federal fleets.[4] Indeed much fanfare and optimism followed Prime Minister's visits to Halifax and Esquimalt in July 2007, when he announced government intentions to build six to eight Arctic Offshore Patrol Ships (AOPS), conduct an extensive mid-life update on the Canadian Patrol Frigate (CPF), and carry on with procurement plans to design and build the JSS in Canada.[5] These projects anticipated the government's Spring 2008 release of the *Canada First Defence Strategy* (CFDS), which declared the government's commitment to re-equip the Canadian Forces (CF) over the next two decades.[6] Inclusion of the Navy's preferred, long-term surface combatant replacement in CFDS suggested that the government, in some measure, was willing to accept CF shipbuilding and fleet composition recommendations. Adding to this optimism is the fact that current Defence Minister, Peter MacKay, represents a large shipbuilding constituency in Nova Scotia. However, shipbuilding in Canada has rarely conformed to the hopes of shipbuilders or to the aspirations of naval strategists.

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[4]The Canadian Coast Guard (CCG) currently comes under Fisheries and Oceans Canada. The CCG delivers marine services to the department and operates 114 vessels of all sizes. Notable is the fact that half its fleet is over 25 years old. See Fisheries and Oceans Canada, "Canadian Coast Guard: Our Fleet," http://www.ccg-gcc.gc.ca/eng/CCG/Our_Fleet; Internet; accessed 1 April 2009.

[5]The Halifax Class Modernization (HCM) was already an ongoing federal project. While the Prime Minister used the opportunity to (re) announce plans for the shipyard refit phase, it served to reinforce the government's commitment to the program and the industry.

[6]Canada. Department of National Defence. *Canada First Defence Strategy*, (Ottawa: Information Distribution Centre Communications Branch, 2008), available from http://www.forces.gc.ca/site/focus/firstpremier/June18_0910_CFDS_english_low-res.pdf; Internet; accessed 18 December 2008.

According to Professor Michael Hennessy, "any major recapitalization of the navy will face scrutiny, stir political debate and again challenge the competence of the Canadian state to manage such a great national technological enterprise."[7] Many competing priorities and interests inform the process. For example, despite recent federal shipbuilding announcements signaling the government's intentions to build in Canada, some in the academic and political communities suggest that market forces should be allowed to run their natural course. The argument runs that since Canadian shipbuilders will never be competitive globally, the domestic industry should focus on the niche repair and maintenance sector and cease attempts to build warships, government vessels or large commercial ships in Canada. Proponents of this Darwinian shipbuilding paradigm suggest that Canada could stretch finite ship procurement budgets further by buying offshore.[8] Other people point to the recent off-the-shelf purchases of commercial pattern ships by allied countries - which have then been refitted for naval use - as an inexpensive way to revitalize their federal fleets.[9] Aside from the gross economic merit of these recommendations, the strategic impact associated with a loss of a domestic naval shipbuilding capability would mean that Canada was reliant solely on foreign powers to meet its warship and federal fleet requirements.

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[7]Michael A. Hennessey, "Canadian Shipbuilding: Some Lessons Observed, if Not Learned," *Canadian Naval Review* Vol. 4 No.3, (Fall 2008): 24.

[8]Lieutenant-Commander D Sing, "Procuring Warships For the Canadian Navy: Does Canada Spend Its Money Wisely? (Toronto: Canadian Forces Command and Staff Course New Horizons Paper, 1995), 22.

[9]Doug Thomas, "Warship Developments: To Buy or Lease?," *Canadian Naval Review* Vol. 4 No 2, (Summer 2008): 39.

The shipbuilding sector, according to Janet Thorsteinson, rests upon economically healthy and capable shipyards as "an essential element of Canadian sovereignty."[10] Until recently, with a defence friendly government apparently recognizing the strategic importance of shipbuilding, the JSS project seemingly on schedule and political acceptance of the Navy's future fleet ambitions, the future of naval ship procurement looked promising. It is recognized that a number of challenges in balancing competing operational, project and manning requirements with a finite number of personnel remain. However, despite DND's (and the public's) more recent focus on land-based operations in Afghanistan, the Navy appeared to be well positioned to meet its future fleet aspirations. After a slowdown lasting almost 15 years, the Canadian shipbuilding industry looked forward to the building of billions of dollars worth of impending naval and government contracts.

Defence commentators and naval circles even suggested that the historically cyclical nature of Canadian shipbuilding, difficult for the industry, could be replaced by a long-term building strategy.[11] Recent events have however tempered this optimism. First came the announcement in August 2008 that JSS had failed the contract definition phase after the two competing proposals were determined to be non-compliant because cost estimates came in significantly higher than the $2.1 billion allocated for building the ships.[12] Second came the unforecast economic recession, sparked by the sub-prime

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[10]Janet Thorsteinson, "A Managed Approach to Fleet Acquisition," *Canadian Naval Review* Vol 4, No 2, (Summer 2008): 29.

[11]Janet Thorsteinson, "A Second Sector, Marine Defence Industries, *Canadian Naval Review* Vol 4 No. 4, (Winter 2009): 30.

[12]Sharon Hobson, "Plain Talk: Should the Support Ship Sink?" *Canadian Naval Review* Vol. 4, No. 3, (Fall 2008): 37.

mortgage fiasco in the United States, which has since spread through much of the world. For JSS, the failed project definition may in fact turn out to be a bump in the procurement road while its capabilities are revisited. For the *Canada First Defence Strategy*, the economy and the return to deficit spending has yet to cause the government to deviate from the path of promised ship procurement. However, the full ramifications of the economic downturn on both the pace and the scope of DND's fleet replacement and shipbuilding aspirations are still to be determined.

Yet, with calls for federal spending initiatives to help contribute to renewed economic growth, it is possible that the government may look to shipbuilding as one way to assist in creating jobs and stimulating regional economies. While naval building programs are much longer term federal projects and are not "shovel ready" in the same sense as other spending initiatives, the magnitude of shipbuilding projects, especially those for the Navy, can have a significant political and financial impact for the regions involved. Accordingly, the government has used shipbuilding as a regional development tool in the past.[13] As a consequence, the process has usually been politically sensitive whereby shipbuilders, federal politicians, regional governments and the broader defence industry all covet high value government contracts.

The federal government assumes an integral role in this process as the final arbiter and bank roller.[14] Given the competing interests, history suggests that compromise, delay and affordability have been the order of the day, as defence requirements and

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[13]S. Mathwin Davis, "Naval Procurement, 1950 to 1965," in *Canada's Defence Industrial Base*, ed. David G. Haglund, 97-117 (Kingston: Frye and Company, 1988), 113.

[14]Michael A. Hennessey, "The Rise and Fall of a Canadian Maritime Policy: A Study of Industry Navalism and the State," (PhD Thesis, University of New Brunswick, 1995), 6.

capabilities are balanced with political and economic demands. The next shipbuilding projects in Canada may see little difference from the past. Given the current economic downturn and a pro-defence minority government, seeking to bolster a small political base in Quebec and Atlantic Canada, it is entirely possible that the Conservatives see shipbuilding as a favoured political option. With the Davie loan as a starting point, history may be set to repeat itself in Canadian shipbuilding.

Contrary to the perception that it has failed to support the Canadian shipbuilding industry, the federal government has, in fact, played a pivotal and interested role in the production and construction of warships in the post-World War II era.[15] Historically, Canadian governments have turned to shipbuilding for its political and economic spinoffs as much as for the maritime security benefits of a naval fleet. Considering that past shipbuilding projects have been undertaken with such ends in mind, what impact do these imperatives have on the composition and construction of new ships for the Canadian Navy? In terms of current policy, industry capacity and naval shipbuilding desires, the answer to this question is that Canadian political and economic realities may have a significant effect on the Navy's preferred fleet structure. A pragmatic approach is required, since ship replacement programmes, particularly the Canadian Surface Combatant (CSC), are costly and history indicates that governments are willing to spend, but only to a point. As Dr. Norman Friedman suggests: "If particular platforms are becoming very expensive, then perhaps it would be better to look at different ways to

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[15]Editorial, "New Ships should be made in Canada," *Calgary Herald*, 8 August 2008. http://www.proquest.com; Internet; accessed 15 September 2008.

achieve desired overall capabilities . . . ."[16] If DND hopes to maximize the currently favourable political environment, it needs to consider a smaller, less expensive fleet which is equally capable of meeting the government's defence priorities in the early 21st Century.

[16]Norman Friedman, "Transformation and Technology for Medium Power Navies," *Canadian Naval Review* Vol 2 No. 2, (Summer 2006): 10.

CHAPTER 1 - UPS AND DOWNS: SHIPBUILDING FROM 1945 to 1996

> The collapse of the Canadian merchant shipping industry meant that the preservation of Canadian shipyards now depended almost entirely on government contracts. Thus, for domestic political and economic reasons . . . building for the RCN became the prop for the Canadian shipbuilding industry.[17]

The development of Canadian Naval shipbuilding programmes in the period from 1945-1996 contributed to a balanced fleet, one with a role and capabilities substantially different from the "workable little fleet," proposed by post-World War II (WWII) Defence Minister Douglas Abbott. [18] Nor did the Navy eventually resemble the big blue water fleet of aircraft carriers and cruisers once envisaged by Royal Canadian Navy (RCN) officers in the years immediately following WWII. In a distinctly Canadian process, the growth and development of the post-war navy reflected the ability to build capable, technologically advanced ships at home in Canada.[19] While the RCN had its own, and sometimes internally competing vision of fleet composition, the government was anxious to develop an affordable post war defence industry that would contribute to the Canadian economy and most importantly, deliver regional economic and employment benefits to strategically important electoral areas. A critical analysis of Canadian naval shipbuilding programmes in the post World War II period reveals that successive

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[17]Marc Milner, *Canada's Navy: The First Century* (Toronto, Buffalo and London: University of Toronto Press, 1999), 179.

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[18]Canada, House of Commons Debates, (23 October 1945): 1368, quoted in T.H.W. Pile, *Beyond the Workable Little Fleet: Post-war Planning and Policy in the RCN 1945-1948,* (MA Thesis, University of Victoria, 1998), 46.

[19]This point is made to illustrate that the Fleet desired by senior RCN officers in the post war era consisted of a Canadian version of a balanced Royal Navy (RN) fleet, and included aircraft carriers, heavy cruisers and numerous smaller combatants. For a critical examination of post-WWII naval planning see Piles' *Beyond the Workable Little Fleet.* Pile argues that the development of an ASW specialty in the RCN did not come as a " . . .natural progression from wartime escorts and U-Boat experience."

Canadian governments were just as determined and focused on shipbuilding as were the Navy and the shipbuilding industry. While the government had its own politically influenced goals for the industry, government involvement in naval procurement belies the popular perception that it was the Navy who had to push its political masters to build the naval fleet.

The end of World War II saw Canada with a robust domestic shipbuilding capability. Canadian yards had built over 300 warships for the RCN and Canada's allies, developing considerable domestic talent and streamlining production for all ships classes. This feat was impressive considering that few yards existed in 1939 - and those in operation had little experience in building ships of even modest size and tonnage.[20] Despite an almost standing start, and by adopting American mass production methods, the industry, with government involvement, produced some 3.5 million tons of shipping during WWII. Some ships were completed in less than 60 days.[21] However, following a surge in building in the first years of the war, the period from 1943 through 1948 saw a significant reduction in shipbuilding demand and employment.[22] Concurrently, the RCN itself dramatically downsized to a 1946 Fleet Model, which the government based on a single aircraft carrier and the recently completed *Tribal* class destroyers.[23] With no significant naval work, orders for merchant vessels rapidly dwindling and employment in

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[20]Hennessey, "The Rise and Fall of a Canadian Maritime Policy. . .," 44.

[21]*Ibid.*,58.

[22]*Ibid.*,195.

[23]In addition to Pile's Beyond a Workable Little Fleet, see Wilfred G.D. Lund's "Vice Admiral Howard Emmerson Reid and Vice-Admiral Harold Taylor Wood Grant: Forging the New "Canadian" Navy" in *The Admirals: Canada's Senior Naval Leadership in the Twentieth Century*,ed Michael Whitby, Richard Gimblett and Peter Haydon, 157-186 (Toronto: Dundurn Press, 2006).

the shipyards down 50 percent to 10,000 workers, the outlook for the Canadian maritime industry looked decidedly bleak.[24] According to Hennessey, the Canadian government did not wish to lose the indigenous shipbuilding capacity and expertise developed through a steep wartime learning curve and therefore looked to establish a post-war policy on this basis.[25] With a proven shipbuilding model in the United States, Canada was able to organize quickly a similar organization. That this structure was centered around a crown corporation, a distinctly Canadian development, suggests that the government has long recognized the benefits of supporting a domestic shipbuilding capability.

Based on the wartime success of the United States (US) Maritime Commission, the Canadian version was established in 1947 to oversee the coordination of maritime policy as well as naval and merchant ship construction. Like the US model, the Canadian Maritime Commission (CMC) sought to coordinate the shipbuilding interests of government, navy and industry within an overarching federal mandate.[26] Charged with implementing the federal policy of subsidizing Canadian shipyards, the CMC was also authorized to assign work, in some cases without competitive bidding. This special allowance suggests that the government was determined to build ships and maintain

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[24]Milner, *Canada's Navy: The First Century*, 180.

[25]Hennessey, "The Rise and Fall of Canadian Maritime Policy. . .",4.

[26]Frederick Lane, *Ships for Victory: A History of Shipbuilding Under the US Maritime Commission in WWII*, (Baltimore: Johns Hopkins University Press, 2001), 2-4.

regional benefits throughout the country, even if the ships were more expensive to build.[27]

Coincident with maintaining regional shipbuilding industries under the CMC, Canada and its western allies realized that a growing Soviet submarine fleet posed a substantial threat to the resupply of Europe as the Cold War emerged. With the experience of WWII in mind, the North Atlantic Treaty Organization (NATO), was established in 1949. Key to NATO defence plans were ". . .dedicated anti-submarine forces" to prevent Soviet submarines from interfering with the transport of supplies and reinforcements across the Atlantic[28] Given the RCN's anti-submarine warfare (ASW) experience in the North Atlantic theatre, it was natural that the Allies and the Canadian government foresaw a Canadian NATO contribution centered around this capability.

It was this strategic context that Canada's minister of defence, Brooke Claxton, defined the principal role for the RCN in the increasingly tense post war environment to that primarily of ASW.[29] This new fleet reflected US-style accommodations such as bunks instead of hammocks and cafeterias in place of mess decks. Claxton's emphasis in this area also foreshadowed the RCN's increasing relationship and interoperability with the US Navy (USN) which commenced in WWII and continues through today. In leading the way for post-WWII shipbuilding, Claxton, and the government sought to

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[27]Roland Webb, "Burrard Drydock Co. Ltd.: The Rise and Demise of Vancouver's Biggest Shipyard,"*The Northern Mariner* Vol 6 No 3, (1996) [journal on line]; available from http://www.cnrs-scrn.org/northern_mariner/vol06/tnm_6_3_1-10.pdf; Internet; accessed 18 December 2008.

[28]Peter Haydon, "Sailors, Admirals and Politicians: The Search for Identity after the War," *A Nations Navy: In Quest of Canadian Naval Identity*, ed Michael L. Hadley, Rob Huebert and Fred W. Crickard, 221-138 (Kingston: McGill-Queen's Press, 1996), 225.

[29]Tyrone H.W. Pile, "Beyond the Workable Little Fleet. . .," 99.

transform and 'Canadianize' the RCN from its British roots and connections and give it a distinctly national identity.[30] Far from being removed from the process, the government demonstrated a desire to reflect Canadian values in its post-war naval fleet.

The St. Laurent Class

The Liberal Cabinet's 1949 approval of this new fleet, focused around the ASW capabilities of the *St. Laurent* Class Destroyer Escort, heralded the beginning of a new era in Canadian shipbuilding. The procurement meant ". . . political considerations demanded that the ships and as much other equipment as possible (were) to be built in Canada."[31] While World War II shipbuilding was focused on quantity and speed of production, Cold War ship procurement was based on maintaining regional employment, political support and domestic capability.[32] Indeed the government was prepared to accept delays and substantial cost over-runs for shipbuilding projects provided the work was done in Canada. The design and production of the *St. Laurent* Class destroyers marked the first time that a sophisticated warship was purposely designed and built in Canada.[33] As part of this domestic shipbuilding production, the effort built up Canada's technical design, engineering and naval architectural capability. It introduced the

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[30]David Bercuson, *True Patriot: The Life of Brooke Claxton, (*Toronto: University of Toronto Press, 1993), 185.

[31]S. Mathwin Davis, "Naval Procurement 1950 to 1965," 99.

[32]Dan Middlemiss, "Economic Considerations in the Development of the Canadian Navy Since 1945," in *The RCN in Transition: 1910-1985,* ed W.A.B. Douglas, 254-279 (Vancouver: University of British Columbia Press, 1988), 272.

[33]Unlike the British designed Tribal Class destroyers under construction in Canadian yards until 1948, the *St. Laurents* were *designed* and built in Canada.

recurrent basis in Canadian shipbuilding that domestic design and production trump economics and, in some cases, the proven capability and timeliness of looking offshore.

The government's intent to build in Canada was acknowledged by Reconstruction Minister C.D. Howe in a 1951 statement concerning the *St. Laurent*s in the House of Commons:

> These are new types of . . . vessels of which no prototypes are yet afloat. This means that certain capital assistance is necessary, and that some delays and difficulties at the shipyards may be expected from time to time. Although Canadian shipbuilding costs are somewhat higher than European costs, it has been government policy to maintain. . .[Canadian yards].[34]

In making allowances for building an entirely new class of ship, the government also approved a "cost-plus" contract for the *St. Laurent* Class. This policy, sometimes referred to pejoratively as a "blank cheque," allows for projects to commence despite the fact that the final designs, and therefore final costs, are essentially unknown. A cost plus contract is highly desirable for industry since it allows the contracting shipyard to charge the government for all building expenses plus a percentage of those costs as profit. It follows that the greater the expenses, the higher the potential net profit.[35] Given finite fiscal resources, it is neither a desirable nor cost effective method for the government or the Navy. In building the *St. Laurents*, cost plus imposed considerable liability on the government, but it also demonstrated the government's willingness to maintain the

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[34]Canadian Minister of Reconstruction, C.D. Howe, quoted in Middlemiss, "Economic Considerations in the Development of the Canadian Navy Since 1945," 21. C.D. Howe had overseen WWII shipbuilding as the Minister of Munitions and Supply.

[35]Lane, *Ships for Victory*. . .,101.

shipbuilding industry in Canada.[36] By assuming most of the financial risk, the Liberal government of the day demonstrated a commitment to the success of the industry, the Canadian Maritime Commission and the *St. Laurent* shipbuilding project.

The attention and profile which the government gave to the building of the *St. Laurent*s is not to suggest that the RCN was disinterested and disengaged in the process, for the project's history is replete with examples of exceptional dedication and forethought. With new ships on the horizon, the RCN strove for innovation in the *St Laurents* . Commanders Al Storrs and Jeffry Brock seized the opportunity presented by the government to incorporate leading edge designs such as rounded hulls, internalized fittings and the latest in ASW weapons. Similarly, Constructor Engineer Captain Robert Baker, a naval architect loaned from the Royal Navy, is credited as the "hero' for his tireless and exceptional efforts on the project, particularly for incorporating the newest stream-driven technology in the Y-100 propulsion plant.[37]

Notwithstanding the inevitable delays in designing and building a new class of ship, *HMCS St. Laurent* was launched in December 1951 just three and half years following design approval. With Montreal-based Canadian Vickers as the lead yard, the government's desire to divide the building regionally is reflected in the fact that contracts were awarded to Vancouver-based Burrard Drydock, Halifax Shipyards and later to Marine Industries in Sorel Quebec. Summarized in Table 1.1, these distributed

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[36]Milner, *Canada's Navy: The First Century*, 182.

[37]S. Mathwin Davis, "The St. Laurent Decision, Genesis of a Canadian Fleet," In *The RCN in Transition: 1910-1985*, ed W.A.B. Douglas, 187-208 (Vancouver: University of British Columbia Press, 1988),

production efforts reflected a naval programme that "entailed developing and maintaining a regionally dispersed manufacturing capacity."[38]

Table 1.1 Major Canadian Naval Shipbuilding Projects 1949-1996[39]

Project		Time-frame	Shipyards
Destroyer Escorts	St. Laurent Class (7)	1950-1957	Halifax Shipyard (4) Davie Shipbuilding (2) Marine Industries Limited (MIL) (Sorel, QC) (3) Canadian Vickers (4) Burrard Drydock (4) Victoria Machinery Depot (2) Yarrows (1)
	Restigouche Class (7)	1953-1959	
	McKenzie Class (4)	1958-1963	
	Annapolis Class (2)	1960-1964	
AOR[40]	Protecteur (2)	1967-69	Saint John Shipbuilding (2)
Destroyers	Iroquois Class (4)	1969-1973	MIL (Sorel) (3) Davie (1)
Frigates	Halifax Class (12)	1987-1996	St. John Shipbuilding (9) MIL Davie (Lauzon, QC) (3)

[38]Hennessey, "The Rise and Fall of Canadian Maritime Policy. . .," 235.

[39]Source: Cdr (Ret'd) Ken Bowering, "Military/Naval Procurement in Canada: A Flawed Process," *The Conference of Defence Associations Institute: General Sir Arthur Currier Paper 1-08* (19 November 2008) [journal on-line]: available from http://cda-cdai.ca/Currie_Papers/Currie%20Paper%201-08%20Navy%20League.pdf; Internet; accessed 17 December 2008.

[40]The author added the row on the building of the Auxiliary Oiler Replenishment (AOR) ships.

This decision resulted in hulls entering the water at an expeditious pace, and with the approval for the *Mackenzie* and *Restigouche* class ships, a total of 20 new ships entered RCN service in the decade of the 1950s. Both the RCN and the Canadian shipbuilding industry responded to government direction to build. However, *HMCS St. Laurent's* first of class, trials and modifications illustrates the delays and costs incurred from designing and building domestically. The fact that the ship was not formally commissioned in the RCN until 1956 is a reminder that political and economic imperatives can result in considerable delay to operational employment in the fleet.

The costs associated with these domestic imperatives, combined with the cost-plus contracts were substantial, according to Hennessey in his extensive examination of post-WWII Canadian maritime policy. He points out that RCN was keenly aware that it was being used as a tool in the industrial/government relations continuum noting that "the navy favoured efforts to develop Canada's warship construction capability but grew to protest the costs associated with such an endeavour."[41] Updating this observation to the 21st century suggests the Navy should seek to maximize capability knowing that economic and political imperatives require that the defence procurement dollars be spent in Canada. By factoring increased costs from domestic spinoffs in its project estimates the Navy can champion Canadian content and production. History illustrates that such a pragmatic approach to domestic industrial capability would probably be viewed favourably by the Canadian government. However, past shipbuilding experience also indicates that when naval aspirations cost more than the government is willing to pay, even with a domestic premium, the Navy and the shipbuilding industry may lose out.

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[41]Hennessey, "The Rise and Fall of Canadian Maritime Policy:. . .," 7.

Exacerbated by disagreement within the RCN as to what its focus should be, the proposed follow-on ship to the *St. Laurent* Class showed the downside of the competing challenges of economics, politics and naval aspirations in Canadian shipbuilding.

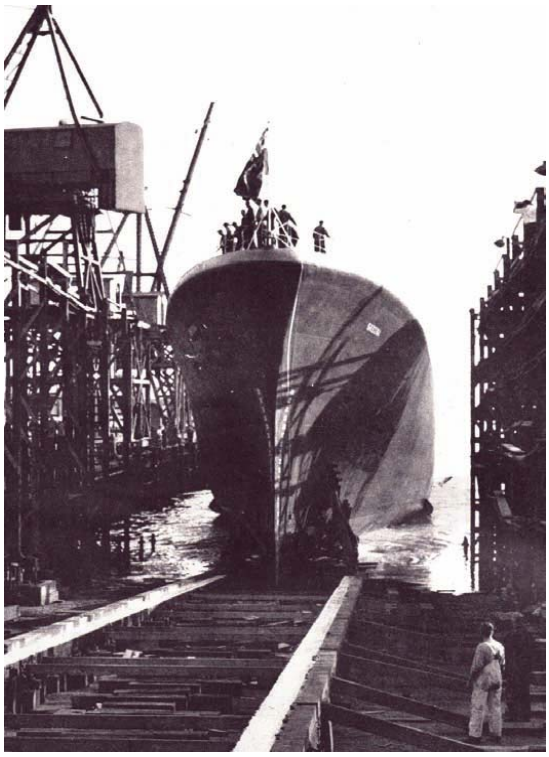

Figure 1.1 – Tangible results of the CMC: Launching a *St. Laurent* Class Destroyer Escort[42]

The General Purpose Frigate (GPF)

If the *St. Laurent* and subsequent class shipbuilding programmes demonstrated the government's commitment to support Canadian industry, the building of warships in domestic yards occurred even if it meant delays and additional costs in naval procurement. Notwithstanding the cost plus contracts and the procurement criticism which resulted, the message that government policy was to sustain Canadian shipyards emerged throughout this process. By the early 1960s, the continuous work on the *St.*

[42]Thorsteinson, "A Managed Approach to Fleet Acquisition," 29.

Laurent, *MacKenzie* and *Restigouche* Classes was complete. Canadian shipyards looked for new work and the federal government sought a way for the Navy to provide it.[43] Marc Milner touched upon the imperative of sending more work for Canadian shipyards: "Building the GPF. . .was good politics."[44] Against the favourable political environment, the Navy understandably saw the opportunity to replace the heavily gunned but aging WWII vintage destroyers with a modern, missile carrying ship.[45] This proposed change made doctrinal sense since the multi-threat capability of the growing Soviet Navy, combined with an increasing need to carry land forces in support of United Nation missions, called for a more flexible naval platform than the ASW specialized *St. Laurents.*

At the same time, the government was worried about tangible work for an ailing domestic shipbuilding industry. Political scientist Dan Middlemiss observed: ". . .the steadily dropping level of employment in the industry was a source of concern to the Diefenbaker government as the destroyer construction programme was coming to an end."[46] A dramatic decrease in shipyard employment from 15,000 in 1957 to a total workforce of 10,000 in 1960 reflected the boom-bust cycles which were beginning to become evident in the Canadian shipbuilding story.[47] Meanwhile, a decrease in demand for merchant ships provided no alternative to the industry than to seek more federally sponsored work. The shipbuilding industry was well organized and exerted considerable

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[43]Milner, *Canada's Navy*: *The First Century,* 233.

[44]*Ibid*., 233.

[45]*Ibid.*,231.

[46]Middlemiss, "Economic Considerations. . .," 21.

[47]Milner, *Canada's Navy*: *The First Century,* 233

pressure and influence on the government.[48] It is therefore no surprise that John Diefenbaker's Conservative Government sought to announce a shipbuilding programme to follow the 20 ships of the *St. Laurent* and subsequent classes.[49] By providing shipbuilding work, particularly to the Sorel and Vickers yards, the GPF could keep Canadian yards at work and pacify traditionally Liberal leaning voters in Quebec. In doing so, the government sought to use regional shipbuilding initiatives as way to influence voters.

Politics aside, the story of the GPF stands as "an illustration of the dangers the navy faces when it fails to present a united message to its political leaders." [50] When unanimity is absent, potential flaws in the argument lead to confusion and criticism in the public arena and in government at the Ministerial, Treasury Board and Parliamentary Committee levels. Add an election and change of government to the situation and the challenges of ship procurement and the need for decisiveness and clarity are even further amplified. The post-WWII period provides such a lesson in the General Purpose Frigate Program (GPF).[51] Its procurement underscored the fact that, despite a government receptive to the needs of Navy and industry, agreement within the Navy itself was essential. In an integrated force competing for scarce resources, the RCN's GPF experience is even more relevant to future fleet acquisitions.

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[48]J.W. Arsenault, "The DDH 280 Program: A Case Study of Governmental Expenditure Decision Making," In *Canada's Defence Industrial Base*, ed. David G. Haglund, 118-136 (Kingston: Frye and Company, 1988), 121. In this section, Arsenault is referring to the GPF Program as an example of the shipbuilding industry's influence on government.

[49]Rear-Admiral (Ret'd) S. Mathwin Davis, "Cancellation of The General Purpose Frigate, Lessons from a Quarter Century Ago," *Canadian Defence Quarterly* Vol. 20 No.2, (June 1990): 61.

[50]Richard Mayne, "Its Own Worst Enemy: Ship Advocacy in the RCN, 1963-1964," *Canadian Naval Review* Vol 2 No.3, (Fall 2006): 28.

[51]*Ibid.*

Proposed in Admiral Jeffry Brock's optimistic and ultimately internally contentious 1961 *Ad Hoc Report on Naval Objectives,* the GPF resulted from the need to both protect the *St. Laurent* Class from a growing air threat while introducing a platform capable of supporting land forces and United Nations Operations.[52] The GPF was envisaged as a flexible, fast, missile equipped frigate capable of not only providing area air defence but also a general purpose troop embarkation function. To this end, it was to have been equipped with medium range *Tartar* and *Mauler* surface to air missiles, a 5 inch gun and a second helicopter for administrative and troop transport purposes.[53] From early 1961 until the project's cancellation in the Fall of 1963, the GPF represented, at least publicly, the central platform in the RCN's fleet replacement programme.

The completion of the project and Brock's vision for a new class of an "all singing, all dancing ship" must have seemed a near certainty when Defence Minister Douglas Harkness announced the project in the House of Commons April 1962. For it would be unusual for a government to announce a project of this magnitude, particularly in light of the work it would bring to the Liberal opposition's Quebec ridings, without some political liaison in advance. Notwithstanding the government announcement, the RCN did not have a firm and final design for the GPF. Despite initial challenges in formalizing capabilities and propulsion plant, the RCN proceeded with the project. Davis relates that the increased cost of these incremental changes was the topic of lively discussion in the then extant Defence Supply Naval Shipbuilding Panel.[54] In less than a

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[52]Rear Admiral Jeffery Brock, *Report of the Ad Hoc Committee on Naval Objectives,* Ottawa: Royal Canadian Navy, July 1961. This document is often referred to as "The Brock Report."

[53]S. Mathwin Davis, "Cancellation of the General Purpose Frigate. . .," 61.

[54]*Ibid.*

year, per ship costs rose from $31 million in the initial estimates to more than $45 million[55] Yet, the government and the Treasury Board Secretariat remained convinced of the importance of the project, going so far as to announce that, based on its prominent design and building role in the *St. Laurent* programme, Canadian Vickers of Montreal would again be the lead yard for the GPF.[56]

Despite this optimism, elements of discord within the RCN, combined with the fall of the Diefenbaker Conservatives in the 1963 general election, led to scuttling of the GPF programme. Although the project's cancellation was generally and popularly believed to be a direct result of the Pearson Liberals' spending priorities and Paul Hellyer's personal dislike of the project, Richard Mayne's recent work in this area suggests that it was really the navy's failure to advocate effectively for the GPF which led to the project's end.[57]

As Mayne describes, Hellyer had a vision of an agile and mobile (and unified) Canadian military and, in the absence of a formal defence policy, the three services did their best to build on the new minister's prognostications.[58] Proponents of naval aviation saw an opportunity to champion their proposals for US Essex Class carriers and helicopter and troop carrying Iwo Jima class amphibious support ships as the RCN's contribution to this new, more "mobile" force.[59] Concurrently, others like Commander

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[55]*Ibid.,* 64.

[56]*Ibid.*

[57]*Ibid*., 28. The RCN itself believed that the project was cancelled due to cuts in the Liberal Defence Budget. See Peter Haydon, "Vice-Admiral Herbert Rayner: The Last Chief of the Canadian Naval Staff," in *The Admirals,* p. 268-70.

[58]Mayne, "Its Own Worst Enemy. . .," 25.

Eric Gigg opposed the GPF as having too many capabilities in one platform. Gigg, a vocal and public proponent of submarines, argued that the dollars would be better used to procure nuclear submarines.[60] While this and other details of a "dangerously fragmented naval headquarters" make for revealing insights into the leadership and personalities of those at the helm of the RCN in this period, suffice to say that with economic and political storm clouds approaching, the GPF needed to be defended with one voice.[61]

Unfortunately for Canadian Vickers, Chief of the Naval Staff (CNS) Herbert Rayner, and the staffs who had invested much time and effort in the GPF, this did not occur. Rayner attempted to promote the ship class within the RCN, but critical elements within the media and the Navy itself ensured that the project remained away from the public and minister's purview.[62] Briefing material arguing the GPF's benefits was prepared but it lacked the precision and clarity needed to keep the project going.[63] Following Hellyer's post-election announcement that he would take a "cold, hard look"

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[59]*Ibid*. In addition to the Brock Report, for more on fleet composition discussions within the RCN, see Haydon's, Vice-Admiral Rayner, and Robert H. Caldwell's, "Rear-Admiral William M. Landymore: The Silent Service Speaks Out," in *The Admirals*

[60]The Brock Report also made the recommendation that Canada acquire 6 nuclear submarines by 1973. This was, however, not popular with the Pearson Liberals who contributed their loss in the 1958 election to Diefenbaker over nuclear weapons in Canada. The submarine proposal therefore had no traction as far as the government (and many in the RCN) were concerned. For more on the submarine discussion see, Joel Sokolsky's, "Canada and The Cold War at Sea, 1945-1968" in *The RCN in Transition*, 222-223.

[61]Mayne, "Its Own Worst Enemy. . .," 27.

[62]*Ibid.*, 26.

[63]*Ibid.*, 28.

at all military procurement projects then underway, the CNS did his best to argue that the GPF project should continue.[64] It is clear even then that Hellyer saw the need to support the domestic industry, for he listened closely to Rayner's arguments in favour of the project. However, in the end, disunity ruled the day and Hellyer "saw little reason to stand up for a program that did not even enjoy universal support within the navy"[65] While Hellyer did not cite the Navy's institutional discord as a basis for the GPF's cancellation, choosing instead to blame it on excessive costs and the availability of weapons systems, Hellyer did add "that the government was aware of the necessity of keeping alive the skills that had been developed in Canada's shipbuilding industry."[66] With that obligation in mind, the government focused on building ships for the Department of Transport as an interim measure for the industry while the Navy went back to revisit its fleet procurement plans.[67]

In considering necessary capabilities and the naval fleet structure, it follows that proposals for new warships must be matched with the government's defence and foreign policy initiatives. For, in the case of the GPF, the Liberals became less interested in fighting the Cold War at sea and more focused on non-military, sovereignty protection

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[64]S. Mathwin Davis, "The Defence Supply Naval Shipbuilding Panel, 1955-1965," *The Northern Mariner*Vol 2 No 8, (October 1992) [journal on line]; available from http://www.cnrs-scrn.org /northern_mariner/index_vol_2.html; Internet; accessed 18 December 2008.

[65]Mayne, "Its Own Worst Enemy. . .," 28.

[66]DND Files, CANGEN Message No. 214, 24 October 1963 as quoted in J.W.Arsenault, "The DDH 280 Program: A Case Study of Governmental Expenditure Decision Making," 123.

[67]Milner, *Canada's Navy*: *The First Century,* 239.

roles for the CF.[68] While the GPF holds many lessons, it reinforced the theme that government policy recognized a domestic political and economic imperative to build ships in Canada. Concomitantly, the GPF story serves as a reminder that once approved, the Navy, and by extension the department, must maintain comprehensive and united support for its shipbuilding programs.

The DDH 280 Programme

Consideration of the RCN's next major shipbuilding project, the DDH 280, supports the contention that the government sought cost effective, domestic shipyard work, rather than necessarily a specific capability as paramount in the naval shipbuilding process. In addition, the DDH 280 story has relevant historical lessons for modern day naval procurement which, in the main relate to the fact that the government ordered a "Volkswagen" and the "military purchased a Cadillac,"[69] In other words, the Liberal government thought it had authorized the Navy to buy an efficient, economical and ubiquitous copy of an existing ship. However, the Navy bought a complex, expensive and cutting edge warship. A short examination of these related issues also demonstrates first, that in responding to its own and government procurement desires, the Navy must be transparent in presenting the capabilities it is seeking to provide in its recommended platform. Secondly, transparency is also required if there is a potential for significant and

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[68]Sokolsky, "Canada and the Cold War at Sea," 225. The shift to a domestic defence priority (as least for the Pearson/Trudeau Liberals) equally with NATO is found, ironically, in the Harper's Government's renewed focus on Canadian sovereignty.

[69]Arsenault, "The DDH 280 Program: A Case Study of Governmental Expenditure Decision Making," 123.

unforecast project costs which might arise based on weapon or other system availability. Finally, personnel stability among the key project offices is essential in maintaining the relationships between industry, military and government as well as to avoiding the loss of corporate knowledge and capability.

The DDH 280 project rose directly from the cancellation of the GPF program which left Canadian shipyards, particularly in Quebec without substantive work. As in the Navy's previous shipbuilding projects, the government's support of Canadian-built ships is underscored in Arsenault's critical analysis of the project:

> In 1964 there was a formally expressed concern within the government for the shipbuilding industry which needed a new program for survival. The industry relied to quite an extent on government work to keep them in the "black.". . . the result in the early sixties was a general government policy to safeguard the shipbuilding industry.[70]

Concern within the government likely stemmed from the previously noted pressure from the shipbuilding industry itself. In response to this lobby, the Pearson government directed the RCN to examine further options for ships which could be built domestically as quickly as possible and at minimal cost. [71] This contention is significant politically, since it demonstrates the lobbying power of the industry at that time. More importantly, the government, by eventually awarding the contract to Sorel, apparently wanted to shore-up its support in Quebec.

The RCN responded in late Summer 1964 by proposing three ship classes which included a repeat of the Nipigon Class, the GPF in its previously cancelled form and an

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[70]J.W. Arsenault, "The DDH 280 Program: A Model of How Not To Build Canada's Next Warship – The CPF" (Toronto: Canadian Forces Command and Staff Course New Horizons Paper, 1981), 18.

[71]J.W.Arsenault, "The DDH 280 Program: A Case Study of Governmental Expenditure Decision Making,"123.

expensive and ambitious design for a guided missile destroyer. Given the combined requirement for speed of build at minimal cost, it is not surprising that cabinet, anxious to appease the industry and maintain employment, quickly approved a $142 million dollar plan for four repeat *Nipigon* Class ships.[72] Selection of Marine Industries Limited and Davie Shipbuilding, both based in Quebec as the prime contractors suggests that the Liberal government wished to deliver the associated industrial benefits in the centre of their regional support base.[73] With drawings and a building plan already in place, these purpose-built helicopter-equipped destroyer escorts needed no additional design work and were within the capabilities of these yards. That repeat *Nipigons* did not enhance naval technological capability suggests that the Pearson Liberals hoped to provide the Navy with a new, but just as importantly, affordable, ship.[74] Besides affordability, the evidence points to the federal cabinet's desire to provide work to the industry while reinforcing voter support in Quebec.

Immediately after cabinet approved the plan, incremental but nonetheless substantial changes were made to the *Nipigon* design. These alterations included a second Sea King helicopter, surface to air missiles and a larger calibre gun. Such changes required a considerably longer and beamier ship and a larger crew than the

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[72]*Ibid.*, 124.

[73]Not as large or controversial a project, the Maritimes also received naval shipbuilding orders with the construction of the supply ships, *HMCS*' Protecteur and Preserver. Built at Saint John Shipbuilding in New Brunswick, these two ships were laid down in 1967 and delivered to the Navy in 1969 and 1970 respectively. That the work was awarded to a NB company is also suggestive of the government's desire to spread shipbuilding dollars to maintain support in an economically depressed area. This is relevant since Quebec in the 1960s had the most well developed industrial and shipbuilding capacity and was arguably better prepared to build the AORs.

[74]J.W.Arsenault, "The DDH 280 Program: A Case Study of Governmental Expenditure Decision Making," 123.

Nipigon.[75] In fact, so significant were these changes, that by 1967 the DDH 280 had become an entirely different ship from the one cabinet and Treasury Board had originally approved.[76] Such were the impact of these changes that the cost of the project almost doubled to $252 million, ship delivery was delayed by 2 years, and a Treasury Board Task Force was convened to investigate the project.

In his critical examination of the DDH 280, Arsenault argues that the sequence of events which led to a considerable embarrassment for government and suggestions of a lack of transparency on the part of the Navy, stemmed from the lack of a clear articulation or "definition" of the project. As described in the following examination of the Canadian Patrol Frigate project, there was no finite outline of specific requirements for the ship. That cabinet had approved the repeat *Nipigon* is certain, but the record shows that members of the naval hierarchy knew that changes to the Nipigon design would be required from the outset of the programme.

In spite of this apparent knowledge, neither the scope nor cost of these changes was articulated in the submission to cabinet. Given that the extant of these updates and enhancements ultimately resulted in an entirely new ship, it is not surprising suggestions were made that "some of the military bureaucracy were less than frank" about the scope of these modifications.[77] In other words, there were allegations that the Navy knew it wanted a Cadillac, and in order to get it, was obtuse in the incremental changes to the repeat *Nipigon* such that the government thought it was still getting a modified

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[75]*Ibid*., 124.

[76]Yet, because of the almost constant reorganization which characterized National Defence Headquarters in the years immediately following unification, the scale and impact of the changes were not adequately appreciated by either the CF, the government or defence procurement officials.

[77]J.W.Arsenault, "The DDH 280 Program: A Case Study of Governmental Expenditure Decision Making," 127.

Volkswagen.[78] As in the GPF, the DDH 280 programme illustrates the need for clarity and agreement between government and the Navy on the ship design, capability and overall cost before steel is cut and work commences. In this light, and as a result of the multitude of changes, missteps and project mismanagement, the 4 DDH 280 Class destroyers were finally delivered by late 1972. Perhaps it is therefore not surprising that it would be some time before the government would undertake another major program for the Navy.

The Canadian Patrol Frigate (CPF)

The launch of *HMCS Algonquin* marked the beginning of an almost 15 year hiatus in the construction of major Canadian naval ships. It was not until the keel of *HMCS Halifax* was laid in 1986 that a new ship was built for the Canadian Navy. As in the other major post -WWII naval shipbuilding projects, the *CPF* supports the argument that the government, when it decides it is in the domestic and political interest to do so will embark on a made-in-Canada shipbuilding project. As Rear Admiral David Morse has observed, the CPF construction program was the result of a "governmental crisis of conscience concerning defence and the pressures of domestic industrial capacity . . ."[79] Besides affirming government's desire to build in Canada, as in the previous examples,

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[78]Arsenault notes that changes within DND headquarters following the 280 project have now ensured the information will flow logically through to cabinet and treasury board and such a convoluted process could not happen again. Treasury Board Secretariat's updated risk management direction, some of it based on audits from the DDH 280 and other DND procurement programmes is located at Canada, Treasury Board Secretariat, *Risk Management Policies*, available from http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/riskmanagement/siglist-eng.asp; Internet; accessed 6 April 2009.

[79]Rear Admiral (Ret'd) David Morse, "Force Development: A Demand Well Beyond 2015," *Canadian Naval Review* Vol 4 No. 1, (Spring 2008): 3.

an examination of the CPF program reveals contemporary lessons for naval procurement initiatives.

Initially dubbed the Ship Replacement Program (SRP), the CPF was the result of a DND directive to develop replacement options for the aging *St Laurent Class* ships. Throughout the early to mid 1970s, Maritime Command worked to refine the necessary capabilities in the SRP. [80] In a departure from previous shipbuilding projects, the navy did not design a specific ship or make a list of "must have" requirements; instead the senior naval leadership submitted its desires in the form of *essential* and *desirable* capabilities.[81] Known in modern parlance as a Statement of Requirement (SOR), these were, in turn, passed to Treasury Board for consideration. The economic downturn and hyper-inflation that followed the 1973 Energy Crisis led to reduced federal revenues. With money in short supply, national defence, a low priority under the Trudeau Liberals, made ship replacement a hard sell. It was therefore not until October 1977, that the cabinet approved the project. Even then, the government reinforced the emphasis on domestic content and ". . .laid down a number of conditions, mostly dealing with the use of the project to stimulate Canadian shipbuilding, electronic and other high technology

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[80]Following unification of the CF, the RCN became CF Maritime Command. With this came an army rank structure and green uniforms. Land based rank terminology did last long in the naval environment. However it was not until 1984 under the Mulroney Conservatives that the CF returned to distinctive environmental uniforms In the 1990s, the establishment of environmental staffs within a unified CF command structure led to the elements being again identified by their distinctive branches. More recently, the three elements have come in practice to be referred to in their pre-unification titles, ie. The Navy (as this author has used). However they remain titles within a unified organization and single service construct.

[81]Michael Young, "No, That Wasn't How We Really Got Here,"*Canadian Naval Review* Vol 2, No.2, (Summer 2006)*:* 30. Requirements, rather than a specific platform specific driven process. remains the procurement policy in effect today.

industries."[82] It is therefore relevant to expect that future programs will require the same level of Canadian content provisions.

With these domestic stipulations in place, work continued through the various stages of contract definition, ship design, shipyard selection and eventually the laying of the keel for the first ship, *HMCS Halifax*. Eventually, *Halifax* was delivered almost 14 years after the SRP was approved and a full nine years after Treasury Board approved Saint John Shipbuilding's sole compliant bid to build the CPF.[83] Besides the noted requirement for Canadian content, part of this significant delay is explainable by the fact that almost 15 years had passed since the shipbuilding industry had designed and built a warship in Canada. Technology had changed and as in the case of the newest technological innovations used in the *St. Laurent* build, the CPF was designed using the latest modular or sectional process.[84] The time required to adjust to evolving technology was exacerbated by the hiatus in naval shipbuilding. It meant that the industry needed time to recruit skilled workers, retrain where their existing labour force where necessary and re-tool their yards for specialized warship construction.[85] The salient point was that the government was prepared to accept this delay since it meant that the ships would be designed and built in Canada.[86] As in the *St. Laurent* discussion, the Navy would have

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[82]R.F. Archer, "The Canadian Patrol Frigate," *Canadian Defence Quarterly* Vol 14 No. 2, (Autumn 1984): 13.

[83]Milner, *Canada's Navy*: *The First Century.*, 277. Modern parallels to this protracted process are found in the JSS project. Proposed in 1999, ten years have passed and notwithstanding that much work has been done, the JSS has not yet successfully completed the project definition phase.

[84]*Ibid.*

[85]Built in modules with a high level of automation, the CPF project required newer skills than traditional shipbuilding methods.

[86]Michael A. Hennessey, "Canadian Shipbuilding . . . ," 24.

preferred to have had its new ships delivered much earlier but had to accept that developing domestic capability and assured domestic employment trumped expedient platform delivery.[87]

It is historically and thematically relevant to observe that such domestic economic requirements had regional political ramifications which contributed to the delay in production discussed above. In the case of the CPF, political turmoil resulted when Treasury Board announced in 1982 that Saint John Shipbuilding (SJSL) was to be awarded the contract over the Montreal-based SCAN Consortium.[88] Given the value of the CPF contract, this decision caused much consternation and a near revolt within the Trudeau government when Quebec MPs learned that their constituents and a deserving shipyard in Quebec would not receive this coveted project.[89]

Legal processes and administrative reviews followed in the debate over which yards would build the first batch of CPFs. Litigation involving SJSL, SCAN and the Federal Government followed. These issues were eventually resolved and the Sorel yard in Quebec yards built three of the ships under contract for SJSL. Equitable distribution of work – or at least the perception of regional parity - impacts the government's efforts to maintain and develop domestic capability. To the department's credit, the decision to tie the CPF and Tribal Class Update and Modernization Project (TRUMP) allowed Treasury board to address Quebec political and economic interests. The solution was found in awarding the $1.4 billion TRUMP to Quebec - based yards and firms. Hence

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[87]Whitby *et al*. *The Admirals. . .*, 329.

[88]The SCAN bid was initially one billion dollars more than SJSL's bid. SCAN lowered their bid to match their competitors; however Treasury Board determined that it was non-compliant as a result.

[89]Milner, *Canada's Navy*: *The First Century*, 289.

"...the political reality of linking shipyard work to electoral ridings became a factor" and this egalitarianism exacerbated the technical and human resource delays in the CPF project.[90] These delays could have been mitigated had this solution been recognized from the outset. In a broad sense, the irony of the situation was that the same regional pressures which contributed to the delays in the CPF project resulted in the best possible outcome for the Navy. With 12 new frigates plus 4 modernized air defence platforms capable of robust task group command and control functions, the need for governmental Industrial Regional Benefit (IRB) requirements proved fortuitous for the Navy since it contributed to the completion of an additional capability and platform update in the TRUMP process.

Consideration of the CPF project is another illustration of the Canadian government's profound involvement in naval shipbuilding. In addition to supporting the theme that the government will authorize and proceed with new, built-in- Canada ships when it is economically necessary to do so, the CPF study also holds useful lessons for the Department of National Defence (DND) to apply to the next shipbuilding projects. In the main, three issues emerge for consideration. First, there is no doubt that the technological capabilities of the contractors involved affect any procurement project. However the scale of and value of warship building programs increases the number of stakeholders and those vying for a part of the project. Naturally, this fact results in delays while the prime bidders assess the compliance and abilities of their potential subcontractors and further delays after the awarding of a contract as shipyards establish the technical and human resources necessary to proceed with building. For example there

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[90]*Ibid.,* 190.

was a nine year interval between the CPF Project approval in 1977, the awarding of the winning bid in 1982 and the commencement of work in 1986.[91] While there is little dispute that the CPF has been the right ship to meet Canadian defence and naval commitments through the last two decades, the consideration going forward illustrates the need to get the platform requirement and capabilities correct from the outset since the process, as it currently stands, takes too long to re-design a ship after the fact.[92]

A second additional consideration of the CPF suggests that expectations for the rapid production and introduction of a new ship should be tempered by the implications of regional distribution and the potential for delays as economically driven, political benefits are established and discussed. This fact is clearly not within the Navy's purview to assess or even to contribute; however, recognition of this reality speaks to the need for a pragmatic approach to ship procurement. As discussed above, the government equates the need for economic benefits in Canada to be an integral part of the process. Given the maintenance, readiness and operational impact of keeping an aging fleet at sea, the Navy should therefore develop planning guidance and fleet programs which consider appropriate time delays in ship introduction. This reality speaks to the need for reasonable introduction timelines and contingency plans for service extension. In the case of the CPF, its *St. Laurent* predecessors remained in service beyond their forecasted replacement dates.

The third and most significant consideration of the CPF project addresses economics and illustrates the point that governments have been historically willing to

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[91]Whitby *et al*., *The Admirals*. . ., 329.

[92]As noted in the DDH 280 programme, making significant changes after project approval is fraught with peril and can lead to suggestions of a lack of transparency in the process.

proceed with shipbuilding even in economic downturn. While Canada has not seen the drastic affects of hyperinflation, the current economic climate has many parallels to that of the mid 1970s and early 1980s and the commencement of the CPF project:

> And so the rebuilding began – in the midst of a recession, . . .a weak dollar and mounting unemployment. Perhaps for those very reasons the CPF project, with its myriad spinoffs in virtually all aspects of Canadian industry and with enough largesse to buy political peace where needed, was a good bet . . . "[93]

Reflection on this situation is relevant since it reinforces the government's historical practice to support large scale naval shipbuilding, particularly in times of economic slowdown. This is tempered, however, with the fact that the SRP planned for 3 batches of 6 CPFs each. As good a political bet as 12 CPFs were, economics precluded the building of the final six ships.[94] This is also important since it shows that warship procurement is ultimately a discretionary governmental purchase and must compete with other domestic priorities. By spreading investment and employment through the industrial sectors, the government can make the purchases more attractive and saleable to Canadians. Yet, opponents of building in Canada (the subject of further discussion in subsequent chapters) argue that better value for money can be obtained from building offshore. They point to the CPF to illustrate that less expensive ships could have been procured from our allies. While strict quantitative assessments support this point, they do

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[93]Milner, *Canada's Navy*: *The First Century*, 290.

[94]D.W. Middlemiss and J.J. Sokolsky, *Canadian Defence: Decisions and Determinants*, (Toronto, Harcourt, 1989): 205.

not consider the government's demonstrable desire to support Canadian industry, even in the 1980s when federal revenues were decreased by a major recession.

CHAPTER 2 - COMPETING GOALS: POLICY, POLITICS AND CAPABILITY

> Shipbuilding and ship repair are very much a part of Canada's proud maritime tradition – three oceans, an immensely long coastline, skilled and dedicated workers and businesses, and a long-proven ability to design, build, repair and operate excellent vessels. So make no mistake: shipbuilding is part of our heritage. It is not and should not be viewed as a "dying industry."[95]
>
> - Brian Tobin, 2001

The launch of *HMCS Ottawa* in 1995 marked the end of the construction phase of the Canadian Patrol Frigate (CPF) project. Since then, Canadian shipyards have delivered the last Maritime Coastal Defence Vessels (MCDV) and replaced the Navy's aging fleet of wooden hulled training craft. However, while considerable planning and staff work has been undertaken, there have been no major shipbuilding projects in the intervening years. Plans to replace almost the entire current major warship fleet with new support ships, surface combatants and a flotilla of arctic-capable patrol vessels suggest that the current hiatus in procurement is about to end. As depicted in Figure 2.1, The Conservative government's *CFDS Defence Strategy* (*CFDS*) outlines $60 billion in planned defence equipment acquisitions, of which ship replacements comprise a substantial portion. Describing the need for new ships as an important defence acquisition challenge, Chief of Defence Staff (CDS), General Walter Natynczyk, noted that tanks and aircraft can be purchased off the shelf to meet defence demands, but ships have to be built, the sooner the better.[96] The General's comments are underscored by the

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[95]Hon. Brian Tobin, Minister of Industry (2001), quoted in Industry Canada, National Shipbuilding and Industrial Marine Partnership Project. *Breaking Through: The Canadian Shipbuilding Industry*. (Ottawa: Information Distribution Centre Communications Branch Industry Canada, 2001), available from http://www.shipbuilding.ca/graphics/MINIbreaking_e.pdf; Internet; accessed 10 February 2009.

fact the Navy's fleet is aging: even the newest CPF is almost 15 years old and maintenance and operating costs for the frigates and their older consorts comprise a significant portion of the Navy's budget.

Naturally, the Canadian defence industry, led by the Shipbuilding Association of Canada (SAC), supports any upcoming federal shipbuilding projects. In addition to the Navy's recommendation for a policy which would bring stability and predictability in ship replacement, the SAC, defence associations and others in the academic and political communities argue that the upcoming naval projects represent a watershed moment, when a continuous or steady state shipbuilding program in Canada could be realized. Besides naval work, their position is supported by a need for wider government fleet renewal with the Coast Guard, Fisheries and Oceans and the Royal Canadian Mounted Police (RCMP) all requiring new ships in the next decade.[97] Accordingly, proponents suggest that such a program will allow sufficient time for the marine industry, the Navy, Public Works and Government Services Canada (PWGSC) and other interested federal government departments, to develop and implement designs, manage workloads and allocate work within domestic capability.[98] In light of government policy and stated

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[96]Chris Lambie, "New Ships Will Allow Forces to Shape Up," *Halifax Chronicle Herald*, 20 January 2009. available from http://thechronicleherald.ca/cedrom_archives/; Internet; accessed 15 February 2009.

[97]Canada, National Research Council, "Marine and Ocean Industry Technology Roadmap, Final Report," (Ottawa: 11 February 2003), 19.

[98]Thorsteinson, "A Managed Approach to Fleet Acquisition," 28.

intention to build these ships in Canada, the challenge for DND is to move swiftly to seize the existing opportunity.[99] Those in the shipbuilding industry must ask themselves to what extent it has the capacity and capability to undertake such significant government work.

Complicating the situation is the reality that politics plays a key role in shipbuilding decisions: defence is the greatest discretionary government expenditure behind health care and ships comprise the single most expensive individual equipment component. As Stone and Solomon note, shipbuilding and other defence acquisitions have been "used to promote a wide variety of political and social interests in regional and industrial development."[100] In other words, the reality in Canada is that shipbuilding and regional economic development should be viewed as two interconnected and symbiotic elements. Given these regional imperatives, combined with the monetary impact of a major shipbuilding announcement, it is not surprising that governments wish to build ships in Canada. Regardless, some people still posit that offshore purchases are a viable, if not the preferred, solution to Canadian warship procurement.

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[99]For the purposes of this paper, DND refers to the CF (including the Navy) along with the department's procurement, material and finance branches. That is to say all those involved departmentally with ship design and requirements, project development and financial submissions in the Department of National Defence. In terms of specific roles and responsibilities in the overall government procurement process, DND is considered the technical authority while PWGSC is the contract approval and contract signing authority. See, Alan Williams' *Reinventing Canadian Defence Procurement: A View from the Inside,* Kingston: McGill-Queen's University Press, 2006, 76.

[100]J. Craig Stone and Binyam Solomon "Canadian Defence Policy and Spending," in *Defence and Peace Economics* Vol 16 No. 3, (June 2005): 161.

The Offshore Argument

Following the August 2008 postponement of JSS, a trip to the Netherlands by a retired Canadian admiral led to allegations by the industry and the media that the government had decided to look offshore to reduce the project's costs.[101] Notwithstanding the fact-finding nature of the visit, the attention which the trip received illustrates the sensitivity that even the speculation of buying warships evokes.[102] Proponents of buying offshore suggest that given the need for economic subsidies to the domestic industry, combined with a lack of global competitiveness and a non-existent international market for Canadian warships, that the government simply cease building at home and allow market forces to run their course.[103] They suggest that better value for money could be achieved by purchasing offshore. In some instances, where there is no domestic capability this is correct. As the CDS noted recently, items like Leopard tanks and Boeing C-17 Globemaster aircraft were purchased from our NATO partners with relatively little difficulty. With a domestic Canadian industry, ships, however, are an entirely different matter. Furthermore, political pressure to spend public dollars at home, combined with recent government statements reinforce intentions to build the federal fleet in Canada.

Others suggest that Canada follow precedents set in Australia, Denmark and the United Kingdom and seek to buy and modify commercial platforms for naval use.[104] In

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[101]David Pugliese, "DND Under Fire For Scoping Out Dutch Shipyard," *Ottawa Citizen*, 6 August 2008: www.proquest.com; Internet; accessed 15 September 2008.

[102]The Netherlands are also considering building a JSS like ship.

[103]Sing, "Procuring Warships for the Canadian Navy: Does Canada Spend Its Money Wisely? 5.

[104]Doug Thomas, "Warship Developments: To Buy or Lease?" 39.

the Australian example, a new double-hulled Greek tanker was purchased and converted into the Fleet Tanker, HMAS *Sirius,* for a fraction of the cost of new naval construction. From a purely monetary perspective, such a purchase has the potential to generate cost savings by taking advantage of overseas subsidies and production runs. More importantly though, oversea procurement would amount to a tacit recognition on the part of the Canadian government that it was willing to assume all risks and vulnerabilities associated with purchasing from foreign or overseas suppliers. As a recent editorial argued, Canada is too significant a power "to depend on foreign yards for its navy, even if buying offshore would save a few dollars."[105] Notwithstanding the drought in government shipbuilding, accepting the loss of the domestic industry through foreign naval procurement is not in keeping with the *CFDS*.[106] Relying on other countries for something as tangible and substantive as a warship does not coincide with the *CFDS* requirement to operate and project leadership overseas.

The Navy's own strategic guidance speaks to its aspirations to maintain presence and interoperability with larger forces worldwide.[107] Having a domestic warship building ability is an integral part of this equation. As Todd and Lindberg declare, ". . . any navy worth its salt should have a matching shipbuilding industry."[108] In this light, the Navy would be hard pressed to maintain credibility with its NATO and coalition

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[105]Editorial, "New Ships Should be Made in Canada," *Calgary Herald,* 8 August 2008.

[106]The argument is based on an historically proven domestic capability to build surface ships. Therefore it does not include submarine construction (although Canadian Naval Fleet Maintenance Facilities and the Washington Marine Group are gaining considerable experience in their repair and maintenance).

[107]Department of National Defence, *Leadmark: The Navy's Strategy for 2020,* (Ottawa: Directorate of Maritime Strategy, 2001), 112.

[108]Daniel Todd and Michael Lindberg, *Navies and Shipbuilding Industries: The Strained Symbiosis* (Westport, CT and London: Praeger,1996), 1.

peers if it had to rely on a third power to provide both its ships and ship repair facilities. Even if this power was the United States, a trusted neighbor and ally with whom Canada shares the continent and whose economy is inextricably integrated with our own, it would still amount to the tacit loss of any domestic capability. This is not to suggest that Canada should not take advantage of this relationship to build USN designs at home, merely that buying directly from the US still incurs substantial political and security risk. For Canada's naval requirements would undoubtedly and understandably rank second in priority to those of the US.

Others suggest that replacements for Canada's warships can be obtained, in part, through the purchase or lease of merchant ships. They argue that this represents an expedient and cost effective way means of procurement.[109] However, extreme caution is required given past experience with the purchase of *HMCS Moresby* and *HMCS Anticosti*. These ships proved only marginally effective as inexpensive minesweeping training platforms. However, with the possible exception of their vast cabin spaces and huge water tanks, they had no-sea keeping capability and proved to be wholly inadequate for use in the Canadian naval environment off the East and West Coasts.[110] These examples illustrate the challenges of buying platforms which are designed and built for purposes and environments outside Canada.

In addition to strategic interests and economic imperatives of domestic shipbuilding, there is also the important factor of national economic, technological and

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[109]Doug Thomas, "Warship Developments: To Buy or Lease?" 40.

[110]These Minseweeping Auxillaries (MSA) were purchased inexpensively in Greece and refitted in Canada. They were intended as an interim measure in advance of the MCDV project. They were ill-suited to the Canadian environment and were plagued with problems ranging from power incompatibility to a lack of spare parts.

industry capability. As Treddenick suggests, it is necessary to consider defence spending, and in this instance, domestic shipbuilding, as a "means of contributing to the entire range of national goals."[111] If nation building by means of research and industrial growth and economic development are all factored into the equation, the government and people of Canada should be prepared to absorb the incremental cost of building domestically.

Canadian Government Policy

A broadly based, regionally diverse ship construction program is within the scope of current Canadian governmental policy. This policy is shaped largely by two key government documents, the 1986 Cabinet Policy on Industrial Regional Benefits and *Focusing on Opportunities*: *A New Policy Framework of the Canadian Shipbuilding and Industrial Marine Industry. Focusing on Opportunities* emerged from a Fall 2001 federal government request for recommendations on revitalizing the shipbuilding and marine related industries in Canada. Representatives of the industry submitted a detailed report the following Spring to Industry Minister Brian Tobin. Titled *Breaking Through*, the report detailed a number of ways to improve future prospects for the industry.[112] Pertinent to naval shipbuilding, was the recommendation that the government:

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[111]John M. Treddenick, "The Economic Significance of the Canadian Defence Industrial Base, in *Canada's Defence Industrial Base*, ed. David G. Haglund, 15-48 (Kingston: Frye and Company, 1988), 18.

[112]Notable among the many recommendations from the ship building industry was a request that the Canadian government impose tariffs on vessels built in countries which were heavily subsidizing their shipyards. One example was South Korea, where subsidies ranged from 20 to 40 percent. To help combat this problem, the government introduced a 25 percent tariff on foreign built ships. Unfortunately, as described in *Breaking Though*, the tariff does not apply to larger fishing vessels, nor does it cover the 15 percent subsidy delta enjoyed by South Korean shipbuilders. These exemptions weakened Canada's ability to compete globally in non-naval markets.

> Recommit to the policy of procuring, refitting and overhauling in Canada (while eliminating) the peaks and valleys of procurement for the Navy and the Coast Guard through more effective forward planning and thereby keep order books and employment levels more consistent over the longer term.[113]

This recommendation speaks to the very nature of Canadian shipbuilding, since it tacitly recognizes that the industry requires federal projects to remain stable and financially viable over the long term.

Significantly, the government response to *Breaking Through* recognized shipbuilding as an "important contributor to national and regional economies" and affirmed that, subject to operational necessity, the government will continue to build and repair the federal fleet in Canada.[114] In addition, Industry Canada acknowledged the need for the technological upgrades and revamped training, pledging to work with other departments and governments to develop opportunities and benefits for the industry.[115] *Focusing on Opportunities* accepts the complexity and significance of government ship purchases, but it makes no pledge to eliminate the cyclical nature of procurement.[116] Thus, current Industry Canada policy incorporates the pledge to build domestically, but the government, at least as far as *Focusing on Opportunities* is concerned, is not committed to a specific building programme.

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[113]*Breaking Through: The Canadian Shipbuilding Industry*.

[114]Industry Canada. *A New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry: Focusing on Opportunities 2001*. (Ottawa: Information Distribution Centre Communications Branch, 2001); available from http://www.shipbuilding.ca/graphics/response-nc.pdf; Internet; accessed, 10 February 2009. 20

[115]*Ibid.*, 21-22.

[116]*Ibid*., 17.

The government's long standing IRB Policy is another government process which, from a government perspective, favours shipbuilding in Canada. Established by the Mulroney Conservatives in 1986, the IRB program was created to ensure that Canadian industry obtains economic benefit from defence procurements. Thus, even if the prime or main contractor in a project is not Canadian-owned, policy requires that they must make purchases or investments in Canada in amounts generally equal to the contract awarded.[117] To this end, IRB policy requires that prior to the Request for Proposal stage, companies actively seek out Canadian capabilities for possible economic and business partnerships. The policy makes it clear that IRBs are not intended as equalization nor equitable distribution programs. However, potential bidders are "strongly encouraged" to contribute to regional economic development through the scope of the contract.[118] For contractors, this requirement is a relatively small trade off to ensure that they are not shut out of the process. Also applicable to naval capital acquisition is the fact that IRB policy applies to all defence procurement projects in excess of $100 million. With even modest building programs exceeding this figure exponentially, it follows that there are many interested parties, all looking for part of the associated economic benefits.

Considering warships are the single most expensive weapon procurement made by the government - which in the case of the CPF replacement project – is close to $26

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[117]Industry Canada, The Industrial and Regional Benefits Policy, http://strategis.ic.gc.ca/epic/site/ad-ad.nsf/en/ad03658e.html; Internet; accessed 15 February 2009**.** 1. Boeing was required to do so in Canada's recent purchase of 4, C-17 Globemaster transport planes.

[118]*Ibid*. Provincial governments also have similar regional investment stipulations. For example, Nova Scotia and Encana came to an agreement wherein Encana promised offsets in a specified number of regional jobs (among other things) in exchange for production rights to the Deep Panuke gas field near Sable Island. Part of the offsets include the construction of an offshore supply vessel at Halifax Shipyard creating some 200 jobs in the process.

billion [119]- it is not surprising that shipbuilding creates considerable economic and regional interest. Competition and lobbying can be intense, despite stipulation within the IRB policy that contractors are not bound to particular Canadian regions or to particular companies. For example, the CPF project felt the impact of regional politics when the Quebec-based SCAN group was unsuccessful in its bid to build the CPF. While contract cost was undoubtedly a factor, the government's decision was also informed when "Saint John proposed a very comprehensive procurement and industrial benefits package."[120] Although a compromise was reached which shared the work between NB and QC – and was ultimately to the Navy's advantage - the equitable distribution of IRBs do not always lead to more naval capability. The 1960 Mackenzie Class build is an example where the need to maintain shipbuilding work through the regional distribution of federal procurement dollars led to a ship which was less operationally capable than it might have been otherwise.[121]

While IRBs serve to reinforce the case to build domestically, they also demonstrate the political pressures behind defence procurement in Canada. As Stone and Solomon observe:

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[119]This is a current estimate of project costs for the Canadian Surface Combatant. For JSS, the contract definition phase valued the building at $2.1 billion with an additional $800 million, 20 year, in-service support contract. The shipyard portion of the CPF modernization is approximately $3.1 billion.

[120]D.W. Middlemiss and J.J. Sokolsky, *Canadian Defence: Decisions and Determinants*, (Toronto, Harcourt, 1989), 202.

[121]The *Mackenzies* represented the end of the decade long steady state building program which commenced in 1949 with the *St. Laurent* Class. However they lacked the flight deck and hangar necessary to embark a Sea King helicopter as well as surface to air missiles and updated sonar systems. Then Chief of the Naval Staff, Vice-Admiral Harry DeWolf, was forced to compromise platform capability in order to acquire new hulls. Despite these capability deficiencies, the *Mackenzies* ships kept domestic yards busy for another 3 years but, once at sea, barely "fulfill[ed] operational requirements." Only the last two, *Annapolis* and *Nipigon* were fitted with helicopters, which made them effective as ASW platforms. See *The Admirals*, 226.

> … the expenditure of taxpayers' money on major capital equipment will always involve the issues of economic offsets, regional development and supporting Canadian industry. Regardless of the economic cost this is the reality of Canadian procurement and the need to sustain at least a minimum level of defence industrial capacity.[122]

The government wishes to create employment, assist in regional economic development and contribute to a basic shipbuilding capability in Canada, while also maintaining or increasing its own popularity at a time when other sectors are asking for additional economic stimulus. The fact that Canada's major shipyards are located on the coasts, away from the manufacturing hubs in Southern Ontario, means that future projects are an ideal way for the government to achieve regional economic diversity and political goodwill outside Central Canada. [123] Warship construction, one opposition MP argued recently, is an excellent way to provide employment stability to regions hard hit by the economic downturn.[124] Accordingly, continued demands for greater federal financial stimuli may well encourage the Conservatives to expedite naval building, given the continued recessionary affects on the economy in general.

Another federal initiative that supports government intentions and domestic construction of ships is the 1996 *Advantage Canada* policy. This strategic program, sponsored by the Department of Finance, was designed to reinforce investment at home and contribute to Canadian economic prosperity. Through a variety of federally sponsored initiatives, *Advantage Canada* seeks to stimulate job growth and create wealth

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[122]Stone and Solomon, *Canadian Defence Policy and Spending,* 162

[123]With the exception of the Davie Shipyard in QC, Canada's main yards are in Nova Scotia and British Columbia. With is closure in 2003, SJSL in NB is not included.

[124]House of Commons, *Debates*, Mr. Jack Harris, (MP St. John's East, NDP) Friday, 21 November 2008 http://www2.parl.gc.ca/HousePublications/Publication.aspx?Language=E&Mode=1&Parl=40&Ses=1&DocId=3614314; Internet; accessed 23 March 2009

for all Canadians.[125] One of the pillars of this program is the government's promise to establish "conditions for Canadian business and organizations to thrive."[126] Through this program, the government pledges to contribute to the development and maintenance of the skilled workforce necessary to create economic opportunities. As noted recently by Defence and Atlantic Gateway Minister, Peter MacKay, the shipbuilding and marine industry is one which can sustain skilled jobs in Canada.[127] With an aging workforce and diminished by years of low production, the SAC has suggested that the technical apprentice benefits under the *Advantage Canada* umbrella could help build the skilled labour pool the government is seeking by building ships in Canada and employing Canadian apprentices on the projects.[128] Indeed such sentiments were reflected by Prime Minister Harper in announcing that procurements under *CFDS* would provide employment and economic stability for defence dependent industries and communities.

As discussed previously, the government has been an integral part of the domestic shipbuilding equation, going so far, as in the case of the DDH 280 project, to propose a procurement that the domestic industry could undertake. In the current context, when "shovel ready" projects are the order of the day, DND may need to expedite its

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[125]Canada, Department of Finance, "Advantage Canada, Building a Strong Economy for Canadians," Summary. November 2006. Internet; http://www.fin.gc.ca/ec2006/plan/pltoc-eng.asp.; Internet; accessed 30 March 2009.

[126]*Ibid.*

[127]Murray Brewster, "Fed Eyes Shipbuilding as Economic Stimulus," available from http://cnews.canoe.ca/CNEWS/Canada/2008/12/14/7748116-cp.html ; internet; accessed 18 February 2009.

[128]Peter Cairns, "Shipbuilding Transformation,", Shipbuilding Association of Canada – Articles, 22 May 2006. available from http://www.shipbuilding.ca/articles/article_may22-06.shtml; Internet; accessed 15 October 2008.

shipbuilding projects and proposals in order to get its share of federal stimulus dollars.[129] With the *CFDS* outlining a specific priority of the government's shipbuilding and repair intentions, it is clear that the government is serious about its commitment to update the naval fleet. The challenge for DND remains getting these (and other) projects underway while the political will and the money are both available. It is therefore worthwhile to consider current naval projects and their potential contribution to the national economy and shipbuilding capability.

Recent Naval Shipbuilding Proposals and Projects

First and recently noteworthy is the JSS project. This project grew from a requirement to replace the Navy's two, Canadian built-but rapidly aging, *Protecteur* Class fleet replenishment ships (AORs).[130] In an effort to increase its utility and to provide a broader range of joint capability options, the project's essential requirements transformed it into an exceptionally capable but tremendously expensive ship.[131] One defence analyst observed that the plan to replace the AORs, which began in the 1990s, has undergone numerous changes as the navy adapted to the strategic, transformative and joint realities of the CF.[132] As defence commentator Martin Shadwick acknowledged,

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[129]The term has been used frequently in the media to describe projects which are ready to commence work and therefore qualify for federal stimulus dollars.

[130]The JSS Statement of Operational Requirements (SOR) notes that the project also includes the replacement for *HMCS Provider*, an older AOR which was paid off in 1998. See JSS SOR at http://www.forces.gc.ca/admmat-smamat/jss-nsi/documents/JSS_SOR_V_4.1.pdf; Internet; accessed 23 March 2009.

[131]The argument can be made that given the 30 plus year expected service life of these ships, 3 ships with these capabilities for less than $1 billion each is not a bad investment.

[132]Sharon Hobson,"Plain Talk," *Canadian Naval Review* Vol. 1 No.4, (Winter 2006): 28. Hobson refers to the "political climate" as the basis for the Navy's amendments and capability inclusions to JSS. It

these joint capabilities made JSS the "maritime cornerstone of the government's logistical equipment support and renewal package."[133] However, equipment funding, even for "joint" weapons that reflect the transformational focus of the CF, is not unlimited. It is also possible that DND is recalling its lessons from the DDH 280 program, where incremental additions to an approved project design resulted in enormous cost overruns, delays and allegations of a lack of transparency on the part of the Navy and the Industry.

Viewed in this context, it is advisable for all parties to have a clear understanding of the project's issues before construction commences, since shipbuilding is a complex and costly endeavour where delays and compromises are inevitable. Canadian shipbuilding historical experience illustrates that the current JSS contract challenges should be viewed as a set back and not be construed as change in government policy to build offshore. The Navy, however, may have to consider the number of ships in the project versus the capability they deliver. As Haydon has pointed out, what the Navy wants is not always what it gets.[134] In the case of JSS, a complex platform, finite budget combined with a domestic construction imperative may result only in one-for-one replacements for *Protecteur* and *Preserver* without the flexibility that a third JSS would

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follows that the Navy had pinned hopes for approval on the JSS' "jointness" and the "broad range' of capabilities it would provide to the government.

[133]Martin Shadwick, "Maritime Futures," *Canadian Military Journal* Vol 8 No.1, (Summer 2007) [journal on-line]; available from http://www.journal.forces.gc.ca/vo8/no2/index-eng.asp; Internet; accessed 22 January 2009.

[134]Peter Haydon, "Choosing the Right Fleet Mix: Lessons From The Canadian Patrol Frigate Selection Process," *Canadian Military Journal* Vol 9 No.1, (Spring 2008) [journal on-line]; available from http://www.journal.forces.gc.ca/vo9/no1/index-eng.asp; Internet; accessed 15 January 2009.

provide. It follows that the government is also looking to a smaller, less complex and more easily built domestic construction project.

Such a vessel is found in the proposed Arctic Offshore Patrol Ship (AOPS). An integral part of *CFDS*, AOPS is a clear indicator of Conservative defence priorities. Accordingly, it was announced by the Prime Minister in July 2007 as part of a multi-pronged government approach to enhance sovereignty and presence in the North. Outlined in Figure 2.1 and valued at $3.1 billion, the six to eight AOP vessels represent just over 20% of the $15 billion, first phase, CF equipment renewal under the *CFDS*. Given the value of the project, it is not surprising that the Prime Minister was quite clear that ships would be "custom-designed and built in Canada."[135] Viewed against federal policy such as *Focusing on Opportunities, Advantage Canada* and the regional economic spinoffs of *IRBs* such intentions gain traction and reinforce the theme that government wishes to build ships for the Navy in Canada. That the PM delivered the announcement himself, rather than delegating it to a Cabinet Minister or member of the government caucus, is further evidence of the government's intention to complete the AOPS.[136] Meanwhile, as JSS is revisited and AOPS progresses towards contract definition, shipyard work is close to commencing on a third naval project.

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[135]Rt.Hon Stephen Harper, "Prime Minister Stephen Harper announces new Arctic offshore patrol ships," speech at HMC Dockyard Esquimalt, BC 9 July 2007, available from http://pm.gc.ca/eng/media.asp?category=1&id=1742; Internet; accessed 26 February 2009.

[136]Peter Cairns, "A Flood of Announcements and What They Mean.," Shipbuilding Association of Canada - Articles 13 August 2007; available from http://www.shipbuilding.ca/articles/article_aug13-07.shtml; Internet; accessed 15 September 2008.

Canada First Defence Strategy – Total Defence Spending
2008–09 to 2027–28 (Accrual Numbers)

PILLAR	AMOUNT	% OF TOTAL	REMARKS
Personnel	$250B	51%	70,000 Regular and 30,000 Reserve personnel by 2028; includes 25,000 civilian workforce
Equipment			
– Previous Announcements	$15B[1]	3%	Previously announced equipment purchases, including: • C-17 Globemasters • C-130J Hercules • Arctic/Offshore Patrol Ships • CH-47F Chinook Helicopters • Trucks
– New Major Fleet Replacements	$20B[2]	4%	• Fixed-wing Search and Rescue Aircraft • Destroyers and Frigates • Maritime Patrol Aircraft • Fighter Aircraft • Land Combat Vehicles and Systems
– Other Capital	$25B	5%	Includes individual weapons, communications equipment, etc.
Infrastructure	$40B	8%	Increased investment in rebuilding and maintenance of infrastructure of approximately $100M/year
Readiness	$140B	29%	Approximately $140M/year in new spending on spare parts, maintenance and training
Total Spending over 20 Years	**$490B**	**100%**	

Figure 2.1: *CFDS* Defence Spending[137]

The recent formalizing of the shipyard refit phase of the Halifax Class Modernization (HCM) contract provides contemporary evidence that the government wishes to support the domestic marine industry. As in the case of AOPS, this intention was reflected in the PM's statement that "all of the work done on the ships will be done right here in Canada by Canadian companies."[138] The $3.1 billion shipyard portion of the Halifax Class Modernization (HCM) programme will bring tangible and immediate benefits to the defence and ship repair communities on both east and west coasts. Besides that, HCM provides some breathing room for DND, the government and other departments in selecting the most affordable, politically acceptable and economically realistic overall federal fleet mix.

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[137] *CFDS.*

[138] Rt. Hon. Stephen Harper, "Prime Minister Harper announces Navy ship upgrades," Speech at HCM Dockyard Halifax, 5 July 2007, available from. http://pm.gc.ca/eng/media.asp?category=1&id=1730; Internet; accessed 26 February 2009.

Given the inherent compromises necessary in naval procurement, it is not surprising that recent considerations for ship replacement projects have evoked numerous discussions and opinions from within government, the Navy and the shipbuilding industry. While expectations of cost and scale may have to be tempered, history suggests that the government will not use the current recession to depart from the spending outlined in the *CFDS* Strategy. Rather the opposite is most likely, with the government viewed by the public as pragmatic enabler given that the shipbuilding initiatives will provide jobs and regional support – particularly in Quebec and Atlantic Canada where the current government needs to increase its popularity if it hopes to form a majority in the next election. The fact that the Conservative Government's recent budget made no cuts to defence allocations suggests that the government views the military as not only strategically important for Canada's strategic interests but also for the economic benefits obtained through military equipment and infrastructure spending.[139] While the 2009 federal budget focused only on relatively small volumes of Coast Guard work, recent media statements from MacKay suggest the government may be looking at shipyards as a means to inject more stimuli:

> There is enough work for the Canadian shipyards on both coasts and in Quebec to keep people employed, and to keep that sector of the economy going full-tilt. I see this as being in keeping with economic stimulus and getting people to work. And there's enough work in these projects to get all of these shipyards humming again.[140]

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[139]Canada, Department of Finance, *Budget 2009* available from http://www.budget.gc.ca/2009/plan/bptoc-eng.asp.Internet; accessed 1 February 2009. It also demonstrates to the US that Canada is serious about its continental defence commitments under the CFDS. The naval implications of continental defence will be considered in Chapter 3.

[140]Murray Brewster, "Fed Eyes Shipbuilding as Economic Stimulus,"

The Minister's Parliamentary Secretary, Lawrie Hawn, stated subsequently in the House of Commons that the government intends to spend "billions of dollars on ships over a 20-year period. [and] that work will be done in Canada."[141] These and other statements indicate that the government is considering shipbuilding in its recession fighting options.

Using naval shipbuilding to stimulate economic growth and renewal in periods of financial distress has historical precedent not only in Canada but in the United States (US) as well. At the height of the Great Depression, US President Franklin Roosevelt leveraged his experience as Under Secretary of the Navy to initiate a naval building program designed to help get legions of unemployed back to work. Roosevelt's building programme also met a strategic need to rebuild an aging US fleet. The Canadian Navy of today faces a similar need for renewal.[142] Despite competing domestic pressures for New Deal funding, Roosevelt recognized that an "effective navy was essential for national security, but also that the shipbuilding industry...could be an economic stimulus for the country as whole."[143] To Roosevelt's credit, his programme worked. It was a pragmatic long term investment that provided jobs, contributed to social stability and gave the USN ships on the eve of WWII. This is significant because Canada in 2009 is faced with similar naval and economic conditions and the US depression experience suggests that a hastened shipbuilding stimulus programme can contribute to renewed economic growth. Although the Canadian shipbuilding industry was disappointed that the 2009 budget did

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[141]House of Commons, *Debates*,(Lawrie Hawn, MP, Edmonton Centre, CPC) Monday 2 February 2009. available from http://www2.parl.gc.ca/HousePublications/Publication.aspx?Language=E&Mode=1&Parl=40&Ses=2&DocId=3636715 ; Internet; accessed 25 March 2009.

[142]Frederick Lane, *Ships for Victory*, 10.

[143] Peter Haydon, "Shipbuilding: An Infrastructure Initiative that Makes Strategic Sense as Well," *Canadian Naval Review* Vol 4 No. 4, (Winter 2009): 35.

not include extensive shipbuilding stimulus, the government's post WWII history suggests that funding will be applied to shipbuilding and associated high technology industries.[144] However, before embarking on such a project, it is important to note that since is has been almost 14 years since the last major surface warship was completed, the question of industry capacity must be considered.

Industry Desires and Shipyard Capacity

The preceding pages support the contention that the Canadian government wishes to pursue its historical precedent of building warships in Canada and, while there is no doubt that the CPF Project "demonstrated that industry can coalesce around a requirement," industry capacity is significantly less than what it was when *Ottawa* was launched in 1995.[145] In fact, a 2003 report for the National Research Council stated: "At present Canada has no military shipbuilding capacity,"[146] and observed that this problem is exacerbated by a lack of critical infrastructure and experienced workers.[147] Table 2.1 describes the major shipyards in Canada and notes that, with the exception of Kiewit in Marystown NF, none have built any vessels over 5000 tons since 1995. This shortcoming suggests that if Canada is to embark on an extensive federal building

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[144]Haydon, "Shipbuilding: An Infrastructure Initiative:. . .," 36. With naval demand expected to be in the order of $9 billion for JSS, HCM and AOPS alone and not including the SCSC project, it not surprising that the government wishes to spend its naval procurement dollars in Canada. With local and provincial authorities turning to Ottawa for financial stimulus, shipbuilding is a "logical infrastructure project" with "potential benefits in just about every part of the country." As noted, the impressive dollar value of naval projects is impressive and has the potential to draw votes to the Conservative Party.

[145]Commodore R.W. Greenwood, Evidence at the Standing Committee on National Defence, 22 February 2007. available from http://www2.parl.gc.ca/CommitteeBusiness; Internet; accessed 15 October 2008.

[146]Canada,National Research Council, "Marine and Ocean Industry Technology Roadmap," (Ottawa: 11 February 2003): 30.

[147]*Ibid.*, 20.

program, significant and extensive investment in shipyard equipment, training and personnel are required.

Table 2.1 Major Canadian Shipyards

Yard	Location	Employees[148]	Specialty	Last Warship Construction	Remarks[149]
Washington Marine Group[150] (includes Vancouver Drydock, Vancouver Shipyards and Victoria Shipyards)	North Vancouver and Victoria, BC	1200	1. Cruise Ship Repair and Maintenance. 2. Coastal tug, barge and log towing/trade.	1. Orca Class Patrol Vessels (2008) 2. Refit Contract for *HMCS Victoria*'s Extended Work Period (Ongoing)	1. Desire for continued small ship construction (eg. Orca Class) 2. Teamed with SNC Lavalin for JSS Contract proposal 3. 2 floating drydocks in North Vancouver. 4. Adjacent to PWGSC's Esquimalt Graving Dock in Victoria. 5. Naval work and refit experience 6. Awarded shipyard phase HCM contract for West Coast CPFs. 7. US owned. 8. Built "Fastcat" ferries for BC Provincial government in 1990s. Still has assembly sheds in situ.
Allied Shipbuilders[151]	North Vancouver, BC	Varies	1. Ship Repair 2. Smaller Vessel/Tug construction 3.Ferries.		1. Bid on Orca Project 2. Able to build vessels to 400' and 10,000 tons 3. Recent build of MV Kuper for BC Ferries.

[148] Precise current data on shipyard employees is difficult to obtain. The employment estimates above are based on comparison and compilation of data from *Breaking Through* and Vice-Admiral Peter Cairns' (Ret'd) "Shipbuilding and Industrial Preparedness." As Cairns notes, the temporary and contract based nature of the work makes finding consistent figures a challenge. Davie data is taken from its website at http://www.davie.ca/eng/default.aspx

[149]The shipyards' building preferences are taken from SAC Chairman Andrew McArthur's evidence at the Standing Committee on International Trade.. See Canada, House of Commons, Standing Committee on International Trade, *Minutes of Proceedings and Evidence*, Tuesday 3 March 2009.Available from http://www2.parl.gc.ca/HousePublications/Publications.aspx?DocId=3711341; Internet; accessed 23 March 2009.

[150]Washington Marine Group, "Shipbuilding and Repair," available at http://www.washingtonmarinegroup.com/_global/_content/aboutus.htm; Internet; accessed 7 April 2009.

Yard	Location	Employees[148]	Specialty	Last Warship Construction	Remarks[149]
Halifax Shipyards[152]	Halifax NS	1800	1 Ship Repair and Maintenance 2. Naval refit work 3. Small, complex vessel design and construction (tugs and supply vessels)	Maritime Coastal Defence Vessels (MCDV) (1999)	1. Desire for AOPS 2. Currently building offshore supply vessel for Encana. 3. Naval work and refit experience. 4. Awarded shipyard phase HCM contract for East Coast CPFs. 5. Irving Family also owns the smaller East Isle Shipyard in PEI. 6. 2 Floating drydocks (one capable of Panamax Size Ships) and graving dock. 7. Decommissioned SJSL, sent much of the equipment to Halifax.
Davie Shipyard[153]	Levis, QC	1000	1. Offshore supply and construction vessels construction and repair	Built 5 of 12 CPFs DDH 280 TRUMP	1. Desire for larger vessel construction 2. Recent federal government loan Required considerable financial assistance from the QC government. 3. Only existing non-public, non-floating graving dock capable of holding a JSS sized ship.
Kiewit Offshore Servcies[154]	Marystown, NF,	500	1. Ship Repair 2. Oil Platform construction	Nil	1. Teamed with Thyssen for JSS contract proposal 2. No graving dock
Seaway Marine and Industrial[155]	St. Catherines, ON	150	1. Ship repair 2. Lakes and Seaway Vessel Construction	Nil	1. No recent naval work 2. 2 Drydocks 3. Has done naval repairs and refits. HMCS Haida museum ship work.

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[151]Allied Shipbuilders Limited. “Shipbuilders, Ship Repairers and Marine Engineers,” available at http://www.alliedship.com/index.php/products_services/; Internet; accessed 19 April 2009.

[152]Halifax Shipyard, “Shipbuilding,”available at http://www.irvingshipbuilding.com/marine; Internet; accessed 7 April 2009.

[153]Davie Shipyards, “Shipbuilding,” available at http://www.davie.ca/eng/default.aspx?ID=business_461174; Internet; accessed 7 April 2009

[154]Kiewit Offshore Services, available from http://www.kos.nfld.net/content/marystown.html; Internet; accessed 7 April 2009.

[155] Seaway Marine and Industrial “Shipbuilding,” available from http://www.seamind.ca/index.php?screen=shipbuilding; Internet; accessed 9 April 2009.

Given Canada's historical shipbuilding experience, it follows that any infrastructure investments have to be factored into cost of a project.[156] For example, the Mulroney government contributed almost $400 million for equipment and training at the SJSL and Davie yards in order to get construction started on the CPF, bringing the total project bill to $9.54 billion.[157] Although one time expenses, these start up costs and processes contribute to project delays and in particular a usual delay in the delivery of the first ship in a class.[158] Unrealistic in light of the global shipbuilding environment, the hope for the CPF project was that such infrastructure and training investments would set up both SJSL and Davie for continued success in the commercial market. The reality however was quite different since SJSL " . . .was unable to acquire enough non-government contracts to remain viable."[159] The irony of the situation was reflected in the fact that in 2003, the federal government underwrote the costs of paying to dismantle the yard and retrain SJSL employees.[160] Reinforcing the cyclical nature of the industry, it has been more politically and economically advantageous for the government to fund the required shipyard start-up costs than to provide continually federal work. Without significant naval shipbuilding work in the last decade and a half, it is not surprising that the capacity and capability of Canadian yards to build warships has diminished.

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[156] Hennessey, *The Rise and Fall of a Canadian Maritime Policy*. . .,. 44

[157]Ty Curran, "The Single Shipbuilding Entity Model in Canadian Naval Procurement: A Discussion Paper on Naval Contracts in Canada. Journal *of Military and Strategic Studies* Vol 8 No. 3, (Spring 2006): [Journal on line]: available from http://www.jmss.org/2009/winter/index2.htm; Internet; accessed 18 March 2009.

[159]*Ibid.*, 3.

[160]*Ibid.*

Despite this hiatus, the SAC has a more optimistic outlook for the Canadian industry. Its president, Peter Cairns notes: "Canadian yards have more capacity than is generally realized."[161] However, much of this capability is based on the reality that the marine and shipbuilding industry is divided into two general elements; the shipyards that do the actual construction, repair and maintenance and the marine sector that produces designs, manages supply and manufactures marine equipment.[162] In the case of the former, and with the help of a lower dollar, Canadians yards have developed a niche in cruise ship, and luxury yacht refit and repair.[163] Similarly, the small East Isle Shipyard on Prince Edward Island has earned a world class reputation for the design and construction of tugs,[164] while the Irving -owned Halifax Shipyard has developed a similar reputation in the repair and construction of vessels for the oil and gas industry.[165] Despite localized successes, the design and manufacturing section has experienced more difficulty competing in the globalized shipbuilding industry.

Based on higher production costs as well as an abundance of skilled but inexpensive labour overseas, Canadian yards have not been competitive in the design or construction of larger vessels. Add to this a "brutally competitive" global shipbuilding industry able to leverage economies of scale through high rates of construction and with considerable excess capacity worldwide; Canadian shipyards are at a severe

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[161]Peter Cairns, "Shipbuilding and Industrial Preparedness."*Canadian Naval Review* Vol 2 No. 3, (Fall 2006):20.

[162]Thorsteinson, "A Managed Approach to Fleet Acquisition," 30.

[163]Curran, "The Single Shipbuilding Entity Model in Canadian Naval Procurement", 3. See also "Marine and Ocean Industry Technology Roadmap," 6.

[164]Marine and Ocean Industry Technology Roadmap, 24.

[165]*Ibid.,* 6.

disadvantage.[166] Nonetheless, as Greenwood argues, domestic shipbuilding should not be viewed as a sunset industry but rather one which recognizes the need to evolve constantly using the latest technologies and best practices.[167] Certainly, striving for industrial efficiency and technical innovation are important, but the fact remains that domestic yards require federal government work in order to be economically viable and to operate on the scale necessary to build warships. Cairns notes that potential naval and government projects are necessary to provide the boost that the industry requires to operate at an economically sustainable level.[168] In arguing for tangible policies which will assist the future of the industry, the Chair of the SAC bluntly states that without government involvement in the process, the entire domestic industry could be in jeopardy.[169] In other words, Canadian builders need federal projects and guidance to revitalize and maintain the industry.

In conjunction with the need to rejuvenate the naval and fisheries and oceans fleets comes a call for a change in government procurement and shipbuilding policies. In addition to advocating for a continuous building paradigm, the industry has proposed three centres of excellence, each focused on a particular ship type. For example, the SAC suggests that Davie Shipyard, with its large drydock, would build JSS while Halifax

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[166]Captain (N) R.W. "Greenwood, Globalization, Maritime Strategy, and the Survival of the Canadian Marine Industry," (Toronto: Canadian Forces College, National Security Studies Course Paper, 2005), 37.

[167]Commodore R.W. Greenwood, "Striving for Sustainable Warship Design and Construction," Presentation to Naval Summit 29 April 2008, 5. with permission.

[168]Peter Cairns," Shipbuilding Demand and Capacity," 30 October 2006: available from http://www.shipbuilding.ca/articles/article_oct31-06.shtml; Internet; accessed 15 September 2008.

[169]Canada, House of Commons, Standing Committee on International Trade, *Minutes of Proceedings and Evidence*, No.1,Tuesday 3 March 2009.available from http://www2.parl.gc.ca/HousePublications/Publications.aspx?DocId=3711341; Internet; accessed 23 March 2009.

Shipyards would be responsible for the AOPS.[170] While details of this proposal have yet to be resolved either within the industry or the government, it is worthwhile to note that this model is based on industrial alliance constructs in use in England, the US and Australia. Well suited to periods of economic uncertainty and "rapid technological change," Project Alliancing is founded upon open dialogue and relationship building.[171] Given the uncertainties which accompany shipbuilding – particularly in Canada with new and unproven designs like JSS – Project Alliancing is a model which could contribute to the goals of all interested parties.

Supporters of the Project Alliancing model point to it as a way to address the government's deliberate avoidance of risk in the procurement process.[172] With the reduction of the Combat Systems Integration portion of the HCM to one qualified bidder as an example, the current Canadian model where the contractor takes the risk may be increasingly untenable. A recent Currie Paper argued: "The government also mandates how and when it will pay for the procurement [and] passes the financial risk to bidders who must also take responsibility for all schedule and technical risk."[173] The government's desire to have industry assume these obligations may, in part, arise from its past shipbuilding experience. As noted in Chapter 1, the government bore the brunt when it assumed all risk in the *St. Laurent's* cost-plus construction process. Later, during the

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[170]House of Commons. Standing Committee on International Trade, *Minutes of Proceedings and Evidence*, no. 1, 3 March 2009. Testimony of Andrew McArthur, Chairman, Shipbuilding Association of Canada

[171]Jim Ross "Introduction to Project Alliancing." available from http://www.alliancingassociation.org/Content/Attachment/Introduction%20to%20Project%20Alliancing%20-%20Jim%20Ross%202000.pdf. Internet; accessed: 29 March 2009.

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[172]Bowering, "Military/Naval Procurement in Canada. . ."

[173]*Ibid.*

similarly funded DDH 280 program, the government was forced to contribute an additional $110 million to complete the project.[174] Using post-WWII shipbuilding experience as a basis, it is not surprising that governments want to assign the financial risk to the builders.

Referring to the current procurement and risk management situation, Greenwood points out, that "professionals have to make money at this business (if not on the first ship) then at least over the term of the contract."[175] Accordingly, if any chance at a reasonable profit has to be absorbed by the contractor assuming all risks, as has been the case in Canada, there is little incentive to bid on a project. It follows that if the government wants to build ships in Canada, it will have to assume a greater portion of the risk currently borne by the industry. As in the St. Laurent project, the government assumed risk in the past and statements in CFDS indicate that it is willing to resolve these issues in future projects.[176] This element of *CFDS*, combined with the Conservative government's pro-defence views and the recent economic downturn, suggests that the Navy is in an advantageous and unusually beneficial position in which to embark on new procurement projects.

Politics, Economics and Continuous versus Batch Building

However, prudence and pragmatism should be watchwords for the Navy as it attempts to take advantage of the current fluid economic situation. As noted earlier, the marine and shipbuilding industry, the Navy, and many defence analysts and politicians

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[174]J.W. Arsenault, "The DDH 280 Program A Model of How Not To Build Canada's Next Warship – The CPF," 11.

[175]Commodore R.W. Greenwood, "Striving for Sustainable Warship Design and Construction,"

[176]*CFDS.*, 20.

see a continuous build policy as the best, long-term solution for Canada. In the main, it would remove the cyclical, boom/bust pattern of federal procurement while providing a predictable delivery and replacement schedule. Building one ship every 18 months, or roughly six to seven ships per decade would allow the industry to work within its current yard capabilities while concurrently allowing for platform modernization and incremental design changes.[177] As the Chief of the Maritime Staff described: "If one looked at the whole workload over the course of 25 years, the best thing to happen for the Canadian shipbuilding industry would be to have something that was predictable and without any peaks and valleys but rather a general loading."[178] Although appealing, it does not fundamentally resolve the politics of shipbuilding or the dilemma of a government faced with increasingly high unemployment and an immediate need to stimulate and maximize job growth.

Understandably, proponents of the continuous build paradigm point to the years of secure employment for shipyard and allied industries' that a steady state program would provide [179] With many regions and manufacturing sectors clamouring for immediate stimulus funds, the government may be in no mood to commit to a steady state naval building programme. Defence Minister Mackay's recent comments suggest that the government is looking to stimulate to fill capacity as quickly as possible. Obviously,

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[177]Robert H. Thomas, "Comments on Shipbuilding and Industrial Preparedness," *Canadian Naval Review* Vol 2, No.1, (Spring 2007): 30.

[178]Stephen Trimble, Canada seeks to kick-start sustained shipbuilding plan," *Jane's Navy International* (1 December 2006): http://proquest.com; Internet; accessed 2 February 2009.

[179]In this context, a continuous or sustained building program is one that is based on building a combination of multiple ships of different classes over an extended time period such that the industry is consistently delivering new platforms to its customers Phrased another way, it would be like buying a new car every for 20 or more years.

politicians are eager to maximize immediate benefits for their own regions. Consequently, naval aspirations for steady state building may have to be tempered. Politics and economics have definitely reentered the shipbuilding debate. Phrased in this context, defence spending is "about jobs, incomes and profits, benefits that are easily measured [and] readily entered into the political calculus."[180] Considering the cost of warships, shipbuilding may be one of the most dramatic ways for the government to demonstrate its commitment to areas of the country which have been, or may be affected by the current economic downturn.

As Middlemiss and Sokolsky observe, government defence spending can have significant and positive economic benefits in many regions of the country.[181] Given the financial magnitude of warship construction, combined with calculations which suggest that naval projects could create up to 6760 person years of employment, it is no wonder that shipbuilding is a politically sensitive process.[182] In a time of rising unemployment ship construction presents a large number of regionally diverse, highly skilled, potential job creation opportunities in the government's recession-fighting arsenal. While the Davie announcement may have served to ameliorate concerns -particularly during the recent JSS contract challenges - that government was no longer interested in supporting Canadian shipbuilders -the government's intention to complete the project was supported by Public Works and Government Services Minister Christian Paradis who stated that ". . .these vessels are a key priority of the government."[183] Besides reinforcing the

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[180]Treddenick, "The Economic Significance of the Canadian Defence Industrial Base," 23.

[181]Middlemiss and Sokolsky, *Canadian Defence: Decisions and Determinants*, 129.

[182]Cairns, "Shipbuilding Demand and Capacity."

commitment to the project, Paradis' comments suggest that the government is keeping its options open before committing to a particular shipbuilding policy. Since getting the ships is the overarching concern, it follows that DND should follow suit in adopting an approach whereby it is prepared to adapt to either continuous or batch building.

Despite broadly based agreement that a continuous build policy makes solid, long term sense for Canada, it may not provide enough economic stimuli or political goodwill to satisfy the federal government. Given the political pressure to take strong measures to stimulate the economy, the Navy and the industry could find themselves in a situation where the funding for several programs is approved, but they lack the complete, critically assessed and strategically relevant designs. Such a flood of ship orders could challenge the Navy's ability to provide experienced and consistent project oversight and leadership. Similarly, as one defence industry official observed: " . . . there is neither the capacity in the domestic industry nor in the federal government to develop, manage or implement all (potential) programs at the same time."[184] For the Navy, this might mean having to bring additional staff officers to the National Capital Region with a resulting reduction of capability and manpower on the coasts. For example, a surge in project staffing requirements in Ottawa might mean combining Fleet and Sea Training Staffs, reducing or combining Formation level headquarters functions and combining functions of some project offices with other federal departments. Understandably, such changes could mean reduced personnel flexibility for the Navy of today; however it would result in significant potential and capability in the next Canadian Naval Fleet.

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[183]Sharon Hobson, "Budget and Compliancy Issues Scupper JSS Plans," *Jane's Navy International* (3 September 2008): http://proquest.com; Internet; accessed 16 February 2009.

[184]Thorsteinson, "A Managed Approach to Fleet Acquisition." 28.

Making compromises and adjusting to the impact of conditions may continue to be the order of the day as DND works to refit and replace its aging surface fleet. Policy debates aside, the importance of the discussion comes down to acquiring the most strategically relevant and flexible fleet possible within the Canadian economic and political reality. The government has clarified its position to build in Canada through policy and confirmed its intention through numerous recent statements. However, it has not committed to the DND or industry vision of a steady building process. With this in mind, the Navy needs to adopt a pragmatic approach and be prepared for a possible surge in building ships which will have to last well into the 21st Century. The next chapter considers three possible fleet options for Canada.

CHAPTER 3 - BLUE AND BROWN: FLEET OPTIONS IN THE 21st CENTURY

The Canadian government has played and continues to play a pivotal role in the naval shipbuilding process. However "the right ships to do all the anticipated tasks are almost prohibitively expensive, and so it is a question of balancing ends and means in a highly competitive environment."[185] Given finite financial resources, the government has had to balance naval platform goals and the shipbuilding sector's need for federal projects with competing demands for social, economic and regional spending. The result has often been a protracted and politically sensitive process with delayed warships, increased platform costs and modified or compromised capabilities.[186] Such problems have been exacerbated by the ad hoc nature of defence procurement. For the Navy in 2009, the result has been an aging fleet, half of which has seen over 30 years of service.

The *Canada First Defence Strategy* (*CFDS)* outlines the government's plans to rebuild the aging naval fleet but makes no promises that the Navy's new warships will have service lives any shorter than those in the current fleet. Although, it does promise a "A New Relationship" with industry it does not promise unlimited funds or a continuous building policy. In fact, history suggests that the government's desire to build affordable warships as a means to providing both economic stimulus and defence requirements will result in a flurry of shipbuilding activity in the next decade. Accordingly, a ship delivered in 2015 could potentially still be in Canadian naval service in 2050 or beyond.

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[185]Editorial, "The Naval Procurement Predicament," *Canadian Naval Review* Vol No.2, (Summer 2006): 2.

[186]Michael A. Hennessy, "Canadian Shipbuilding. . .,"23.

Naval historian Richard Gimblett observed: "the simple fact is that the imminent procurements will complete a fleet of platforms which, aside from incremental systems upgrades, could be in service for the next half century.[187] Viewed in this context it is therefore necessary to consider carefully the next fleet from both a shipbuilding as well as a fleet capability perspective.

Notwithstanding that a steady state building program could allow for incremental modifications and improvements as lessons were applied and technologies advanced, reality and economics require that Canada get the composition of the future fleet right. Regardless of surge or continuous build, the government's past actions, current policies and recent statements all indicate that the Navy's next fleet will be built in Canada and can expect to see service over a significant portion of the first half of the 21st century. Has the Navy embarked on the right path in seeking to recreate an expanded but contemporary version of its current fleet? In a rapidly changing world there will be little time to correct miscalculations.

Reflecting the government's strategic priorities in an increasingly interconnected world, *CFDS* provides a useful starting point in considering the composition of the next Canadian Naval Fleet. What is more, the government has linked the *Advantage Canada* program, mentioned previously, and the new defence strategy with the stated intention of bolstering the defence sectors in Canada. Combining these recent strategic documents with the government policy to build in Canada suggests that the next fleet not only be within the construction capabilities of the domestic industry, but it must also meet the requirements of "delivering excellence at home, defending North America and

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[187]Richard Gimblett, "A 'Transformational' Fleet for the Canada in The 21st Century," *Maritime Affairs* (Spring/Summer 2000), 42.

contributing to international peace and security" as outlined in *CFDS.*[188] Against these broad requirements, and with the perspective that the government's ultimate priority is the protection of Canadian sovereignty and citizens, this chapter considers three potential, built in Canada, fleet compositions: Option One, a task group-centered, blue water force (a new version of the current fleet), Option Two, an expanded AOPS/littoral fleet structure, and Option Three, based on the development of a specialized role with a JSS as the core of the fleet.[189] For practical purposes, these options are based on a surface fleet of 15-18 ships and 6-8 AOPS as outlined in *CFDS.*[190]

Option One: The CSC-Centered Blue Water Task Group

First to be considered is the ocean-going task group-based fleet. This option, centered on the proposed Canadian Surface Combatant (CSC), is designed to replace and expand upon the capabilities in the Halifax Class frigates (CPF/HCM) and Iroquois Class destroyers (TRUMP).[191] Based on experience with these platforms as well as their

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[188]*CFDS*, 7-8. *CFDS* outlines governmental ambitions for the CF to conduct six core missions: (1) Conduct daily domestic and continental operations, (2) Support a major international event in Canada (3) Respond to a major terrorist attack, (4) Support civilian authorities during a crisis in Canada, (5) Lead and/or conduct a major international operation for an extended period and, (6) Deploy forces in response to crises elsewhere in the world.

[189]With long-term manning and concept of ops for the AOPS not yet finalized, the author has deliberately excluded MCDVs from the discussion. However, it is expected that naval reserve personnel will contribute to the AOPS personnel structure. It is also reasonable to assume that the Naval Reserve would potentially play a key role in any new, more robust coastal patrol capability.

[190]There are many in academic and political circles who argue convincingly for a much larger Canadian Navy than that outlined in *CFDS.* Prominent historian J.L. Granatstein, along with Senators Colin Kenny and Hugh Segal, suggests that defending *CFDS* means a future fleet comprised of almost 60 ships. With a force consisting of a mix of SCSC, JSS, AOPS and an amphibious capability (aka the Hillier's "big honking" ship), they argue the Navy would have the full range of capabilities needed to meet Canadian interests domestically and worldwide. Based on government stated intentions, historical precedent and the current economic environment the discussion here is limited to more realistically attainable ship numbers.

experience in the current security context, this is the Navy's preferred fleet model. Accordingly, the development of long-term replacements for these ships is a high priority and remains the most significant concern in maritime force development.[192] Known in naval strategic parlance as Canada's "fourth fleet," this composition will look much like the Navy of today.[193] However, appearances aside, these new ships will incorporate leading edge defence technologies and, as Commodore Williams notes, will "have far greater operational flexibility" than the current "third fleet."[194] In an effort to ensure the ". . . capacity for independent, sustainable and sovereign action at sea," that a task group provides, the Navy has already invested considerable staff and planning work in replicating this capability going forward.[195] At a time when ship replacements and shipbuilding is garnering media attention, the recent deployment and Canadian leadership of Task Force 150 was intended to demonstrate publicly, to Canadians, the utility and versatility of the existing naval task group concept. As *Leadmark 2020* states, a Canadian task group "needs to offer a broad range of capabilities with both military and political appeal in the evolving environment postulated for 2020."[196] Hence the Navy

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[191]Project lexicon has been through several iterations. Ships variations and names included the Frigate Replacement (FRP) and Destroyer Replacement (DRP) and CADRE (Canadian Air Defence Replacement)

[192]Commander Larry Trim, Lieutenant Commander Paul Forget and Lieutenant Commander David Kazmirchuk, "The Canadian Navy in 2007: An Overview and a Look Ahead," *Canadian Naval Review* Vol 4 No.1, (Spring 2008): 26.

[193]Peter T. Haydon, "Building the Next Fleet: A Discussion with Commodore Kelly Williams," *Canadian Naval Review* Vol 4 No.1, (Spring 2008): 18. Commodore Williams was Assistant Chief of the Maritime Staff (A/CMS) until March 2009. He is referring to the Navy's Fourth *Post WWII* Fleet.

[194]Haydon, "Building the Next Fleet. . .,"18.

[195]*Leadmark*, 108.

[196]*Ibid*. Task Force 150 is the coalition-based, Maritime Interdiction Operations Warfare Commander in the US' Central Command Fifth Naval Fleet. Leadership of this position revolves through

has taken every opportunity to demonstrate Option One's continued relevance in the 21st century.

Option One remains within the scope of domestic industrial capability, meets the third of *CFDS*'s requirements by providing the platform necessary to contribute to international peace and stability and has been identified as a major fleet replacement project. The Canadian Surface Combatant (CSC) is very much predicated on the utility and flexibility of today's composition. Certainly the CPF, TRUMP and AOR based fleet have allowed the Navy to provide government with flexible responses to a range of events from Canada's contribution to Hurricane Katrina to this country's leadership and contribution to Operation Enduring Freedom in the Arabian Sea and Gulf of Oman.

It follows that maintaining command and control in addition to the area air defense currently provided by TRUMP is essential if the government wants the Navy to continue to provide a similar level of leadership through the 21st century.[197] Noteworthy are the Navy's recent task force contributions to the US-led campaign against terrorism, as well as similar contributions to the NATO Standing Maritime Group (SMG). However, *CFDS* states that the top priority for the CF is national defence; simply replacing what currently exists based on past performance without careful consideration of future requirements against government strategic goals will not be adequate. Who can accurately predict the requirements in 2050, 2030 or even 2020? When compromises are necessarily combined with an imperative for economic stimulus and a precedent of

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participating coalition partners. Canada held a similar leadership position in the US' Fifth Fleet area of responsibility during *Op Apollo* in 2003-2004.

[197]Replacing the command and control capabilities in TRUMP is a cornerstone of the Navy's doctrinal plans. The ability to run coalition-based ops with the US and other like minded countries has proven its utility in the post 9/11 era.

affordable shipbuilding, the government may eventually see replacing the status quo as too expensive to build with more "flexibility" than Canada requires for a continental-focused defence strategy. As one retired admiral argues:

> But the naval plans are plans to preserve what is. They offer little in the way of new thinking and their appeal may wane as other demands come to the fore. Without a compelling and publicly accepted argument for the 'new fleet'. . . the government and Canadians are not likely to accept a long term tax mortgage simply to meet naval aspirations.[198]

Indeed with a projected cost of $26 billion, replacing the existing surface fleet with 15-18 Canadian Surface Combatants will be a significant financial undertaking.[199] While the introduction of accrual accounting allows this cost to be amortized over their expected 30 year plus service life, Option One— and indeed all other fleet options – will have to share in the $45-50 billion dollars allocated for new equipment in *CFDS*.[200] Since this figure includes other equally expensive CF procurement needs, such as fighters, helicopters and new maritime patrol aircraft, compromises may be required early in the requirements process. Moreover, one must keep in mind financial allocations outlined in *CFDS* represent government spending *intentions*, and are always subject to change. The reality is that the Navy receives only 17 percent of funds spent, the smallest portion of the total defence budget of the three environments.[201] Combining this reality with the governments' shipbuilding intentions, and the Navy's desire to retain the

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[198]Morse, "Force Development. . .,"2.

[199]Department of National Defence, Capability Investment Database (CID), Project Number 00001336, Canadian Surface Combatant. available from: http://otg-vcd-webs018.ottawa-hull.mil.ca/CID/search_e.asp; Intranet; accessed 16 March 2009.

[200]*CFDS*, Chart 3 Total Defence Spending, See Figure 2.1, page 50.

[201]Eric Lehre, "The Need for Balanced Capabilities," *Canadian Naval Review* Vol. 3 No. 1, (Spring 2007): 2.

broadest range of capabilities, a pragmatic approach suggests that in an increasingly joint operating environment, the Navy work in conjunction with the other CF elements in prioritizing requirements.[202] This imperative may become increasingly important if planned *CFDS* equipment procurements are affected by the current economic recession.

Besides the question of cost for Option One, the suggestion that such a fleet is simply a variation on what currently exists and lacks contemporary thinking merits consideration. The "fourth fleet," with the CSC at its foundation and supported by a modest replenishment ability, meets key elements of the Navy's doctrinal tenets described in *Leadmark*. Versatile in its ability to deploy on a range of missions from maritime interdiction operations (MIO) to ASW and capable of defending not only itself but other members of its group, it provides the basis of the flexible, balanced fleet the Navy has presented to the government and to Canadians. With the MK 41 Vertical Launch System (VLS), phased array radar, modern long range sonar and an embarked Cyclone helicopter(s), it, like its CPF and TRUMP predecessors will be capable of responding to a wide range of potential 21st century maritime security threats. While it presents a multi-role, combatant capable platform it does not offer any new strategic thinking for this century.

Applying this fleet structure against the three main roles for the CF outlined in *CFDS,* initially suggests that Option One could meet both "home" and "away" task

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[202]This is not to suggest that the Navy should base its requirements on expected or anticipated fiscal limits with specified funding envelopes driving assumptions and recommendations. Rather, by working within governmental strategy and political and economic realities the navy can leverage joint relationships and maximize capabilities within resources available. For more on this discussion see Centre for Foreign Policy Studies. *Proceedings of the Maritime Security and Defence Seminar*,"The Canadian Navy and the New Security Agenda." Toronto, 26-27 April 2004.Edited by Ann L Griffiths, Halifax: Dalhousie University, 2004.

requirements.[203] The Canadian Surface Combatant, with it leading edge surveillance systems, sea keeping ability and modern weapons systems could provide both a high level of domain awareness in North American continental waters and be able to respond to crises or threats as required by government strategy.[204] Similarly, a CSC-led task group provides a high degree of operational autonomy and leadership while "away." In fact, *CFDS* points to naval task groups as a specific way to assume leading roles in multi-national operations. In addition, the Navy has an established record of interoperability with the United States (US), based primarily on CPF integration within US Naval carrier task groups. It follows that Option One also meets the Canadian strategic requirement to "Remain interoperable with the US military."[205]

Highlighted by the current fleet's operations with the USN in particular, an Option One-based fleet composition has without question met and exceeded expectations for current naval missions. However, the military, conservative by nature, prefers to follow with a known and operationally tested fleet or weapons system. After some profound doctrinal changes from a force based largely on a Cold-War ASW focus, to one capable of operating independently in a multi-threat environment, the Canadian Navy has become much more adept in operating within a Canadian or US-led task group.[206] Understandably, its selected replacement for the next fleet is one which mirrors the

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[203]The use of the sport lexicon to describe domestic missions (home) and international/deployed (away) has been used previously to broadly delineate potential naval operations See Peter Haydon's "Canada's Navy, A Good, Workable Little Fleet?" *Canadian Naval Review*, Vol 1 No 1, (Spring 2005).

[204]*CFDS*, 7.

[205]*CFDS*, 8.

[206]James Fergusson, "Thoughts From The Outside: Rethinking Maritime Strategy and Force Requirements for 2020," in Edward L. Tummers (ed) *Maritime Security in the Twenty-First Century*. Halifax: Dalhousie Centre for Foreign Policy Studies, Occasional Paper No. 11): 109.

current construct. But it might be worthwhile to heed Admiral Morse's point that such a fleet offers little that is new.

With defending Canada the CFs primary mission, it follows that a 21st century fleet composition should, first and foremost, be balanced in favour of the home game. On the domestic front, technology could address the strategic requirement for seaward surveillance of Canadian approaches through the use of Long Range Surface Wave Radar.[207] When used potentially in conjunction with surveillance aircraft and a more sea- kindly littoral patrol ship than the MCDV, this relatively inexpensive system could assist in providing an enhanced and accurate real-time picture to the newly established Maritime Surveillance and Operations Centres in Halifax and Esquimalt. By continuing to apply land and space-based technological innovations to continental defence, in addition to ship board systems, the number of complex blue water ships necessary to maintain security on the home front could be reduced. In a competitive fiscal environment, this arrangement could free up funds and personnel to man additional, less expensive platforms in a more balanced fleet. The events of 9/11 drove home the fact that the North American continent is vulnerable to attack. This danger is likely to remain a dominant concern through the 21st century and is reflected in the Canadian government's defence priorities. Given the generally accepted assumption, reinforced by the friendly tone of US President Obama's recent visit to Canada that the two countries will maintain collective continental security, a more robust, littoral capable fleet would likely be well received in the US defence community.[208]

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[207]This project has sites established on the Canadian East and West Coasts. It is currently undergoing set to work trials.

Option Two: The Littoral Force

The ability to project leadership overseas is also an important part of the government's defence strategy which affects fleet composition. In considering alternatives to the status quo, it is worthwhile to note that recent international operations in support of Operations Apollo and Enduring Freedom, CTF 150 and the World Food Campaign have all taken place in littoral or coastal waters. As a result of regional instability and a rising number of failed states worldwide, indications are that similar naval operations will occur in the future. Accordingly, James Fergusson argues that the Navy should temper its preference for a blue water fleet and seriously consider "naval platforms that can perform "brown-water" functions."[209] Far from turning the Navy into a domestic coastal constabulary force, the development of a distinct littoral capability could provide Canada with new leadership opportunities on NATO, UN, or coalition based international operations.[210] Based on the government's intentions to build ships, it follows that upcoming ship procurements consider platforms that not only provide such opportunities but can also be built relatively quickly in Canada.

Recent purchases for the Air Force and Army demonstrated that equipment can be obtained for the military expeditiously. It also proved that the current, cumbersome Canada procurement process can be streamlined and responsive to urgent demands. While the CSC has not progressed to a level where a rapid building program

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[208]That Canada will continue to work closely with the US in collective security efforts has underpinned naval planning for the 21st century for some time. In addition to *Leadmark,* see Edward Tummers,' "Maritime Security in the 21st Century: The Changing Maritime Security Environment," in *Maritime Security in the Twenty-First Century*. (Halifax: Dalhousie Centre for Foreign Policy Studies, Occasional Paper No. 11), 87.

[209]Fergusson, "Thoughts From The Outside. . .," 107.

[210]*Ibid.*

parallel is possible, alternatives to Option One have potential to be built from existing designs, thereby expediting the process. For example the USN's Littoral Combat Ship (LCS) or a Canadian AOPS variant, based on the Danish *Thetis* or *Knud Rasmussen* class light frigates or the Norwegian *Nordkapp* offshore patrol vessels, could potentially be constructed in Canadian yards. Besides being able to operate in coastal environments in support of Canadian interests worldwide, such a force might be better suited to maintain and defend Canadian interests in the increasingly navigable Arctic waters. What is more, a coastally oriented naval force structure captures the current Canadian political and public interest in our sovereignty. Given its lower cost and the potential for more of them, this diverse fleet composition merits consideration. As one analyst posited: "There will be another call to look at the feasibility of getting 'smaller and less costly' ships. .. . and we should expect that call to consider Arctic operations."[211]

If blue water navies need to conduct extended operations in the shallow waters of the Arctic Ocean and in the green and brown water littorals elsewhere, their force structure should incorporate ships capable of working in these environments. While the danger inherent of operating large warships in inshore waters has been long recognized in naval doctrine, it took a potentially explosive incident with Iran to underscore the practicality of smaller warship designs.[212] Far removed to the south of Canadian Arctic waters, the March 2007 capture of the naval boarding team from the Royal Navy (RN) frigate, HMS *Cornwall* in the Arabian Sea drew international attention as the UK government lobbied for their release with Iran. Less widely reported was the

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[211]Peter Haydon, "Choosing the Right Fleet Mix. . ."

[212]Ken Hansen, "The Superior-Simple Ship Fleet Construct," *Canadian Naval Review* Vol 3 No. 2, (Summer 2007): 4.

fact that the Type 22 frigate was unable to operate close by her team in the shallow coastal waters adjacent to the Iranian territorial sea. The Arabian Sea and its environs are familiar waters to the Canadian Navy. It is therefore entirely possible that given future deployments to that and other coastal regions of the world, including our own Arctic, Canada could be faced with the need for a ship capable of operating safely and comfortably in the littorals. In fact, the recent Op Nanook series of exercises demonstrated that the Canada's northern waters can impact ship movements. For example, because of the ship's draft in the shallow waters of Frobisher Bay, *HMCS Toronto* was forced to anchor far out from Iqaluit during a visit to the Nunavat capital in August 2008.[213]

A potential fleet comprised of 15-20 patrol ships able to operate close to northern shores or in distant archipelagic waters, as well as 4-6 larger surface combatants and a replenishment capability offers arguably greater flexibility than the fleet it would replace. This fleet could consist as a practical mix of the LCS, of which the first of class, USS *Freedom* was recently commissioned, and the AOPS/Coastal Patrol vessels. If the Canadian design and contract definition can be accelerated through PWGSC and Treasury Board, the latter could be based on what Canadian requirements have developed thus far. As has been recently demonstrated by the swift purchase of the Boeing C177 Globe Masters and of Leopard Tanks, the cumbersome Canadian procurement process can be streamlined when necessary. Alternatively, the coastal patrol could be based on built-in-Canada versions of existing Scandinavian designs. By proceeding with the

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[213]While the MCDVs which have accompanied CPFs on these exercises have greater manoeuverability and shallower drafts, they are limited by their relatively limited communications equipment, seamanship capability and low top speed (15 knots).

AOPS patrol version first, Canada could take advantage of follow on design changes to the LCS currently underway in the US before shifting to building it too in Canada.[214] The underlying point here is that either, or a combination of these vessels could be built much more quickly in Canada based on existing design work than the CSC in Option One.

It is recognized that this is a significant departure from the Navy's preferred "fourth fleet" structure. As such there may be less desire within the naval community to rally around a structure other than a CSC task group.[215] However, as the RN found in the Arabian Sea, a more balanced fleet composition could be better suited to provide the flexibility the Navy is currently seeking through a CSC based task group structure. As Hansen argues, a largely uniform fleet structure based on a single class of ship only works if the strategic environment is relatively stable and threats are known and identified: "If the strategic context is complicated, changing or uncertain, [as the 21st century is likely to remain] a diversified fleet structure is required."[216] Considered from this perspective, there is a valid and practical argument to be made for a larger and more capable littoral fleet component for Canada, and is more representative of the new thinking that Admiral Morse challenged naval planners to address.[217] Furthermore, applying Option Two against the tasks outlined in *CFDS* suggests that this composition could easily meet the governments' three strategic defence tasks.

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[214]For additional information on LCS see Lockheed Martin "Littoral Combat Ship." available from http://www.lmlcsteam.com/team.html ; Internet; accessed 5 April 2009.

[215]Haydon, "Choosing the Right Fleet Mix. . .," 12.

[216]Hansen, "The Superior-Simple Ship Fleet Construct," 4.

[217]This mix would provide the Navy with potentially more ships and more opportunities for command at sea.

The CF's primary task of defending Canada could be addressed by a combined LCS/AOPS option. More ships at sea more frequently, with sea keeping and surveillance capabilities and speed far superior to those in the Navy's current MCDV fleet would provide a flexible and capable presence. Moreover, the government's second strategic requirement, to contribute to the defence of North America –a subset of the defence of Canada - could also be met with a new, 21st century fleet structure. With common equipment, particularly in the case of the LCS, the same levels of interoperability with the USN are possible.

In addition to continental interoperability, the AOPS component of Option Two could give Canada a ship capable not only of operating in first year ice but in the heavy winter seas of the North Atlantic and Pacific oceans. With sea state and slow speeds a limiting factor in the use of the current MCDV fleet, the two ship classes in Option Two could easily correct the current limitation.[218] While recognizing that both LCS, because of its light displacement may be limited to inshore or coastal waters during Canadian winter storms, this limitation would be balanced by its high speed, shallow draft and onboard surveillance capabability. In an increasingly ice free Arctic, LCS could prove to be an excellent consort to AOPS. With speeds approaching 50 knots, it would be able to cover Arctic distances quickly, greatly assisting in the sovereignty enforcement, presence and incident response capabilities of the Navy in Arctic operations.

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[218]Editorial, "Canadian Offshore Patrol Vessels: Further Thoughts," *Canadian Naval Review* Vol 1 No. 4, (Winter 2006): 2.

Figure 3.1: Less is More?The AOPS[219]

Besides having to expedite the ships' concept of operations, an accelerated Option Two building program might compel the Navy to revisit and refocus its own plans for the Arctic. Long predicted to assume a far more significant role in Canadian defence policy, naval doctrine for the 21st century must accordingly address the Navy's strategy for the North.[220] As Scott Bishop argues convincingly in a recent essay on the subject, the Arctic has received only cursory treatment in *Leadmark* and its follow-on, *Charting the Course from Leadmark.* [221] With the Arctic's increasing importance in terms of sovereignty, defence and resources, particularly under the current government, an Option Two fleet could form a vital part of this and could give the Navy a greater leadership role in northern operations for the Canadian government.

Examining Option Two from the governments' third task, contributing to missions abroad, also illustrates the potential of littoral and coastal vessels. Although

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[219]Scott Bishop, Northern Strategy Deficit: What to do with the Arctic Offshore Patrol Ships? *Canadian Naval Review* Vol 4 No 3, (Fall 2008): 11.

[220]Writing in 1988, Harriet Critchley argued that the Navy must consider its role in Arctic operations and outlined a number of approaches to do so. See Harriet Critchley, "Canadian Naval Responsibilities in the Arctic," in W.A.B. Douglas (ed). *The RCN in Transition*: 1910-1985, 291.

[221]Scott Bishop, "Northern Strategy Deficit: What to do with the Arctic Offshore Patrol Ships?" *Canadian Naval Review* Vol 4 No 3, (Fall 2008): 11.

their roles are more constabulary in nature, by additional quantity alone Canada could point to LCS/AOPS as its contribution to the US vision of a "1000 ship" coalition –based Navy.[222] With more ships available, and with a CSC, or another coalition nation's larger surface combatant acting as the command and control platform, this brown water option could act as a force multiplier. The fact that Denmark's *Thetis* light frigates have "performed well in coalition operations with an augmented crew and additional communications," suggests that a Canadian AOPS could contribute equally to overseas missions.[223] With fewer personnel required, a mission specific payload and speeds comparable or better than CPF/TRUMP or CSC, LCS is well suited to MIO, counter narcotic, high value escort and inshore surveillance work. With its greater seakeeping ability but slower speeds, AOPS also has a role in presence, embargo, escort and sea control missions, albeit with a quarter of the crew required in CSC.

In addition to their primary roles at home and secondary missions abroad, both LCS and AOPS could be used in areas where the government wishes to contribute to a naval presence but may not wish or be able to commit a more substantial or visible contribution.[224] In areas of increased threat or times of increased tension, these smaller fully armed vessels would require the presence of a superior ship to provide force

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[222]The current US Chief of Naval Operations, Admiral Gary Roughhead, and his predecessor, Adm Mike Mullen (now Chairman of the Joint Chiefs of Staff) address frequently the US Global Maritime Strategy of the "1000 Ship Navy." The concept is based on a fleet-in-being partnership of like minded nations focused on maritime stability. Multi-national exercises like Rim of the Pacific (of which Canada is a key participant) are intended to strengthen these partnerships. See Christopher P. Cavas, "The Thousand Ship Navy." *Armed Forces Journal* Vol. 12 No. 12 (December 2006) [journal on line]: available from http://www.armedforcesjournal.com/2006 /12/2336959; Internet; accessed 21 April 2009.

[223]Doug Thomas, "Warship Developments: Those Innovative Danes!" *Canadian Naval Review* Vol 4 no.1, (Spring 2008):41.

[224]For example, the Joint Interagency Task Force South (JIATF) which conducts counter-drug operations in the Caribbean Sea, Central America and the Western Pacific littorals.

defence. However, arguments suggesting that their overall utility is any less are countered by the point that ". . .these ships make it possible to operate in areas and in ways that are both inappropriate and unsuitable for superior ships."[225] Given a strategic requirement to patrol Canada's three oceans, combined with HMS *Cornwall's* experience in the Arabian Gulf and HMCS *Winnipeg's* recent anti-piracy operations in the Horn of Africa, a fleet balance in favour of a littoral capability merits continued consideration.

Figure 3.2: LCS: The Potential Second Half of the Littoral Option[226]

Considering the government policy to build in Canada, combined with a need to act quickly on a favourable political climate and the economics of federal fiscal stimulus, Option Two could provide the Navy with a quick start to a new and innovative fleet composition. What is more, the size and design of the AOPS in particular are comfortably within the capability of the six existing Canadian Shipyards to produce.[227]

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[225]Hansen, "The Superior-Simple . . .,"7.

[226]Lockheed Martin Shipbuilding,"Littoral Combat Ship,"available from http://www.lmlcsteam.com/photo_gallery/sea_trials/index.html; Internet; accessed 5 April 2009.

[227]While the author recognizes that negotiation for design, intellectual property rights and foreign military sales would be required with the US and possibly, Scandinavian, governments, such an effort

Expertise might have to be recruited from abroad, but with an excess of capacity worldwide, and a growing pool of skilled unemployed Canadians, it would be possible for the domestic industry to one again coalesce around a project. With the project office already stood up, and the statement of requirements (SOR) complete, a concerted effort to move the project rapidly, akin to that for the other elements' recent equipment purchases would get shipyards working and the Navy on its way to receiving a functional solution to meeting part of its *CFDS* requirements.[228] What is more, the relatively low cost per platform would make it less visible to being caught in the winds of political change. That is to say that it might stay below the government's radar if subsequent defence reductions are required. As was demonstrated by the Chretien Liberals in the EH 101 debacle, a project approved is not necessarily a project assured of completion.[229]

Besides providing the Navy with a cost and personnel effective solution to its domestic maritime surveillance and patrol tasks, the scale of an expedited AOPS building program would also lead comfortably into construction of other federal shipbuilding requirements: For example, half of the Coast Guard's fleet of large vessels has been in service for over 25 years and the Department of Fisheries and Oceans requires replacements for an aging fleet soon.[230] Accordingly a building program focused on

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could contribute to an expedited construction program in Canada. Obviously, this would also involve a rapid streamlining of the Canadian procurement process.

[228]In the case of AOPS, this would not necessarily mean a sole-source acquisition as in the C-177 Globemaster but rather an opportunity for Canadian industry to produce design and contract offers. If they proved unable to produce a viable Canadian design, the government could then go to Norway or Denmark to purchase and build their design under license in Canada. With that work underway, arrangements could then be made to build LCS under license in Canada. For more recommendations on improving the CF equipment acquisition process see Bowering, "Military/Naval Procurement in Canada: A Flawed Process."

[229]Lieutenant Commander M.T.J. Kurtz, "Policy, Transformation and Shipbuilding: The Perfect Storm Threatening the Future of Canada's Surface Combatant Fleet," (Toronto: Canadian Forces College, Master of Defence Studies Research Paper,2007): 35.

smaller warships would also lend itself to ramping up production capacity to lead potentially to a steady state construction program in the shipbuilding industry.

At a considerably lower per unit cost to build and fit out than either the CSC or JSS, significant economies of scale are possible under Option Two. With LCS at approximately $350 million US per ship[231] and AOPS estimated at $500 million (CDN)[232] per platform, the Navy could build 20 ships for almost one third the cost of the CSC program CSC or 4-5 ships under Option Two for the cost of a single JSS. Moreover, at a time when trained sailors are at a premium, Option Two would give the Navy additional manning flexibility in getting ships to sea. The USN concept of operations for LCS calls for a core crew of about 40 which could expand to 70 depending on its mission.[233] Initial concept development on AOPS suggests a core crew size of approximately 45[234] Once on station, the AOPS could be operated at far less cost for sea day than an FFH/DDG or, eventually the CSC, but is capable of providing superior coverage in both coastal and offshore waters. In doing so, the littoral option would have

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[230]Canada, Fisheries and Oceans, *Canadian Coast Guard Fleet Annual Report 2006-2007*, 15.The 2009 Federal Budget allocated 175 million for Coast Guard replacements and refits. In doing so, the government sought "to increase activity in the sector by allocating funds to speed-up needed procurement."

[231]Doug Thomas, "Warship Concepts, The Littoral Combat Ship," *Canadian Naval Review* Vol 2 No. 4, *(Winter 2007)*: 35.

[232]Department of National Defence, Capability Investment Database (CID), Project Number 00001216, Arctic Offshore Patrol Ship. available from: http://otg-vcd-webs018.ottawa-hull.mil.ca/CID/search_e.asp; accessed 18 March 2008. Note that the project includes a deep water jetty and associated infrastructure in Nanisivik, Nunavut and is included in my figure of 500 million/ship Based on 8 ships, this puts the platform cost in line with the LCS' cost per platform.

[233]Doug Thomas, "Warship Concepts, The Littoral Combat Ship," 35.

[234]The AOPS Statement of Operational Requirement calls for a core crew size of approximately 35-45. The SOR notes that the crew size will be refined during the Options Analysis and Definition phase. The SOR crew estimate is comparable to the Scandinavian patrol vessels. See Statement of Operational Requirement Arctic Offshore Patrol Ship (AOPS). Chief of Maritime Staff 12 May 2008.

greater capacity "to exercise control over and defend Canada's sovereignty …", required by government strategy.[235]

Option Two's ability to respond to missions in support of Canadian sovereignty could be assisted thanks to the inherent flexibility of modularized mission fits and interchangeable payloads. In this way, the LCS can quickly adapt from one warfare task to another. While the costs and numbers of specific warfighting models would have to be resolved within any procurement process, mission adaptability would save money by avoiding the installation of unnecessary sensors and weapons. [236] Similarly, Denmark's inclusion of containerized missile, weapons and sensors systems for its *Knud Rasmussen* class suggests Canada could develop a similar capability for its AOPS.[237] The accompaniment of a helicopter with either AOPS or LCS would multiply the surveillance area, contribute to maritime search and rescue and provide the same level of versatility and flexibility that it would if embarked in a larger warship. With the requirement to land, launch and house the Cyclone helicopter, and an ability to land and refuel the Cormorant both detailed in the SOR, Option Two has the ability to be a significant force multiplier and enabler for the CF in Northern joint operations.

While construction, design and a potential new concept of operations need to be developed, Option Two with a potential mix of LCS and AOPS extends the shipbuilding question beyond simply a blue water fleet with a domestic coastal capability, to a balanced fleet based on littoral operations. While there are drawbacks in weapons

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[235]*CFDS,* 8.

[236]Doug Thomas, "Warship Concepts. . .," 37.

[237]*Ibid.,* 38.

systems, smaller crew sizes and endurance, they represent an innovative option for the Canadian Navy as it prepares to celebrate its first century of service. As Doug Thomas describes, "These very flexible vessels would also contribute greatly to the security of our national maritime borders – when not deployed abroad to tomorrow's peace support and coalition operations."[238] While there should be no doubt that an eventual replacement for TRUMP and post HCM CPFs will play a contributing, superior ship role, this balanced construct has the potential to build more ships, for less money, more quickly –something that will appeal to Canadians and to the Canadian government.

Option Three: An expanded JSS Fleet

Perhaps not as appealing to Canadians as it was to the defence industry, DND and Canadian shipbuilders, was the recently cancelled JSS. With an ability to transport a vanguard battle group and support coalition and joint operations ashore, it was described as a transformational joint strategic project for the CF. However, the incremental costs of delivering this joint capability, combined with rising commodity, labour and associated costs exceeded the authorized capital costs for the project and made it financially unviable for the industry consortiums to proceed. Using JSS as an example, it would appear, for the time being that even the "transformational" and "joint" functionality of these vessels was not enough for the government to assume the monetary risk necessary to make bidding on the project financially viable to the defence contractors and shipbuilders affected. Yet, despite initial problems regarding cost, the government recognizes the importance of the project and has stated its intention to proceed with a

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[238] *Ibid.,* 38.

revised version of the ship. With this in mind, the following considers another option: the Navy reducing or eliminating its CSC proposal, remaining with the currently planned 6-8 AOPS, and focusing its next fleet around 8 JSS.

Such a fleet proposal is not without precedent. Writing in 2000, Gimblett proposed that the government's foreign policy could be best addressed by a 'transformational' fleet balanced around the Afloat Logistics and Sealift Capability (ALSC).[239] As in Gimblett's ALSC proposal, a JSS based fleet would be a profound change from the Navy's current preferences. This proposal exceeds the 3 ships intended under the existing proposal in deliberating building a fleet around JSS. Such a move would require considerable doctrinal and professional shift from a multi-purpose task group, based on command and control resident in a flag ship destroyer, to executing a similar function from within a multi-purpose support and replenishment platform. As the CPF is withdrawn from service in the late 2020 timeframe, it follows that Canada would be necessarily more reliant on the USN and other allies to defend the ships. Given its combined naval replenishment and joint transport functions, JSS would make an attractive high value (HVU) target to a potential foe and, like any HVU, would require considerable protection.[240] However, an expanded JSS program has the potential to provide work to the industry, political mileage for the government and an innovative capability for the Navy.

Based on the argument that the government has traditionally used the shipbuilding industry to contribute to economic development, regional stability as well as a modest

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[239]Gimblett, "A 'Transformational' Fleet for Canada in The 21st Century," 45.

[240]David Overall, "The Joint Support Ship: A Worthy Goal or Doomed Investment*?" Canadian Naval Review* Vol 2 No 4, (Winter 2007) 28.

naval fleet, JSS has an advantage in that it has progressed further than any of the three options proposed. If the project can be reconstituted quickly and set back to its original schedule, the first ship could be delivered by 2012, a full two years prior to the initial operation of the first AOPS.[241] From a domestic shipbuilding perspective, the Canadian Shipbuilding Association (SAC) acknowledged that JSS will challenge the existing capabilities of Canadian yards. As noted previously, considerable infrastructure and human resource investment will be required to support JSS construction in Canada. However, the SAC has also stated that it is ready, as it is has been in the past, to meet these challenges and build JSS.[242] Moreover, it is encouraging to note that the industry complied with governmental intent and policy during the contract definition phase.

Money, it would appear, is still the most contentious issue affecting the currently proposed project. As a result of mounting government debt, a shrinking national economy and growing numbers of industries and businesses looking for government aid, it is likely that money will be an issue for all new shipbuilding projects. Consequently it is not surprising that the location of ship construction will be a key public concern. In this context, Option Two has an advantage in that it is not only less expensive but it also would permit the government to share the work among yards on both coasts, Quebec and potentially even Ontario.[243] However both SNC and ThyssenKrupp noted that their JSS

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[241]Department of National Defence, Capability Investment Database (CID), Project Number 00002673, Joint Support Ship. available from http://otg-vcd-webs018.ottawa-hull.mil.ca/CID/search_e.asp Accessed 18 March 2008; DND Intranet; accessed 18 March 2009. These dates presume that AOPS is procured in accordance with existing milestones.

[242]Peter Cairns, "Shipbuilding and Industrial Preparedness," 21.

[243]This idea is derived Middlemiss, Economic Considerations . . .,"

proposals would create economic spinoffs benefitting the entire country.[244] The CPF/TRUMP shipbuilding projects nonetheless illustrate that the optics of geography in IRB application have historically been focused around the actual shipyards doing the work.

With funding an issue, the Navy can nonetheless still take advantage of a sympathetic government by compromising its Option One, CSC aspirations, in favour of an expanded JSS fleet. By taking its ambitious, and as of yet unfunded, $26 billion proposed CSC off the table, the Navy could make a strong case for additional JSS platforms from its share of new equipment funding in *CFDS.* In a competitive procurement environment, this action might allow the Navy to seek the additional incremental dollars necessary to build JSS in its current form. This would, in turn, permit the Navy to point to this transformative project as its contribution to a joint force capability. The challenge for JSS as a sustainable shipbuilding project is that if the Navy bases its fleet on a ship with a potential capital cost of almost a billion dollars each, it may prove easier for the government to whittle down production if subsequent cuts to defence spending are required. For this reason alone, a JSS-based fleet carries a considerable risk if the political winds change.

Recognizing that a JSS option carries monetary and political risk, it does meet a number of the government's strategic military tasks under *CFDS.* For example, JSS could help fulfill a force multiplication role in responding to domestic emergencies.[245] Other possible domestic tasks include major earthquake in British Columbia, and a

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[244]Peter Diekmeyer, "Replacing the AORs," *Canadian Defence Review*, (December 2007) 40.

[245]*CFDS.*

seaborne terrorist attack in a major port city. In these scenarios, and in foreign emergencies, such as Hurricane Katrina, the JSS would prove indispensable in providing a coordinated response.[246] As in Option Two's littoral based fleet, a fleet using JSS could be a source of pride and give Canadians a reassuring sense of preparedness. With increased emphasis by the government and media on emergency planning, JSS with its embarked helicopters, roll-on, roll-off capability and an extensive medical facility could comprise a fundamental element of *Canada Command's* response to a domestic crisis. From a continental perspective, Option Three would allow the Canadian Navy to continue to integrate with the USN. By providing sustainment, rather than by replacing a USN destroyer or frigate within a carrier battle group, the Canadian Navy could make an greater contribution to US/Canadian defence. *HMCS Protecteur's* assumption of duties as the Hawaiian-based, Mid-Pacific Oiler replacing a USN ship in this role, illustrates an ongoing need for sustainment assistance, even in the large US fleet.

Regarding *CFDS's* strategy of projecting leadership abroad, a strong argument can be made for the JSS' sustainment and command and control role in deployed operations. JSS could host a joint command centre for coalition or independent missions, thanks to its accommodation and communications capacity for a joint headquarters. In its sustainment role, a fleet with several JSS could allow Canada to act concurrently as a force multiplier on not one, but several deployed operations. As observed in multi-national exercises, recent NATO meetings and in Canada's own operations in Afghanistan, fleet sustainment and sea lift capacity is at a premium. As David Overall points out, the development of this capacity would be of ". . .great interest to the

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[246]Overall, "The Joint Support Ship. . .," 28.

alliance." [247] This interest suggests an increased demand for Canadian naval contributions to worldwide operations and an associated increase in coalition leadership opportunities under a JSS fleet construct.

A Challenging Balance

Several possibilities for a renewed Canadian built fleet highlight the domestic building imperative and the many factors that affect government decision-making. With the objective of building warships that can weather political and economic uncertainties, be built in Canada and meet strategic defence requirements, the three fleet options, summarized in Table 3.1, demonstrate the complexity of this task. Recognizing that all three address elements of the government's defence intentions, the overriding consideration becomes one of championing a fleet composition which meets pragmatically Canadian monetary, political, industrial and geostrategic realities.

As the Navy's preferred follow- on to the proven ability of the current CPF/TRUMP fleet composition, the CSC replaces a command and control capability in the current Cold-War legacy fleet. This construct does not look significantly different from the current fleet nor does it add any substantial new (non-technical) capabilities for the complex range of domestic and international missions that might be required in the 21st Century. While an argument can be made that the status quo has served the country well, it does not provide a more balanced force for working in the littorals nor does it allow for the development of new expertise in a specific area within NATO, the USN or

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[247] *Ibid.*

coalition-led operations. Moreover, projected at $26 billion, the CSC is too expensive and perhaps more than the government is willing to pay.

As an alternative, an expanded JSS based fleet composition in Option Three brings a truly transformational and joint capability to the CF. It offers considerable domestic emergency response capability as well as a range of international leadership and coalition contribution options for the government. Even at 6-8 ships, JSS is also less expensive overall than the proposed 15-18 CSC project. Least expensive, Option Two consists of a littoral-centric fleet, based around a combination of 15-20 LCS and AOPS platforms. More easily achieved with domestic shipbuilding capability, this fleet could provide the best range of presence and sovereignty capability at home and new leadership and maritime engagement activities abroad at a reasonable cost. Based on a correlation of these factors, the littoral force presents a pragmatic fleet mix option. Perhaps more importantly, it is, by numbers and capability alone, the most reflective of the current government's emphasis on defending Canada and the North American continent. Option Two has much to commend it.

21st Century Fleet Composition Options Summary

	Build in Canada	Number of Ships	Advantages	Shortcomings	Remarks
Option 1: CSC/Task Group	Yes	15-18	1. Proven capability in current fleet mix 2. Naval experience and doctrine based on multi-role and multi-threat platform 3. Cornerstone of continuous building strategy	1. The most expensive option. 2. Construction not due to commence until 2017. Easily subject to cancellation by subsequent less pro-defence governments 3. Competition among elements for *CFDS* funding..	1. DND/Navy preferred fleet composition. 2. Long production and building process may not meet political and economic effects desired by current government. 3. Shipyard infrastructure funding required (depending on sequence of building)
Option 2: Expanded Littoral	Yes	AOPS LCS Mix	1. Less expensive could result in more ships. 2. Meets *CFDS* missions for Canada/North America 3. Increased presence in Arctic. 4. Allows for development of a coastal/inshore specialty on deployed operations.	1. Smaller, less capable in multi-threat warfare 2. Canadian design (or modifications to existing required) to operate in Canadian ocean environments 3. US LCS still undergoing post acceptance trials	1. Expected to move to contract definition phase Fall 2009 2. Ability to leverage existing designs for AOPS and USN LCS. 3. For shipbuilders/ defence industry, potentially the least complex vessel to build using existing infrastructure 4. May be most attractive to government based on affordability and time to production.
Option 3: Expanded JSS	Yes	6-8	1. Joint Capability 2. Decreased reliance on commercial transportation for CF equipment. 3. Project length and progression.	1. First of a kind, no shipbuilding experience to draw upon 2.Higher degree of risk for all involved (particularly for industry under current risk management policy)	1. Complex to build. 2. Navy requires new replenishment ships soon 3. Challenge of allocating and prioritizing missions between all CF elements. 4. As per Option One, shipyard infrastructure required.

CONCLUSIONS

Government interest and involvement in Canadian shipbuilding is borne out by the historical record. Starting with the CMCs division of *St. Laurent* construction to yards across the country, deliberate federal intent to support the industry, distribute shipbuilding work and allocate government procurement dollars was evident throughout this period. Despite the demise of the CMC and an overall reduction in the industry through the 1960s, governments continued to leverage shipbuilding's economic spinoffs for political advantage. Pressure exerted from the industry on the federal government led to top down direction for naval planners to present projects like the GPF and the DDH 280, for the Canadian industry to build. Later, regional and political angst in Quebec over the awarding of the CPF contract to SJSL resulted in Davie building three of the CPFs. Further evidence of political interest and government involvement in Canadian shipbuilding was evident when Davie was granted the TRUMP conversion contract. Besides illustrating government interest in warship construction programmes, Canada's track record offers many illustrative lessons to inform discussion on future building programmes.

Demonstrated to the extreme in the DDH 280 project is the need for clarity and intent in project design and requirement. Incremental changes to a ship after project approval can lead to excessive costs, delays in completion and an overall sense of mistrust amongst the industry, government and DND. To this end, it is important that all work from the same approved design and not attempt to make successive changes after the fact. Starting with the St. Laurent project, Canadian warship construction over the

last 60 years showed that design, construction and delivery delays were common. This suggests that sufficient flexibility in operations and training schedules is required for all future programmes. So that the ship can clear the political and economic hurdles of the procurement process, it is essential that there is agreement, discipline and clarity of vision within the Navy and the DND before the project even commences. Approved but never built, the GPF was cancelled, in part because competing factions within the Navy could not agree on a unified vision for the fleet. While doctrinal unity is not an issue now, the GPF project points to the need to maintain cohesion if changes to fleet composition are necessary in the future. Finally, past programmes suggest that projects need personnel stability and consistency. Frequent turnover of project personnel adds to project delays through the time required for job familiarization and differing priorities of effort.

Besides the time necessary for DND to establish and populate project offices, the cyclical reality of federal shipbuilding requires time for shipyards to prepare for construction. An overview of current capacity indicates that Canada's relatively small shipbuilding industry shows that it has developed niche capabilities in certain sectors but almost 15 years have passed since it has built a warship. This fact, combined with the 2003 dismantling of the SJSL yard, point to the industry's current shortage of capability and capacity to embark quickly on naval building programmes. To address this issue, the shipbuilding industry, with support from the Navy, has proposed a continuous build model. Such a plan would provide for a deliberate and predictable pace of ship construction over the long term. Logical and sustainable, this plan however requires a significant departure from current policy and past tradition which is simply that the government will build in Canada despite the additional cost when necessary and

expedient. To date, even the more sympathetic Conservative government has neither addressed nor officially endorsed a steady state plan. Given Canada's political system, it is hard get governments to commit to anything beyond the term of their current mandates, a situation exacerbated in a minority parliament. Regardless of the party in power, politicians may prove reluctant to consider a policy change since it could reduce their flexibility in delivering IRBs and tie their hands to a long term spending commitment.

Potential aversion to a long term building plan does not mean that governments have been unwilling to spend. In fact, shipbuilding programmes must possess potential political benefits. For this reason, governments have been willing to embark on shipbuilding programmes even in times of economic uncertainty. With the CPF project as a prime example, shipbuilding delivered jobs and a measure of economic stimulus to regions hard hit by the recession of the early 1980s. However, it also showed that competing demands for government spending meant there was a definite limit to shipbuilding funding and the defence department's plan for a third batch of ships was curtailed based on the costs of the first. This suggests that even in the current economic downturn, with frequent calls for federal spending, that limits to the government's ability and willingness to fund shipbuilding programmes will always remain.

Considering this potential caveat in the current context suggests that even the seemingly pro-defence Conservative government may be constrained by the Canadian economic and political landscape. Notwithstanding that the *CFDS* and a series of recent announcements affirm government commitment to recapitalize the Canadian Navy for the 21st century, affordability, sustainment and politics could once again come to the fore. Indeed the vision for the future naval fleet prevalent within the Navy and DND circles,

may be derailed if the economy does not return to growth as quickly as some economists, politicians and the Bank of Canada have predicted. Accordingly, the current minority government may seek to shore up support, especially in Quebec, Atlantic Canada and urban ridings in BC by expediting affordable shipbuilding programmes for the Navy and other federal government departments in the short term.

In light of such a possibility, the three options presented could inform any decision by the Navy to take advantage of the current political climate and government defence priorities. Starting with the CSC project, the three fleet mix options posited considered the Navy's ability to deliver affordable strategic effect against the tasks articulated by the government in *CFDS*. Given the need for a pragmatic approach, the CSC is a tremendously expensive proposition. Even if the current government were to eventually obtain a majority, CSC may not survive in light of equipment requirements for the Army and Air Force. An expanded JSS fleet is an alternative approach. Innovative and potentially popular with Canada's allies, JSS has progressed to contract definition. However, like the CSC, it carries a high cost per platform which could make vulnerable to cuts under future governments. [248] With the GPF and EH101 helicopter as examples where Conservative approved programs were cut by subsequent Liberal governments, such a possibility cannot be discounted. Finally, an expanded littoral fleet, based on AOPS and potentially, the USN's LCS, could very well represent the best way to recapitalize the Navy if cost, capability, industry capacity and politics are all taken into account.

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[248] As discussed, the author is not suggesting that the AORs not be replaced, simply that DND may need to revert to a less complex and expensive AOR replacement project.

Reflecting the government's priority for continental defence and its associated interest in the Canadian Arctic, a littoral focused fleet presents a cost effective, domestic shipbuilding program. Acknowledging that it would depart from the Navy's current shipbuilding course, it presents an innovative way to meet defence tasks both in Canada and on international operations as required in *CFDS*. More modest in scope and more reflective of Abbot's vision for a post-war RCN based on a "workable, little fleet," the AOPS/LCS-based littoral option represents the most expeditious and pragmatic way to address the Canadian shipbuilding reality.

Even as an interim fleet for this geopolitically and economically unstable time, the littoral fleet's smaller size and reduced platform cost provide political flexibility at home. With the need for federal stimulus and IRBs prominent in politicians' minds, the littoral fleet may not require as substantial a shipyard preparation phase and work may be able to start quickly. Accordingly, there will no doubt be some perceived political advantage for the government in undertaking such a build. Capable of operations in coastal waters overseas, it also presents a more domestically relevant fleet structure that is likely to resonate with politicians and Canadians alike. Following the adage that the "best fleet is the one which gets built," and with the Navy preparing to celebrate its centennial in 2010, the announcement of such a fleet may be well timed to take advantage of Canadians' renewed interest in their Navy.

BIBLIOGRAPHY

Journal Articles

Archer, LCdr R.F. "The Canadian Patrol Frigate." *Canadian Defence Quarterly* Vol. 14 No. 2, (Autumn 1984): 13-21.

Attariwala, Joetey. "The JSS Program." *Canadian Defence Review* Vol. 12 Issue 4, (Fall 2006) 20-27.

Bishop, Scott. "Northern Strategy Deficit: What to do with the Arctic Offshore Patrol Ships? *Canadian Naval Review* Vol. 4 No. 3, (Fall 2008): 3-11.

Cairns, Vice Admiral (Ret'd) Peter. "Shipbuilding and Industrial Preparedness." *Canadian Naval Review* Vol. 2 No. 3, (Fall 2006): 16-23.

Cavas, Christopher P. "The Thousand Ship Navy." *Armed Forces Journal* Vol. 12 No. 12 (December 2006) Journal on line: available from http://www.armedforcesjournal.com/2006/12/2336959; Internet; accessed 21 April 2009.

Curran, Ty. "The Single Shipbuilding Entity Model in Canadian Naval Procurement: A Discussion Paper on Naval Contracts in Canada." *Journal of Military and Stategic Studies* Vol 8. No 3. (Spring, 2006,) Journal on line: available from http://www.jmss.org/2006/2006spring/index2.htm; Internet; accessed 18 March 2009.

Davis, Rear-Admiral (Ret'd) S. Mathwin. "Cancellation of the General Purpose Frigate: Lessons from a Quarter Century Ago." *Canadian Defence Quarterly* Vol. 12 No.2, (June 1990): 61-70.

Davis, S. Mathwin "The Defence Supply Naval Shipbuilding Panel, 1955-1965." *The Northern Mariner* 2, no 4 (October 1992) Journal on line; available from http://www.cnrs-scrn.org /northern_mariner/index_vol_2.html; Internet; accessed 18 December 2008

Diekmeyer, Peter. "Replacing the AORs." *Canadian Defence Review* Vol 12, (December 2007), 40-43.

Editorial. "The Naval Procurement Predicament." *Canadian Naval Review* Vol.1 No.2, (Summer 2006): 2-3.

Editorial. "Canadian Offshore Patrol Vessels: Further Thoughts." *Canadian Naval Review* Vol. 1, No. 4, (Winter 2006): 2.

Friedman, Norman. "Transformation and Technology for Medium Power Navies." *Canadian Naval Review* Vol. 2 No. 2, (Summer 2006): 10-15.

Gimblett, LCdr Richard. "A 'Transformational' Fleet for Canada in The 21st Century." *Maritime Affairs* (Spring/Summer 2000): 42-46.

Hansen, Ken. "The Superior-Simple Ship Fleet Construct," *Canadian Naval Review* Vol 3 No. 2, (Summer 2007): 4-7.

Haydon, Peter T. "Building the Next Fleet: A Discussion with Commodore Kelly Williams." *Canadian Naval Review* Vol. 4 No.1, (Spring 2008): 18-20.

Haydon, Peter T. "Canada's Navy, A Good, Workable Little Fleet?" *Canadian Naval Review* Vol.1 No. 1, (Spring 2005): 11-17.

Haydon, Peter. "Choosing the Right Fleet Mix: Lessons From The Canadian Patrol Frigate Selection Process." *Canadian Military Journal* Vol. 9 No.1, (Spring 2008) [journal on-line]; available from http://www.journal.forces.gc.ca/vo9/no1/index-eng.asp; Internet; accessed 15 January 2009.

Haydon, Peter. "Shipbuilding: An Infrastructure Initiative the Make Strategic Sense as Well." *Canadian Naval Review* Vol. 4 No. 4, (Winter 2009): 34-36.

Hennessey, Michael A. "Canadian Shipbuilding: Some Lessons Observed, if Not Learned." *Canadian Naval Review* Vol. 4 No. 3, (Fall 2008): 23-26.

Hobson, Sharon, "Plain Talk." *Canadian Naval Review* Vol.1 No.4, (Winter 2006): 28-29.

Hobson, Sharon."Plain Talk: Should the Support Ship Sink?" *Canadian Naval Review* Vol 4 No 3, (Fall 2008): 37-38.

Lehre, Eric. "The Need for Balanced Capabilities." *Canadian Naval Review* Vol 3 No. 1, (Spring 2007): 2-3.

Mayne, Richard. "Its Own Worst Enemy: Ship Advocacy in the RCN, 1963-1964, *Canadian Naval Review* Vol. 2 No.3, (Fall 2006): 24-28.

Morse, Rear Admiral (Ret'd) David. "Force Development: A Demand Well Beyond 2015." *Canadian Naval Review* Vol. 4 No. 1, (Spring 2008): 2-3.

Overall, David. "The Joint Support Ship: A Worthy Goal or Doomed Investment*?"* *Canadian Naval Review* Vol. 2 No. 4, (Winter 2007): 28-29.

Stone, J. Craig and Binyam Solomon. "Canadian Defence Policy and Spending." *Defence and Peace Economics* Vol. 16 No. 3, (June 2005) 145-169.

Thomas, Doug "Warship Concepts, The Littoral Combat Ship," *Canadian Naval Review* Vol. 2 No. 4, *(*Winter 2007*)*: 35.

Thomas, Doug. "Warship Developments: To Buy or Lease?" *Canadian Naval Review* Vol. 4 No. 2, (Summer 2008): 39-40.

Thomas, Doug."Warship Developments: Those Innovative Danes!" *Canadian Naval Review* Vol 4 No.1, (Spring 2008):41.

Thomas, Robert H. "Comments on Shipbuilding and Industrial Preparedness." *Canadian Naval Review* Vol 3 No. 1, (Spring 2007): 30.

Thorsteinson, Janet. "A Managed Approach to Fleet Acquisition." *Canadian Naval Review* Vol 4 No 2, (Summer 2008): 29

Thorsteinson, Janet. "A Second Sector, Marine Defence Industries." *Canadian Naval Review* Vol. 4, No. 4, (Winter 2009): 30-32.

Trim, Commander Larry, Lieutenant Commander Paul Forget and Lieutenant Commander David Kazmirchuk. "The Canadian Navy in 2007: An Overview and a Look Ahead." *Canadian Naval Review* Vol. 4 No.1, (Spring 2008): 21-27.

Webb, Roland. "Burrard Drydock Co. Ltd.: The Rise and Demise of Vancouver's Biggest Shipyard." *The Northern Mariner* Vol 6 No 3, (March1996). Journal on line; available from http://www.cnrs-crn.org/northern_mariner/vol06/tnm_6_3_1-10.pdf; Internet; accessed 18 December 2008.

Woodard, Joe. "Canada's Future Naval Fleet: The High Tech Imperative." *Canadian Defence Review* Vol. 12 Issue 4, (Fall 2006) 6-12.

Young, Michael. "No, That Wasn't How We Really Got Here,"*Canadian Naval Review* Vol 2 No.2, (Summer 2006): 30-31.

Books/Academic Theses

Arsenault, J.W. "The DDH 280 Program: A Case Study of Governmental Expenditure Decision Making." In *Canada's Defence Industrial Base,* edited by David G. Haglund, 118-136. Kingston: Frye and Company, 1988.

Bercuson, David. *True Patriot: The Life of Brooke Claxton.* Toronto: University of Toronto Press, 1993.

Centre for Foreign Policy Studies. *Proceedings of the Maritime Security and Defence Seminar*. "The Canadian Navy and the New Security Agenda." Toronto, 26-27 April 2004.Edited by Ann L Griffiths, Halifax: Dalhousie University, 2004.

Critchley, Harriet. "Canadian Naval Responsibilities in the Arctic." In *The RCN in Transition: 1910-1985,* edited by W.A.B. Douglas, 187-208. Vancouver: University of British Columbia Press, 1988.

Davis, S. Mathwin. "Naval Procurement, 1950 to 1965." In *Canada's Defence Industrial Base*, edited by. David G. Haglund, 97-117. Kingston: Frye and Company, 1988.

Davis, S. Mathwin. "The St. Laurent Decision, Genesis of a Canadian Fleet," In *The RCN in Transition: 1910-1985,* edited by W.A.B. Douglas, 187-208. Vancouver: University of British Columbia Press, 1988.

Douglas, W.A.B. Editor, *The RCN in Transition: 1910-1985.* Vancouver: University of British Columbia Press, 1988.

Fergusson, James. "Thoughts From the Outside: Rethinking Martime Strategy and Force Requirements for 2020." *In Maritime Security in the Twenty-First Century.* Halifax: Dalhousie Centre for Foreign Policy Studies, Occasional Paper No. 11, edited by Edward L. Tummers, 101-116. Halifax: Dalhousie University, 2000.

Hadley, ML, Huebert R. and Crickard F.W. *A Nations Navy: In Quest of Canadian Naval Identity.*. Kingston: McGill-Queen's Press, 1996.

Haydon, Peter. "Sailors, Admirals and Politicians: The Search for Identity after the War." *A Nations Navy: In Quest of Canadian Naval Identity,* edited by Michael L. Hadley, Rob Huebert and Fred W. Crickard, 221-138. Kingston: McGill-Queen's Press, 1996.

Hennessey, Michael A. "The Rise and Fall of a Canadian Maritime Policy: A Study of Industry Navalism and the State," PhD Thesis, University of New Brunswick: 1995.

Lane, Frederick. *Ships for Victory: A History of Shipbuilding Under the US Maritime Commission in WWII.* Baltimore: Johns Hopkins University Press, 2001.

Middlemiss, Dan. "Economic Considerations in the Development of the Canadian Navy Since *1945*." In *The RCN in Transition: 1910-1985,* edited by W.A.B. Douglas, 187-208. Vancouver: University of British Columbia Press, 1988.

Middlemiss, D.W. and J.J. Sokolsky. *Canadian Defence: Decisions and Determinants.* Toronto: Harcourt, 1989.

Milner, Marc. *Canada's Navy: The First Century*. Toronto, Buffalo and London: University of Toronto Press, 1999.

Pile, T.H.W. "Beyond the Workable Little Fleet: Post-war Planning and Policy in the RCN, 1945-1948." MA Thesis, University of Victoria: 1998.

Sokolsky, Joel. "Canada and The Cold War at Sea, 1945-1968." In *The RCN in Transition: 1910-198.* Edited by W.A.B. Douglas, 210-235. Vancouver: University of British Columbia Press, 1988.

Todd, Daniel and Michael Lindberg. *Navies and Shipbuilding Industries: The Strained Symbiosis*. Westport, CT and London: Praeger, 1996.

Treddenick, John M. "The Economic Significance of the Canadian Defence Industrial Base." In *Canada's Defence Industrial Base*, edited by David G. Haglund, 97-117. Kingston: Frye and Company, 1988.

Tummers, Edward L. Editor. *Maritime Security in the Twenty-First Century*. Dalhousie Centre for Foreign Policy Studies, Occasional Paper No. 11, Halifax: Dalhousie University.

Whitby, Michael, Richard H. Gimblett and Peter Haydon. *The Admirals: Canada's Senior Naval Leadership in the Twentieth Century*. Toronto: Dundurn Press, 2006.

Williams, Alan. *Reinventing Canadian Defence Procurement: A View from the Inside.* Kingston: McGill-Queen's University Press, 2006.

DND/Government Documents/Canadian Forces College Papers

Arsenault, J.W. "The DDH 280 Program: A Model of How Not To Build Canada's Next Warship – The CPF." Toronto: Canadian Forces Command and Staff Course New Horizons Paper, 1981.

Brock. Rear-Admiral Jeffry. *Report of the Ad Hoc Committee on Naval Objectives*, Ottawa: Royal Canadian Navy, July 1961.

Canada. Department of Finance. "Advantage Canada, Building a Strong Economy for Canadians." Summary. November 2006. Internet; http://www.fin.gc.ca/ec2006/plan/pltoc-eng.asp. accessed 30 March 2009

Canada. Department of Finance. *Budget 2009.* available from http://www.budget.gc.ca/2009/plan/bptoc-eng.asp.Internet; accessed 1 February 2009.

Canada. Department of National Defence. *Canada First Defence Strategy.* Ottawa: Information Distribution Centre Communications Branch, 2008. available from http://www.forces.gc.ca/site/focus/firstpremier/June18_0910_*CFDS*_english_low-res.pdf; Internet; accessed 18 December 2008.

Canada. Department of National Defence. Capability Investment Database (CID), Project Number 00001216, *Arctic Offshore Patrol Ship*. available from: http://otg-vcd-webs018.ottawa-hull.mil.ca/CID/search_e.asp; accessed 18 March 2008.

Canada. Department of National Defence. Capability Investment Database (CID), Project Number 00001336, *Canadian Surface Combatant*. available from http://otg-vcd-webs018.ottawa-hull.mil.ca/CID/search_e.asp; accessed 18 March 2008

Canada. Department of National Defence. Capability Investment Database (CID), Project Number 00002673, *Joint Support Ship*. available from http://otg-vcd-webs018.ottawa-hull.mil.ca/CID/search_e.asp Accessed 18 March 2008; DND Intranet; accessed 18 March 2009.

Canada. Department of National Defence, *Joint Support Ship: Statement of Operational Requirement.* available from http://www.forces.gc.ca/admmat-smamat/jss-nsi/documents/JSS_SOR_V_4.1.pdf; Internet; accessed 23 March 2009.

Canada. Department of National Defence. *Leadmark: The Navy's Strategy for 2020*. Ottawa: Directorate of Maritime Strategy, 2001.

Canada. Department of National Defence. *Securing Canada's Ocean Frontiers: Charting the Course from Leadmark*. Ottawa: Directorate of Maritime Strategy, 2005.

Canada. Fisheries and Oceans Canada. "Canadian Coast Guard: Our Fleet." available from http://www.ccg-gcc.gc.ca/eng/CCG/Our_Fleet; Internet; accessed 1 April 2009.

Canada. Fisheries and Oceans Canada. *Canadian Coast Guard: 2006-2007 Fleet Annual Report*. Ottawa: Canada Communciations Group, 2007.

Canada. House of Commons, *Debates*, 23 October 1945: 1368, Quoted in T.H.W. Pile, *Beyond the Workable Little Fleet: Post-war Planning and Policy in the RCN 1945-1948,* MA. Thesis, University of Victoria, 1998.

Canada. House of Commons. *Debates*. Friday, 21 November 2008, Available from http://www2.parl.gc.ca/HousePublications/Publication.aspx?Language

=E&Mode=1&Parl=40&Ses=1&DocId=3614314; Internet; accessed 23 March 2009.

Canada. House of Commons. *Debates.* Monday 2 February 2009. available from http://www2.parl.gc.ca/HousePublications/Publication.aspx?Language=E&Mode=1&Parl=40&Ses=2&DocId=3636715; Internet; accessed ; 25 March 2009.

Canada. House of Commons. Standing Committee on National Defence and Veterans Affairs. *Minutes of Proceedings and Evidence.* 22 February 2007. available from http://www2.parl.gc.ca/CommitteeBusiness; Internet; accessed 15 October 2008

Canada. House of Commons. Standing Committee on International Trade, *Minutes of Proceedings and Evidence*. Tuesday, 2 March 2009, available from http://www2.parl.gc.ca/HousePublications/Publications.aspx?DocId=3711341; Internet; accessed 28 March 2009

Canada. Industry Canada. *A New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry: Focusing on Opportunities 2001*. Ottawa: Information Distribution Centre Communications Branch, 2001. available from http://www.shipbuilding.ca/graphics/response-nc.pdf; Internet; accessed 10 February 2009.

Canada. Industry Canada. National Shipbuilding and Industrial Marine Partnership Project. *Breaking Through: The Canadian Shipbuilding Industry*. Ottawa: Information Distribution Centre Communications Branch Industry Canada, 2001. available from http://www.shipbuilding.ca/graphics/MINIbreaking_e.pdf; Internet; accessed 10 February 2009

Canada. Industry Canada. *The Industrial and Regional Policy Benefits Policy*. http://strategis.ic.gc.ca/epic/site/ad-ad.nsf/en/ad03658e.html; Internet; accessed 15 February 2009

Canada. National Research Council. "Marine and Ocean Industry Technology Roadmap, Final Report." (Ottawa: 11 February 2003).

Canada. Office of the Prime Minister. "Prime Minister Stephen Harper announces new Arctic offshore patrol ships," speech at HMC Dockyard Esquimalt, BC 9 July 2007 available from http://pm.gc.ca/eng/media.asp?category=1&id=1742; internet; accessed 26 February 2009.

Canada, Office of the Prime Minister "Prime Minister Harper announces Navy ship upgrades," speech at HCM Dockyard Halifax, 5 July 2007.available from http://pm.gc.ca/eng/media.asp?category=1&id=1730;Internet; accessed 26 February 2009.

Canada. Treasury Board Secretariat. *Risk Managagement Policies*. available from http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/riskmanagement/siglist-eng.asp; Internet; accessed 6 April 2009.

Greenwood, Captain (N) R.W. "Globalization, Maritime Strategy, and the Survival of the Canadian Marine Industry." Toronto: Canadian Forces College, National Security Studies Course Paper, 2005.

Greenwood, Commodore R.W. "Striving for Sustainable Warship Design and Construction." Presentation to Naval Summit 29 April 2008, with permission.

Kurtz, Lieutenenant Commander M.T.J. "Policy, Transformation and Shipbuilding: The Perfect Storm Threatening the Future of Canada's Surface Combatant Fleet." Toronto: Canadian Forces College, Master of Defence Studies Research Paper, 2007.

Sing, Lieutenant Commander D. "Procuring Warships For the Canadian Navy: Does Canada Spend Its Money Wisely? Toronto: Canadian Forces Command and Staff Course New Horizons Paper, 1995.

Electronic Sources

Allied Shipbuilders Limited. "Shipbuilders, Ship Repairers and Marine Engineers." available from http://www.alliedship.com/index.php/products_services/; Internet; accessed 19 April 2009.

Bowering: Cdr (Ret'd) Ken. "Military/Naval Procurement in Canada: A Flawed Process," *The Conference of Defence Associations Institute: General Sir Arthur Currier Paper 1-08* (19 November 2008). Journal on-line: available from http://cda-cdai.ca/Currie_Papers/Currie%20Paper%201-08%20Navy%20League.pdf; Internet; accessed 17 December 2008.

Brewster, Murray."Fed Eyes Shipbuilding as Economic Stimulus," available from http://cnews.canoe.ca/CNEWS/Canada/2008/12/14/7748116-cp.html ; Internet; accessed 18 February 2009.

Cairns, Peter. "A Flood of Announcements and What They Mean." *Shipbuilding Association of Canada* – Articles, (August 13 2007); available from http://www.shipbuilding.ca/articles/article_aug13-07.shtml; Internet; accessed 15 September 2008.

Cairns, Peter. "Shipbuilding Transformation," *Shipbuilding Association of Canada* – Articles. (22 May 2006); available from http://www.shipbuilding.ca/articles/article_may22-06.shtml; Internet; accessed 15 October 2008.

Cairns, Peter. “Crisis in Naval Shipbuilding? Canada Must Maintain Homegrown Capacity,” *Shipbuilding Association of Canada* - Articles. available from http://www.shipbuilding.ca/articles.shtml; Internet; accessed 15 October 2008.

Cairns, Peter. “Renewing the Navy – The Process Begins.” *Shipbuilding Association of Canada* – Articles. (14 March 2005); available from (http://www.shipbuilding.ca/articles.shtml; Internet; accessed 15 October 2008.

Cairns, Peter. “Shipbuilding Demand and Capacity.” *Shipbuilding Association of Canada* - Articles (30 October 2006).Available from http://www.shipbuilding.ca/articles.shtml; Internet; accessed 15 September 2008.

Cardwell, Mark. “Lifeline Keeps Davie Shipyard Alfloat.” *The Gazette.* 18 December 2008. http://proquest.com; Internet; accessed 11 January 2009.

Davie Yards Incorporated. “Temporary layoffs at Davie Yards.” Available from http://www.davie.ca/eng/default.aspx?ID=company_467374; Internet; accessed 30 March 2009.

Davie Yards Incorporated. “Marine.” http://www.davie.ca/eng/ default.aspx?ID=business_746265; Internet ; accessed 30 March 2009.

Editorial, *Calgary Herald.* “New Ships Should Be Made In Canada.” 8 August 2008. http://www.proquest.com; Internet; accessed 15 September 2008.

Halifax Shipyard. “Shipbuilding,”available from http://www.irvingshipbuilding.com/marine; Internet; accessed 7 April 2009.

Haydon, Peter T.. “*Canadian Naval Future: A Necessary Long-Term Planning Framework.*” Institute for Research on Public Policy. IRPP Working Paper Series no. 2004-12 (November 2004). Available from http://www.irpp.org/wp/archive/wp2004-12.pdf; accessed 15 January 2009..

Huebert, Rob. “Continental Defence at Sea: The Canadian Challenge.” *Journal of Military and Strategic Studies* Vol 9 Issue 2, (Winter 2006/07). Journal on-line; available at http://www.jmss.org; accessed 17 March 2009.

Hobson, Sharon. “Budget and Compliancy Issues Scupper JSS Plans.”. *Jane's Navy International* (3 September 2008): http://proquest.com; Internet; accessed 16 February 2009.

Kiewit Offshore Services. “Marine and Offshore.” available from http://www.kos.nfld.net/content/ marystown.html; Internet; accessed 7 April 2009.

Lambie, Chris. “New Ships Will Allow Forces to Shape Up.” *Halifax Chronicle Herald*, 20 January 2009. available from http://thechronicleherald.ca/cedrom_archives/; Internet; accessed 15 February 2009.

Lockheed Martin Shipbuilding.“Littoral Combat Ship.” available from http://www.lmlcsteam.com/team.html ; Internet; accessed 5 April 2009.

Pugliese, David. “DND Under Fire For Scoping Out Dutch Shipyard.” *Ottawa Citizen,* 6 August 2008. http://www.proquest.com; Internet; accessed 15 September 2008.

Ross, Jim. “Introduction to Project Alliancing.” Available from http://www.alliancingassociation.org/Content/Attachment/Introduction%20to%20Project%20Alliancing%20-%20Jim%20Ross%202000.pdf; Internet; accessed: 29 March 2009.

Seaway Marine and Industrial “Shipbuilding.” available from http://www.seamind.ca/index.php?screen=shipbuilding; Internet; accessed 9 April 2009.

Shadwick, Martin. “Maritime Futures.” *Canadian Military Journal* Vol. 8 No.2 (Summer 2007) journal on-line; available from http://www.journal.forces.gc.ca/vo8/no2/index-eng.asp; Internet; accessed 22 January 2009.

Trimble, Stephen. “Canada Seeks Shipbuilding Stability.” *Jane’s Defence Weekly* (8 November 2006). Journal on-line; available from http://www4.janes.com; accessed 18 December 2006.

Trimble, Stephen. “Canada seeks to kick-start sustained shipbuilding plan.” *Jane's Navy International* – 1 December 2006: http://proquest.com; Internet; accessed 2 February 2009.

Washington Marine Group, “Shipbuilding and Repair.” available at http://www.washingtonmarinegroup.com/_global/_content/aboutus.htm; Internet; accessed 7 April 2009.