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PARTNERSHIP, BALANCE AND FLEXIBILITY: A MODEL FOR A SUSTAINABLE NAVAL SHIPBUILDING SECTOR IN CANADA

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ABSTRACT

There have been significant changes in the international shipbuilding industry since the Second World War. Due to strong competition from Asia and dwindling markets, shipyards in western countries have been challenged to find adequate international business opportunities and have thus contracted, relying on national requirements to sustain themselves. In the face of these pressures, two dominant trends have emerged which have enabled countries to sustain a naval shipbuilding sector: transnational cooperative shipbuilding programs, and self-reliant government/industry partnership solutions. Canada, relying in the past on resurrection of a naval shipbuilding sector whenever it needed to renew its naval fleet has expressed a desire to have a sustainable national naval shipbuilding capability. This paper leverages the lessons of other nations who have successfully done so in order to identify strategies applicable to the Canadian experience, which are used to propose a Canadian model designed to satisfy that desire.

INTRODUCTION

In its simplest sense a maritime nation is one with maritime interests. Any nation that includes the maritime environment in defining its sovereignty, trade, environment and security interests is a maritime nation.[1] However, it is important to note that this definition is not all-inclusive. Some nations consider their fishing industries as vital to national interests, but have no maritime security concerns. Others, while considering power projection as vital to their interests, do not concern themselves with fishing or environmental issues. As this explication demonstrates, not all maritime nations have the same maritime interests, and therefore have different components that define their maritime nature. This is why not all maritime nations have a navy. Similarly, not all maritime nations with a navy have a national shipbuilding industry, and even those that might have such an industry, may not have a naval shipbuilding sector within that industry.

The world shipbuilding industry has gone through major changes over the last half-century. Prior to this period, maritime nations built and maintained significant naval, economic and fishing fleets. Since the Second World War, nations have turned away from nationally flagged-and-built fleets. Over the years, a relatively small number of nations have established themselves as global shipbuilders. Consequently, seventy percent of the world's commercial ships are currently built in Asia. The mechanism that created this situation was direct subsidization of the shipbuilding

[1] Captain(N) R Greenwood, "Globalization, Maritime Strategy, and the Survival of the Canadian Marine Industry." (Toronto Canadian Forces College National Security Studies Course Paper, 2005), 3-6.

industries. Subsidization of shipbuilding sectors outside of Asia, never comparatively high, ceased by 2000. However, Asian subsidization, as high as 40 percent, continues. Commercial shipping companies build ships where it is cheapest to do so; hence, Asia has effectively cornered the commercial shipbuilding market. Unable to compete for commercial shipbuilding, all other nations have been forced to sustain their respective shipbuilding sectors with niche markets, such as naval ships. This reality has created an international situation where nations must rely on their respective navy's to sustain a shipbuilding sector. Relatively few countries retain a naval shipbuilding sector, with most of the export market dominated by only two countries: France and Germany. Most nations build ships for their respective domestic market only.

Naval nations generally fall into three categories: those that acquire their naval platforms from other nations – "buy-offshore"; those who rely on a naval sector that is part of a national shipbuilding industry vital to the national economy; and finally, those that view their navy as a vital strategic asset and retain a national naval sector in order to support it. For nations in the second group, government decisions concerning naval platform acquisition are made with sustainment of the national economy as the primary concern. These countries view the navy as a means to sustain the naval sector. These nations are generally, but not exclusively, characterized by smaller navies, a reliance on international sales of naval platforms, involvement in cooperative naval shipbuilding programs with other nations, and, more direct government subsidization of the naval sector than nations in the third

group. Nations in the third group rely on a national naval shipbuilding and repair sector to sustain their navy. In contrast to nations of the second group, these nations generally possess larger navies capable of power projection on a global scale, and a naval shipbuilding sector that relies almost exclusively on free-market sustainment. Characteristics of these nations include little if any direct subsidization, the national navy as virtually the only sector customer, and, no reliance on international sales. For these nations, a larger navy means many naval ships. Nonetheless, the naval requirement is generally incapable of sustaining the naval sector due to the 'boom or bust' nature of naval building programs.

While both groups sustain a national naval sector, the motives and success with which they do so are significantly different, resulting in notably different approaches to how these sectors are sustained. Similarly, while these national sectors have similar characteristics, they also display distinct differences. The characteristics generally attributed to each group and the differing approaches to how they maintain national naval sectors is worthy of examination in the development of a national naval shipbuilding sector sustainment model applicable to Canada.

With the exception of the United Kingdom (UK), European Union (EU) nations fall into the category of those nations whose naval sector is part of a larger shipbuilding industry vital to their national economies. Respective national naval sectors have traditionally been characterized by substantial direct subsidization from national governments, major reliance on foreign sales, and in many cases, significant

government-ownership in the sector. Due primarily to anti-subsidization policies in the European Union (EU) and strong competition from Asian shipbuilders, these sectors have evolved over the last twenty years to minimize costs and maximize efficiencies. European Union national naval shipbuilding sectors are characterized today by consolidation of individual shipyards within states (in most cases to a single company) as well as international cooperative shipbuilding programs between states. This trend is expected to evolve in future toward increased international consolidation and national specialization. Carried to its extreme, one can envision EU cooperative naval shipbuilding programs with participating nations providing specialized components: hulls built in France; propulsion systems in Germany, weapons systems in the Netherlands etc. Further, current indications are that new eastern European countries joining the EU and NATO will follow similar trends. This *Transnational Sustainment Model* addresses many of the issues faced by European nations: The risk and cost of new programs are shared between countries; the dependency on a navy to sustain a national sector is reduced – a benefit for nations with smaller navies; national sectors are permitted to become highly specialized; and, viewed as a whole, the individual national sectors complement each other instead of competing directly.

Countries such as the United Kingdom (UK), the United States (US), and Australia possess naval shipbuilding sectors which are very distinct from the EU nations. Historically, there has been very little direct government subsidization of their naval sectors, no government ownership, and minimal foreign sales, if any. These nations have traditionally relied on a free-market approach to sustainment of

their national sectors, with national defence being the principal customer. While adequate in the past, this free-market approach ceased to be viable in the face of Asia's overwhelming competition for the commercial shipping market. All three nations are shifting away from a free-market approach to a *Government/Industry Partnership Model*. This model is generally characterized by non-competitive contracting or sole-sourcing, and government commitment to a long-term naval shipbuilding plan. Similar to the EU nations, the UK, the US and Australia have also consolidated their respective shipbuilding sectors. However, the motives which drove this consolidation are significantly different from those of the EU nations. In the case of the US and UK, consolidation was primarily driven by free-market attrition. However, there has also been a concern on the part of these governments that the national sector would be unable to meet future naval building demands. Specifically, governments in these two countries worried that a dispersed naval sector unnecessarily spread an already small number of skilled workers amongst several shipyards, and as a result, the sector as a whole would be unable to meet national naval shipbuilding requirements. The numbers and size of shipyards in these countries was such that the capacity of the national sector was hugely higher than government demand could ever sustain. Thus consolidation was a means to gain efficiencies and maximize limited skilled personnel resources. This situation was particularly significant to Australia which, due primarily to relatively smaller budgets and a significantly smaller navy, could not create enough demand to sustain the sector it possessed. Thus this island nation also went through a consolidation and

government-industry partnership process in order to better match the sector capability to anticipated future demand.

Canada is a large coastal state with maritime interests, and therefore, according to Greenwood, a maritime nation. Whether as a maritime nation or a nation with maritime interests, Canada has acknowledged that it does not possess a sustainable naval shipbuilding sector, but wishes to have one. Canada's naval shipbuilding programs have migrated from a relatively coherent national maritime policy in the 1960s, focused on balancing naval requirements with sustainment of a strategically important national sector, to a "stuttering approach" marked by a boom or bust cycle which produces new platforms just in time to avoid obsolescence, but which is neither capable of satisfying naval requirements nor sustaining a national naval sector in the long term. [2] As such, Canadian naval shipbuilding policies and programs since the Second World War have exhibited elements of both groups: sector protectionism, subsidization and free-market sustainment. Interestingly, despite facing some of the same realities as other maritime nations – strong competition from Asian shipyards, a shrinking skilled workforce, a relatively small navy, and a finite naval acquisition budget – Canada has neither consolidated its national sector, participated in cooperative programs with other nations, nor moved away from a free-market sector sustainment policy. In short, Canada has yet to go down the same road as other nations wishing to sustain a national sector. This situation actually

[2] Senator Colin Kenney, "Canada's Navy Needs Ships. Canadian Workers Need Quality Jobs. Ottawa Should Connect The Dots," *Ottawa Citizen*, 8 August, 2008, available from http://sen.parl.gc.ca/ckenny/2008%20OPED%20-%20Citizen%20Ships.htm; Internet; accessed 9 December, 2008.

represents an opportunity for Canada. Not having yet transitioned its naval shipbuilding sector as other notable nations have, Canada has the chance to learn from the shipbuilding experiences in other countries, and other parts of the globe.

Unless Canada's situation were particularly unique, then it could be assumed the lessons learned from international shipbuilding experiences could be leveraged in development of a sustainment solution for Canada. The question to be addressed would simply be, "Which model would work best for Canada?" Unfortunately the problem with respect to Canada is somewhat more complex. History and geography have both impacted the Canadian circumstance in such a way that Canada does not fit neatly into any of the groups so far discussed: those that rely on a transnational model to sustain a national naval sector, those that rely on a government/industry partnership model to sustain their national sector, and, those that do not have a national sector and purchase their naval platforms from other nations. Additionally, while the Canadian government has explicitly stated that it wishes to have a nationally sustained naval shipbuilding sector, politicians have yet to explain why a national naval sector is important to Canada, or whether Canada is even capable of sustaining such a sector.

Since Canada does not fit neatly into any of the three groups presented, this paper examines all three international options, and while examining the issue of what option would work best for Canada, concludes there is a fourth option. Canada must find its own way in sustaining a national naval sector by drawing upon the methods used by other nations deemed most applicable to the Canadian context.

THE EUROPEAN EXPERIENCE: SUBSIDIES, EXPORTS AND TRANSNATIONAL COOPERATION

In the past, nations maintained large, nationally-flagged commercial fleets for international trade, and navies to protect them. In turn, they depended on vital national shipbuilding industries to satisfy their demands for commercial and naval ships. While maritime trade is still important to world economies, globalization, and a universal drive for cost effectiveness over the last half-century has resulted in commercial ships now being built primarily in Asian shipyards and flagged in relatively few, primarily developing nations. Today, approximately seventy percent of the world's commercial ships are built in Asia[3], primarily in South Korea and China.

Asian shipyards were able to corner the large, lucrative commercial shipbuilding market by virtue of heavy government subsidization as compared to most western nations. In 2000 alone, the Asian market secured ninety percent of world commercial orders[4]. Canada and the United States ceased direct subsidization by the mid-1970s, and their respective shipbuilding industries, already struggling, ceased completely to compete for international shipbuilding business. Until recently, European nations maintained a pan-Europe policy which allowed up to nine percent

[3] Britain, The Secretary of State for Defence, "Defence Industrial Strategy: Defence White Paper," available from http://www.official-documents.gov.uk/document/cm66/6697/6697.asp; Internet; accessed 3 November 2008, 70.

[4]Bernd Klein, "German Shipbuilding and Marine Equipment Industry in 2003,"(British Consulate-General, Hamburg: Sector Report, 2004), available from http://www.marinesoutheast.co.uk/docs/research/; Internet; accessed 11 Feb 2009.

of direct government subsidization of the industry[5]. However, even this level of subsidization compared unfavourably to countries such as South Korea which continues to subsidize its shipyards by at least forty percent. The EU officially ended direct subsidization in Europe in December 2000, despite strong opposition from countries such as France, Germany, and Spain. Commercial shipping companies build ships where it is cheapest to do so, and most have their ships built in South Korea, Brazil and China. Thus, South Korea and other Asian nations have effectively eliminated any other foreign competition to commercial shipbuilding industries.

Unable to compete for commercial shipbuilding, most other nations have been forced to sustain their respective shipbuilding sectors with niche business such as naval, cruise, pleasure, and ferry vessels. In effect therefore, Asian dominance of the commercial market has created an international situation where western nations must rely on naval shipbuilding to sustain a national shipbuilding sector. There are relatively few countries that build ships anywhere. Of these, only a small group actively retain a naval shipbuilding sector: Germany, the Netherlands, France, Italy, Spain, United Kingdom (UK), Russia, United States (US), Canada, Australia, Japan, China, and India. Europe and the US dominate the world naval shipbuilding industry, with France and Germany together controlling more than 60 percent of the military

[5] Gledhill, Dan. "Shipbuilders call for fair market as EU subsidies end". *The Independent* (10 December 2000),[journal on-line]; available from http://www.independent.co.uk/news/business/news/shipbuilders-call-for-fair-market-as-eu-subsidies-end-627987.html; Internet; accessed 9 Mar 2009. Subsidy contributions in 1998 just prior to the end of subsidies under new EU rules in 2000: France - 8.6%; Germany - 6.4%; UK - €100m (percentage unk), but was opposed to subsidization.

export market. [6] Most nations, including the UK and the US (the 1st and 4th largest producers of military vessels worldwide) build for their respective domestic markets only.[7]

THE EUROPEAN UNION

With the exception of the UK, European maritime nations, to varying degrees place significant importance on naval shipbuilding sectors as a key component of their national shipbuilding industries. For these nations, national economic interests and concerns to sustain a healthy industrial sector drive decisions about naval platform acquisition. The export market for naval ships is small and highly competitive. In an analysis of the German sector in 2003, Juergen Mueller stated that "35% of submarine contracts, 68% of frigate contracts, and 72% of fighting ships and mine detector contracts are given to national marine shipyards around the world, which leave few contracts for international competition."[8] Similarly, Asian dominance of the commercial market leaves few opportunities for European shipyards to compete for commercial contracts. The EU response to this situation has been to rely on domestic requirements to sustain national shipbuilding sectors instead of international contracts. However, domestic requirements alone are inadequate to sustain some of the larger European sectors, so the majority of EU nations also pursue

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[6] Britain, The Secretary of State for Defence. "Defence Industrial Strategy: Defence White Paper,"…, 70.

[7] Ibid., 70.

[8] Juergen Mueller, "International Market Reports (IMRR): The German Shipbuilding Market," (2003 available from http://strategis.ic.gc.ca/eic/site/imr-ri.nsf/eng/gr110193.html; Internet; accessed 9 March 2003.

cooperative naval shipbuilding ventures with each other as a means of effectively broadening their 'collective domestic' market. Additionally, European shipyards have sought additional markets in the developing world. They have had some limited success in this, by making themselves competitive on the basis of quality over cost, and by focusing on more complex ship platforms, such as naval and special application vessels. Europe currently accounts for twenty percent of world ship production by focusing on specialized vessels instead of commercial ships.[9] Only the UK, France, Germany, Italy, Spain, and the Netherlands possess a naval shipbuilding sector.

In order to gain some economies of scale and make themselves more competitive on a cost basis, European shipyards have gone through an extensive sector consolidation process in order to minimize workforce and infrastructure requirements. Further, this process of consolidation appears to be moving toward a pan-European consolidation. The experiences of France, Spain and Germany are representative of the European experience, and provide a better insight into the significance of these changes.

France

France has long maintained a strong naval sector. The French naval sector, as a component of its significant defence industries, is very important to the French economy. Defence industries in France employ over 175,000 workers, representing

[9] Britain, The Secretary of State for Defence. "Defence Industrial Strategy: Defence White Paper,"…, 70.

4.5 percent of its industrial workforce. In 2001, France's defence industries generated €15B.[10] In 2005, this sector was dominated by three companies, the largest of which Direction de Construction Navale (DNC) was state-owned. All three complemented each others activities, and as early as 2005, it was expected they would consolidate into a single entity. The French national sector achieved full consolidation when Thales (France) and DNC consolidated into a single entity under the government-owned DNC in Jan 2007. Indicative of the importance of this sector to France's national interests, consolidation was achieved through indirect government purchase via a friendly DCN takeover of Thales. France now has a single, 75% state-owned naval shipbuilding entity.[11] France has also been very clear that it wants a strong [defence] foreign sales presence[12], and remains among the few EU nations still actively trying to compete on the international market.[13] In fact, together with Germany, France controls 60 percent of the world export market in military arms sales on the naval side. [14] The French industry is concerned over what it perceives as a future threat from emerging naval shipbuilding nations such as

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[10] Cara Boulesteix, "International Market Reports (IMRR): The French Aerospace and Defence Industry," (2001) available from http://strategis.ic.gc.ca/eic/site/imr-ri3.nsf/eng/gr-76572.html; Internet; accessed 16 March 2009.

[11] DCN, "Convergence of Thales and DCN's French Naval Activities," available from http://www.thalesgroup.com/Press-Room/Focus-search-result/Focus-Article.html?link=04155918-2423-6645-5E02-500A286B347D:central&locale=ENb&Title=Convergence+of+Thales+and+DCN%C2%92s+French+naval+activities&dis=1; Internet; accessed 7 Feb 2008.

[12] Elvira C Iturrioz, "The Future of the European Naval Defence Industry," available from http://www.assembly-weu.org/en/documents/sessions_ordinaires/rpt/2005/1916.php; Internet; accessed 29 Jan 2009.

[13] John Birkler, Denis Rushworth, James Chiesa, Hans Pung, Mark Arena, John Schank, "Differences Between Military and Commercial Shipbuilding: Implications for the United Kingdom's Ministry of Defence," Report prepared for the UK MoD. Rand Europe, 2005. Available from http://www.rand.org/pubs/monographs/MG236/; Internet; accessed 11 November 2008, 26.

[14] Britain, The Secretary of State for Defence. "Defence Industrial Strategy: Defence White Paper,"…, 70.

China, Russia and South Korea.[15] France believes the best response to this threat is a pan-European consolidation. France intends to position itself as the leader in a consolidated, transnational EU shipbuilding sector, and has thus been very proactive to ensure its national sector was sound in principle prior to consolidation. Pending the next phase of any drive toward transnational consolidation in Europe, France strongly supports the European Defence Agency, the military arm of the European Union, as the body through which naval sector consolidation in Europe will occur.[16] As a preliminary step, and in order to drive the consolidation process forward, France has already become involved in several cooperative ventures with Germany, Spain, Italy, and the UK.

Spain

Although once significantly government-funded and subsidized, Spanish shipyards are now state-owned, under one umbrella company following a 20 year plan for industry consolidation. The workforce has been intentionally reduced from an inefficient 40,000 people two decades ago, to 7,000 today through significant trade union concessions which included: regrouping the various shipbuilding centres into five shipyards (three naval, two civilian) under a single company entity, the elimination of five other shipyards, and, a 40 percent reduction of the labour force through early retirements. An indication of the importance of the naval sector to

[15] Richard Scott, "DCN expresses pessimism over naval consolidation propects for Europe," *Jane's Navy International* Vol. 112, no.1 (Jan/Feb 2007), 33.

[16] Elvira C Iturrioz, "The Future of the European Naval Defence Industry,"…

Spain's economy, as suggested by the European Defence Agency report, was Spain's decision to pull out of Iraq in 2004 in order to position itself to compete on the international submarine market, anticipating €8B in future orders.

Spain was a pioneer in the trend towards transnational ventures starting in the mid-1990s with a highly successful cooperative program with the Netherlands. Spain has continued to seek out opportunities for international cooperative ventures, participating in mutual naval shipbuilding programs with the Netherlands, Germany and the US. As a result of proactive foreign sales, it also produces several naval vessels for foreign governments. In addition to several domestic requirements, construction orders in 2005 included: 6 frigates for Norway, 6 submarines for Chile and Malaysia, and involvement in construction of 2 Littoral Combat Ships for the US. Foreign and domestic orders for 2005 totaled over €3.6B. Similar to France, Spain is keenly interested in progressing towards pan-European consolidation, and sees itself as competing with France for leadership. [17]

Germany

The shipbuilding industry in Germany has traditionally been a significant contributor to the national economy. In 2001, the German shipbuilding industry, the 4th largest in the world, employed 220,000 people making it "a significant pillar of the German economy."[18] In the same year, the naval sector alone accounted for over

[17] Elvira C Iturrioz, "The Future of the European Naval Defence Industry,"…

[18] Juergen Mueller,"International Market Reports (IMRR): The German Shipbuilding Market,"...

75% of marine production in Germany.[19] Unlike other European nations which ended sector subsidization in December 2000,[20] German shipbuilders continued to rely on government subsidies until 2003 in order to remain competitive in the international shipbuilding sector.[21] The effect of competition is reflected in decreasing sales from a high of €5.2B in 2002 to new orders in 2003 totaling only €3.6B.[22] Without subsidization, Germany has found it difficult to compete for commercial orders with the heavily subsidized Asian builders. However, Germany has rebounded to a degree and continues to maintain significant military and specialty vessel exports, thus demonstrating the potential of niche markets for international sales. [23] In fact, together with France, Germany currently controls 60 percent of the global naval export market.[24] Germany initiated consolidation in 1999 in order to reduce manpower, and duplication amongst several competing shipyards, and make itself more internationally competitive.

The consolidation of six separate naval shipbuilding companies into Thyssen Krupp Marine Systems finished by 2004. Although these consolidations were accomplished through market byouts and mergers, they were facilitated through strong political will and direct influence from the German government, who was motivated to strengthen Germany's international competitiveness. Unlike other

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[19] Juergen Mueller, "International Market Reports (IMRR): The German Shipbuilding Market,"...

[20] Dan Gledhill, "Shipbuilders call for fair market as EU subsidies end"…

[21] Bernd Klein, "German Shipbuilding and Marine Equipment Industry in 2003,"…

[22] Ibid.

[23] John Birkler, Denis Rushworth, James Chiesa, Hans Pung, Mark Arena, John Schank,"Differences Between Military and Commercial Shipbuilding: Implications for the United Kingdom's Ministry of Defence,"…, 26.

[24] Britain, The Secretary of State for Defence, "*Defence Industrial Strategy: Defence White Paper*,"…, 70.

European countries the German sector is not dominated by a single entity. Thyssen-Krupp is focused solely on the defence sector, but there are two other companies involved in different aspects of the marine building sector (tanker and pleasure craft). However, each company due to strong government influence and control, has clearly defined, non-overlapping sectors in the marine industry. While open to the concept of transnational cooperation, Germany has indicated it must first achieve full national consolidation, which will take some time to accomplish. Thus far, it has not indicated its position on a pan-European sector consolidation. [25] However, as indicated by the head of France's DCN, Jean-Marie Poimboeuf in 2007, "I think the competition emerging from China, Russia, and South Korea will be the big spur to increased co-operation [between EU members] in the longer term." [26]

The Future of the European Naval Defence Industry

In the past, the European naval shipbuilding industry was generally characterized by over-capacity and varying levels of national subsidization.[27] The current industry is characterized by consolidation into singular 'national' companies, and transnational cooperative ventures. National consolidation was a simple case of adjusting the national sectors to a size that could be supported by demand generally achieved through natural attrition and company merger, but with government support and encouragement. The future trend appears to be consolidation of national sectors into a larger pan-European sector.

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[25] Elvira C Iturrioz, "The Future of the European Naval Defence Industry,"…

[26] Richard Scott, "DCN expresses pessimism over naval consolidation propects for Europe,"…, 33.

[27] Elvira C Iturrioz, "The Future of the European Naval Defence Industry,"…

The reason for this drive towards a pan-European consolidation was best expressed in a recent article which indicates that a consolidated European naval sector will be better positioned to face increasing competition from China, Russia and South Korea.[28] This concern likely stems from the past European experience with competition from Asian shipyards for commercial contracts. China, Russia and South Korea developed the more complex capabilities required to build modern warships, and, together with their comparatively low labour costs, and industry subsidization are likely to soon be in a position to challenge the international naval market currently controlled by France and Germany. This seems a valid concern given a recent article in *Naval Forces*, where Russian authorities have explicitly stated that Russia intends to acquire more naval export market share in order to sustain its recently consolidated naval sector.[29] This underlying concern was earlier expressed in 2004 when, on the subject of pan-European consolidation, an EU report included the following statement: "European naval shipbuilding is dominated by national companies. Without increased cooperation and consolidation, European players risk being marginalized in global terms…"[30] This pan-European consolidation is significant as it takes the global trend towards national sector consolidation to a new transnational level. This will, however, present huge challenges. At present, national naval shipbuilding companies are subject to national rules and policies. Those same rules

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[28] Richard Scott, "DCN expresses pessimism over naval consolidation propects for Europe,"…, 33.

[29] Vladimir Scherbakov, "Survival Through Consolidation and Export: Russian Shipbuilding Industry in Present Days," *Naval Forces* 28, no. 3 (2007), 61-62.

[30] "Leadership 2015: A European Approach to Naval Shipbuilding Needs," *NATOs Nations and Partners For Peace*, no.3 (2004), 136-140, [journal on-line]; available from http://web.ebscohost.com; Internet; accessed 6 January 2009, 136.

continue to exist in a cooperative venture but outside of the national boundaries to which they normally apply. As a result, government intervention will likely be necessary to achieve consolidation in Europe.[31] Just a few of the hurdles to be overcome include standardization of naval platforms, establishment of European industry standards, cross-border technology transfers, and changes to national budgetary and acquisition policies. These challenges require a multi-national body to reach concensus solutions. The European Defence Agency, established by the European Union, is seen as the organization best positioned to solve these challenges[32]. In fact, formal discussions have already begun, and it can be anticipated, that European transnational consolidation will likely occur.[33] That said, there is currently adequate work to sustain national sectors in Europe, thus no strong impetus to move forward on transnational consolidation. However, it is expected that increased competition from emerging naval shipbuilders will drive Europe to a pan-European sector by 2020. [34]

The Transnational Sustainment Model

European maritime nations, each with a long history of building ships, and a shipbuilding industry that was a major component of their respective national economies found themselves unable to compete in the international shipbuilding

[31] Iturrioz Elvira C Iturrioz, "The Future of the European Naval Defence Industry,"…
[32] Britain, The Secretary of State for Defence, "Defence Industrial Strategy: Defence White Paper, "…, 26.
[33] Iturrioz Elvira C Iturrioz, "The Future of the European Naval Defence Industry,"…
[34] Richard Scott, "DCN expresses pessimism over naval consolidation propects for Europe,"…, 33.

market with Asian shipyards. Heavy subsidization in Asia, as high as 40 percent, allowed shipyards in the Far-East to outbid European shipyards, effectively cornering the commercial shipbuilding market. Exclusion from the international commercial market coupled with an international tendency for countries to build their naval vessels in their own countries, left European shipyards with very few opportunities for international contracts. In response, these nations first made themselves more efficient by consolidating shipyards and worker resources into singular national shipbuilding entities. They next focused efforts on niche building markets, such as naval ships and specialty craft. Finally, since national requirements were inadequate to sustain the still relatively large shipbuilding sectors that remained after consolidation, countries turned to cooperative ventures with other European nations. The aim of these cooperative ventures was to expand their individual market potential rather than competing over a diminishing market. The next logical stage for this trend is transnational cooperation on a pan-European scale instead of cooperative ventures with one or two other nations at a time. This evolution is inevitable if European naval shipbuilders wish to continue to remain competitive for international naval contracts. Competition from countries like Russia, China and South Korea will require European yards to produce at the lower costs, and increased efficiencies that can only be achieved through consolidation of their individual naval sectors. The best approach would be to maximize on the synergistic relationship that could be achieved by specialization at the ship sub-assembly level. In other words, some sectors would specialize in building ship hulls, others in propulsion systems, and still others in electronics and system integration.

This *Transnational Sustainment Model*, manifested in a pan-European naval shipbuilding sector consisting of individual national shipbuilding entities working together in cooperative building programs, and leveraging the best resources, skills and capabilities from each component nation, provides significant advantages. First, a pan-European naval shipbuilding sector will be large enough, and have such a wide range of resources that it will be better able to compete with foreign shipyards for international contracts. Second, while individual nations are sharing a market, and therefore potentially getting a smaller piece of the pie as it were, they are also sharing the risks and costs associated with new shipbuilding programs. Further, sharing the available market guarantees everyone some business, thereby removing dependency on their respective navy's to sustain the national sector. Finally, the process of super-specialization will likely result in better quality at reduced development costs, because the requirement for national development of systems will be eliminated.

On the face of it, the *Transnational Sustainment Model* does not appear to have much relevance for Canada. While one might argue that the North American Free Trade Agreement (NAFTA) holds similarities to the European Union (at least economically), membership is currently limited to Canada, the US, and Mexico. For reasons which will be discussed in the next chapter, the US is not likely to pursue transnational ventures, thus leaving only Mexico as a potential Canadian partner.

Ultimately, the main function of this model is to sustain naval export markets for national shipyards. Except for some unsuccessful attempts to enter the international naval arms market following the completion of the Canadian Patrol Frigate Project, Canada has never been involved in international naval arms sales. While doing so would provide some much needed work for Canadian shipyards, global reality is such that Canada could not realistically expect to become competitive in this market. In the unlikely event Canada was able to gain access to naval export markets, then this model would have applicability to Canada.

THE 'AUSUKUS' EXPERIENCE: FREE-MARKET, SELF-RELIANCE AND PARTNERSHIP

In contrast to the European Union group the United States, the United Kingdom and Australia, the 'AUSUKUS' group, view their naval shipbuilding sectors as vital strategic assets, necessary to maintaining a strong navy. For these countries, defence and global power projection have always been critical components of their countries foreign policy, with their navies playing major roles. These nations have traditionally had a heavy reliance on maritime trade for sustainment of their respective economies, thus a strong navy, capable of ensuring international trade routes remained free and open, has always been a necessity. A strong, capable navy had generally meant a large navy composed of a wide variety of vessels. Australia, while possessing a navy much smaller than the UK or US, places the same significance on its navy as does the two more powerful countries, as indicated by the fact that Australia's navy is significantly larger than a country with the population of Australia would normally warrant. Finally, unlike some of the countries in the EU, the US, UK and Australia do not have a history of participation in the international market for naval shipbuilding. This is due to several factors, primary of which is a focus on national defence requirements over the need to become competitive in order to win foreign contracts.

Historically, there has been very little direct government subsidization in these countries, no government ownership, and minimal foreign sales, if any. They have

traditionally relied on a free-market approach to sustainment of their national sectors, with national defence being the principal customer. Traditionally, shipyards in these countries were not specialized and therefore also relied on commercial shipbuilding contracts to help sustain themselves. This dependence on commercial business, also made them susceptible to strong competition from Asian shipyards that affected the EU. While adequate in the past, free-market sustainment of national sectors ceased to be viable because commercial business was no longer available. As a result of these pressures and with a strategic requirement to sustain a naval sector, the three nations started shifting away from a free-market sustainment approach to a *Government/-Industry Partnership Model*. This model is generally characterized by non-competitive contracting or sole-sourcing and guarantees by government of future naval shipbuilding requirements. Similar to the EU nations, the UK, the US and Australia have also consolidated their respective shipbuilding sectors. However, the motives which drove this consolidation are significantly different from those of the EU nations. In the case of the US and UK, consolidation was driven by market pressures and concern on the part of government that the national sector would be unable to respond to anticipated surges in naval shipbuilding programs. Scarcity of contracts forced a degree of consolidation by natural attrition on industry through merging and failure of individual companies. However, governments in these two countries also worried that a dispersed naval sector unnecessarily spread an already small number of skilled workers amongst several shipyards, and as a result, the sector as a whole would be unable to meet national naval shipbuilding requirements. Consolidation was a means to gain efficiencies and maximize limited skilled

personnel resources. Australia, on the other hand, due primarily to limited budgets and a relatively smaller navy, could not create enough demand to sustain the sector it possessed. Thus it also went through consolidation and government-industry partnership process in order to better match the sector capability to anticipated future demand.

The United States

Its 'superpower' status has made the US a preeminent naval power. The US considers a healthy naval shipbuilding sector a key strategic asset because of its relationship to a strong navy. According to the US Department of Commerce, "it is essential that the capability and infrastructure needed to build these [military] ships is resident in the United States because it provides added assurance that they can be built, repaired, and maintained during times of conflict."[35] In this statement, US authorities place importance not only on shipbuilding, but on ship repair as well. This is significant as it helps explain how ship repair and refit capabilities have become important elements in the sustainment of the US naval shipbuilding industry. This industry has been in steady decline since its peak following the Second World War. Heavily subsidized foreign competition, first from Europe then more recently from Asia, resulted in a steady loss of commercial contracts. By the mid-1990s, the only

[35] Robert J White, "Globalization of Navy Shipbuilding: A Key to Affordability for a New Maritime Strategy," *Naval War College Review*, 60, no. 4 (Autumn 2007).

shipyards remaining in the US were either building or repairing US naval ships.[36] In fact, the US is the worlds largest producer of naval ships[37]. Following the end of the cold war and the removal of the soviet navy as its principle enemy, the US navy was downsized from 594 ships of various types and sizes in 1987 to 294 capital ships by 2004.[38] This reduction in naval demand forced naval shipyards to consolidate through market attrition, so that by 2001, there remained only six major private shipyards, owned by two companies.[39] In addition, several public shipyards were used for maintenance of the remaining fleet. Thus, by 2004, the US naval shipbuilding sector, due to reductions in US fleet numbers and low demand for new platforms, had also undergone a major downsizing through years of natural market attrition. Today, remaining private shipyards depend solely on government contracts to sustain themselves.

Concerned over rising costs, schedule overruns, and what it calls a lack of industry re-investment into critical infrastructure[40], the US navy hopes to consolidate the remaining naval shipbuilding and repair sector further into what it calls the "One

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[36] Scott C Truver and John Skovran, "U.S. Shipyards Navigate between a Rock and a Hard Place," *U.S. Naval Institute Proceedings* 130,no.3 (March 2004): 80-92. Available from: http://web.ebscohost.com; Internet; accessed 6 January, 2009.

[37] Britain, The Secretary of State for Defence,"Defence Industrial Strategy: Defence White Paper," …, 70.

[38] Scott C Truver, and John Skovran, "U.S. Shipyards Navigate between a Rock and a Hard Place,"…

[39] Ibid.

[40] Andrea Shalal-Esa, "INTERVIEW-Navy's Winter sees progress on coastal ship program," Reuters, 2009; available from: http://www.forbes.com/feeds/reuters/2009/03/11/2009-03-11T220925Z_01_N11309472_RTRIDST_0_NAVY-WINTER-INTERVIEW.html; Internet; accessed 17 March 2009.

Shipyard Concept" [41] – a partnership between public and private yards, where resources and skilled labour would be shared, and processes, quality and schedules would become standardized.[42] For its part, the Navy would commit to a long-term, stable procurement plan capable of sustaining the naval sector. This concept is generally supported by the US Congress which has stated: "Overall recommendations for managing the capacity of the shipbuilding industrial base require a partnership between the Navy, Industry, and Congress…[43]" In an address to the Senate Armed Services Committee in 2006, a representative of the Rand Corporation, drew upon in-depth study of the naval sector in the UK to support the US move towards the "One Shipyard" partnership model. The study, based on the argument that competition is counterproductive to efficiency and specialization in a market with limited players, called for additional sector consolidation. Further, the study maintained that US shipyard reliance on domestic naval requirements for sector sustainment necessitated long term acquisition planning in order to provide stable demand to industry. [44] The US navy's desire for a single shipyard underscores a focus on capability maximization at reduced cost. This desire for reduced costs was recently echoed by a US navy design engineer who argued the US should consider the large cost-savings that could be made by having naval hulls built in Asian shipyards. He indicated that a

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[41]US Navy, Naval Sea Systems Command (NavSea), "One Shipyard for the Nation," in *Naval Forces Special Issue 2005*,available from http://www.nationalwritersgroup.com/pdfs/One_Shipyard.pdf; Internet; accessed 17 March 2009.

[42] Scott C Truver, and John Skovran, "U.S. Shipyards Navigate between a Rock and a Hard Place," …

[43] US Congress: FDCH Congressional Testimony, "Shipbuilding/Ship Repair Industrial Base Capacity," (Washington DC, 20 Mar 2007); available from http://web.ebscohost.com; Internet; accessed 6 January 2009.

[44] John F Schank, "Trends in the United Kingdom's Naval Shipbuilding Industrial Base: Lessons for the United States," available from http://www.globalsecurity.org/military/library/congress/2006_hr/060406-schank.pdf; Internet; accessed 30 January 2009, 7-9.

warship could be built at one-half of traditional costs if the hull was built in Asian shipyards, and all other aspects of warship construction were completed in US shipyards[45]. This call for further consolidation is not supported by industry and some politicians.[46] Additional consolidation would mean further loss of shipyards and jobs. Acknowledging that current capacity exceeds naval demand, rather than further consolidation, the shipbuilding industry in the US has been advocating an increase in demand and a long-term government shipbuilding plan.[47]

The United Kingdom

In a recent Defence White Paper titled The Defence Industrial Strategy, the UK affirmed the strategic importance of the naval shipbuilding and repair sector to support the UK's ability to globally project maritime forces in support of British interests. [48] Interestingly, in the same document, the government explicitly identified the skilled labour required to build, integrate and test ships as a strategic resource as well. It bears mention, that while a member of the EU, the UK remains distinctly separate from the other EU naval shipbuilding nations. This is due primarily to the general EU focus on foreign naval sales, an activity not currently practiced by the UK. While the UK has a very large naval shipbuilding sector and could conceivably

[45] Robert J. White, "Globalization of Navy Shipbuilding: A Key to Affordability for a New Maritime Strategy,"…, 67.

[46] Susan Collins, "Collins, Snowe Urge President-Elect Obama to Take Action in Support of Defense and Commercial Shipbuilding," *FDCH Press Releases* (12 Dec 2008); available from http://web.ebscohost.com; Internet; accessed 21 January 2009.

[47] Andrew Koch, "US Shipyards are 'in danger of being sunk'," *Jane's Defence Weekly* Vol. 42, no.11 (16 March 2005), 22.

[48] Britain, The Secretary of State for Defence, "Defence Industrial Strategy: Defence White Paper,"…, 7.

try to gain access to the same military export markets dominated by France and Germany, the UK does not build platforms suitable to that market,[49] where demand is for smaller, general purpose frigates. The Royal Navy relies more on larger, global projection capable ships. Consequently, much like the US, the national navy is currently the only customer for UK shipyards.

Similarly, one might ask why the UK does not build ships in continental shipyards. While this has not been a practice in the past due to the strategic importance of sustaining a national capability, the recent Defence White Paper indicates this may happen in future to a limited degree.

> In a change to the previously stated Defence Industrial Policy (DIP), there is no absolute sovereign requirement to construct all our warship hulls onshore. We have revised our approach which concentrated solely on hull construction, now to consider sovereignty of the highvalue capabilities needed for our operational independence…We need to build onshore to the extent that it sustains the ability to design and physically integrate complex warships. Furthermore, since warships are rarely prototyped, we need to ensure that we retain the ability to learn and adjust designs whilst the first of class is being built. Steel may be cut when the design is relatively incomplete compared to other military platforms; feedback during the production process is critical to ensuring that the platform meets the requirement as intended.[50]

The British government contends that the strategic value of a warship lies in the complexities of the integration and combat systems, not in the hull. Thus, the UK will build hulls in the British Isles when possible, but is prepared to have them built in other countries when necessary, continental shipyards being the obvious choice.

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[49] John Birkler, Denis Rushworth, James Chiesa, Hans Pung, Mark Arena, John Schank, "Differences Between Military and Commercial Shipbuilding: Implications for the United Kingdom's Ministry of Defence,"…, xvii.

[50] Britain, The Secretary of State for Defence,"Defence Industrial Strategy: Defence White Paper,"…, 70.

Note that this change in policy refers to the building of hull structures alone. Propulsion and combat systems, as well as systems integration shall be retained as a national asset.

Very similar to the US, the UK's shipbuilding industry has since the Second World War exited the international market for commercial ships and now relies almost solely on the Royal Navy for sector sustainment.[51] By 2006, UK shipbuilding companies had consolidated through natural market pressures and the sector was reduced to two major companies: BAE Systems; and, VT Group Shipbuilding. In addition, numerous small and medium specialty firms devoted to elements of the naval sector (system integration expertise, combat systems control software etc.) emerged due to the increasing specialization demands to building modern naval warships. This trend of separation between traditional shipbuilding (hull structure, and steering/propulsion systems, etc.) and naval systems integration has been observed in many countries. According to a recent British Defence White Paper, faced with a production surge due to the need for several new vessels, the British government expressed concern over the sector's capacity to meet the production surge, forecast to last until 2016. This concern was based on two factors: the capacity of British shipyards to satisfy the upsurge in hull-building requirements; and, the availability of specialized labour resources. As a result, the government explicitly called for the industry to undergo voluntary consolidation and rationalization in order to maximize skilled resources, gain efficiencies through

[51] John Birkler, Denis Rushworth, James Chiesa, Hans Pung, Mark Arena, John Schank, "Differences Between Military and Commercial Shipbuilding: Implications for the United Kingdom's Ministry of Defence,"…, iii.

reduction in process duplication, and increased commonality of standards and processes. Further, in a view to the future, the government also called for industry to extend this rationalization and consolidation process to supplies and services required for in-service support of naval platforms. While stating the government would leave it to industry to determine how consolidation and rationalization should occur, the British government also acknowledged that it should likely require consideration in the process as the industry's sole customer. In a new partnership approach, the government proposed development of a strategy that would promote sustainability, reduce cost to the government, and allow attractive profit for the industry. Toward that end, the government committed to a long term build program that would sustain the industry with platform contracts through to 2030.[52] From this solution it is clear the United Kingdom is determined to remain a sea power into the foreseeable future.

Australia

Given its relatively smaller size and limited budget, it may be surprising that Australia is grouped with the US and UK. The reason is quite simple. Australians view a strong navy as vital to their national interests. In its 2000 Defence White Paper, the Australian government stated, "The Government's objective is to have a sustainable and competitive defence industry base, with efficient, innovative and durable industries, able to support a technologically advance ADF [Australian

[52] Britain, The Secretary of State for Defence,"Defence Industrial Strategy: Defence White Paper,"…, 70-75.

Defence Force]."[53] To support this aspiration, the commonwealth government subsequently released a naval shipbuilding and repair sector strategic plan which explicitly states that the "Naval Shipbuilding and Repair (NSR) sector of the economy has key strategic importance to Australia."[54] A key element to keep in mind when considering Australia is that, as the only 'western' nation in an otherwise Asian region, where real threats exist to Australian sovereignty and security, defence is paramount to Australians.

Like most other nations outside Asia, once possessing a modest, but vibrant commercial shipbuilding industry, competition from Asian yards in the last half century forced Australia, for the most part, out of the commercial vessel market.[55] In response, Australia developed a niche market for specialty construction including naval vessels, ferry ships, and pleasure craft. Australia currently accounts for 25 percent of the world's international ferry market. In this way, Australia maintains a relatively vibrant national shipbuilding industry focused in key areas.[56] With some minor exceptions (New Zealand), naval sector production is for domestic consumption. By 2002, Australia had just completed extensive platform renewal for the Royal Australian Navy. Thus it was anticipated that government expenditures

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[53] Commonwealth of Australia, "Defence 2000: Our Future Defence Force," available from http://www.defence.gov.au/publications/wpaper2000.PDF; Internet, accessed 18 March 2009, XV.

[54] Commonwealth of Australia, Defence Materiel, "The Australian Naval Shipbuilding and Repair Sector Strategic Plan," available from http://www.defence.gov.au/dmo/msd/sectorplan.cfm; Internet; accessed 12 November 2008, 3.

[55] Australian Academy of Technological Sciences and Engineering, "Technology in Australia 1788-1988," available from http://www.austehc.unimelb.edu.au/tia/cover.html; Internet; accessed 18 March 2009, 517.

[56] Commonwealth of Australia, AusTrade. "Shipbuilding and Repair Overview," available from http://www.austrade.gov.au/Shipbuilding-repair-overview-/default.aspx; Internet; accessed 18 March 2008.

(including new builds, refit and maintenance) would be in the order of half what they had been over the previous decade. As such, it was anticipated there would be a tendency for natural attrition to occur within the sector. Natural attrition concerned the Australian government because this type of consolidation and attrition would make loss of key technical skills and capabilities inevitable.[57] In a responsive industry strategy plan, the Australian government proposed consolidation of the remaining sector entities into what it termed an "alliance entity" composed of the state-owned Australian Submarine Company (the current contract-holder for submarine in-service support) and a consolidated entity of the remaining private companies in the sector. As the sector's only customer, national defence would enter into a sole-source partnership with the alliance entity. By defence estimates, it was determined that based on a warship life of 20 years, staggering initial deliveries, eliminating the need for mid-life refits and simply replacing the vessels at the end of their lifespans, a fleet of 14 frigate-type ships could sustain a consolidated sector in a "rolling-build" program.[58] This Australian Rolling Build concept is radical, and a major departure from current practice in virtually every western naval country, where mid-life refits are common to most warship life-cycle planning. The significance of it, if estimates are accurate, is that capability is maintained through the life of a warship at lower cost than current practice allows.

These changes, while generally supported by government, have yet to be fully implemented. Subsequent to the issue of the Defence White Paper, the Australian

[57] Commonwealth of Australia, Defence Materiel, "The Australian Naval Shipbuilding and Repair Sector Strategic Plan,"…, 3-7.

[58] Ibid., 13.

Submarine Company (ASC) was privatized and has become the sole naval design authority in Australia.[59] As well, while the Naval Shipbuilding Sector Strategic Plan has been put into abeyance by government, the Australian naval shipbuilding has moved ahead on its own to begin implementation of the Alliance Entity called for in the plan. The issue was still a topic of government interest as recently as 2006, as indicated by an inquiry undertaken by the Defence and Trade References Committee of the Australian parliament.[60] Currently, four entities in the naval shipbuilding sector in Australia remain, and the government believes further rationalization and consolidation will be required in order to better match demand with capacity.[61] Finally, while the future is currently unclear with regards to a government/industry partnership, the 2006 inquiry report clearly underscores the need for a cooperative arrangement between defence and private builders. In addition, it outlines the requirement for "demand-smoothing" and for defence to provide a long-term building plan.[62] Based on this continued interest from the Australian government, and support from industry it can be assumed Australia will eventually migrate to a model resembling the partnership relationship called for in the original Defence White Paper.

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[59] ASC. "Improving the Cost-Effectiveness of Naval Shipbuilding in Australia," available from http://www.asc.com.au/cms_resources/documents/corporatecommunications/senate_inquiry.pdf. Internet; accessed 11 November 2008, 3.

[60] Commonwealth of Australia, Defence Materiel, "The Australian Naval Shipbuilding and Repair Sector Strategic Plan…, 1.

[61] Senate Foreign Affairs, Defence and Trade References Committee. "Australia's Naval Shipbuilding and Repair Industry," (25 August 2006), available from http://www.aph.gov.au/SENATE/committee/fadt_ctte/completed_inquiries/2004-07/shipping/dis_paper.pdf; Internet; accessed 18 March 2009, 4.

[62] Ibid., 13-17.

The Government/Industry Partnership Model

Informed by cultures of free-market sustainment and a natural tendency away from subsidization, the AUSUKUS nations were unable to rely on commercial shipbuilding as a means to sustain their respective national shipbuilding industries in the face of overwhelming competition from Asian shipyards. As opportunities for commercial contracts reduced in the latter part of the twentieth-century, natural market attrition created an environment of consolidation – the strong survived and the weak fell. Thus, the situation and effects are very similar to the European experience. However, as the European nations turned to cooperative transnational ventures to expand individual market potential rather than competing over diminishing market share, the AUSUKUS nations have migrated towards a partnership between government and remaining private entities. The reasons for this trend are not obvious, but probably not surprising either. The European trend towards pan-Europe amalgamation is understandable given common histories, cultures and relatively close geographical proximity. Further, it is a natural response in the interests of protecting their foreign naval markets from new competition expected to emanate from Russia, China and South Korea. Conversely, the United Kingdom's and Australia's island statuses, and North America's similar isolation leaves them with few neighbours with whom to amalgamate. However, is geographical isolation the sole reason for evolving differently from the EU? Clearly the solution for these countries had to be internal due to this isolation; however, the difference in approach is likely more attributed to motivation than geography. The AUSUKUS countries are motivated

more by national security interests than economic ones. Their solutions did have to be internal, but because it was of strategic importance for these nations to maintain a national naval shipbuilding and repair sector. It is this reason that best explains why the UK has not followed the same trend as its EU partners.

While not yet complete, common pressures are resulting in consolidation and migration towards a government/industry partnership to sustain their respective naval sectors. Consolidation is a common element between this model and the European one, but, as the name implies, this model is mostly based on a new type of relationship between government and its private contractor.

By necessity, a principal component of this model is the requirement for consolidation of the private entities into a single-entity. While a noteworthy trend, full national consolidation into a single industry entity is not a necessity for the European model. The reason the single-entity concept is vital to the partnership model lies in the basically non-competitive relationship inherent in a single-entity environment. This non-competitive environment is vital, as it is intended to remove contractor focus on profit, and government tendency to view contractors as adversarial. There is no question that a monopoly situation is created, with all of the risks that fact implies, namely: artificial inflation of costs, reduced motivation for innovation and improvement, and, fewer options available to government to address surge requirements.[63] However, as Australia has argued, these risks simply

[63] Commonwealth of Australia, Defence Materiel, "The Australian Naval Shipbuilding and Repair Sector Strategic Plan…, 128-129.

necessitate a comprehensive risk-mitigation strategy. They further argue, that while a single entity is the sole source available to government, it cannot be ignored that the world and domestic market situation is such that the government is the only customer available to the single entity.[64] In short, it is this mutual dependency, created by world markets, that makes this new relationship possible. This relationship, known formally as monopoly/monopsony is the critical characteristic of this model. While the industry entity enjoys a temporary monopoly situation, government, by virtue of its position as sole customer to the industry has the influence to employ monitoring and audit procedures designed to limit the scope of the monopoly. Further, Australia argues that this situation, rather than eliminating competition, actually serves to "shift and consolidate" competitive entities in the industry for temporary periods to address government needs.[65]

This *government/industry partnership model* acknowledges the natural trend toward consolidation, but seeks to involve government in how that consolidation will occur. The Australian Naval Shipbuilding and Repair Strategy contends that as the only customer available to the industry, the government had leverage that it was obligated to utilize in order to shape consolidation away from a non-competitive natural attrition to a consolidation of all industry players, whether public or private, in a coherent manner. This coherent approach, it argued, would ensure the best balance for all – lower costs to the government, a reasonable and satisfactory return to private

[64] Commonwealth of Australia, Defence Materiel, "The Australian Naval Shipbuilding and Repair Sector Strategic Plan…, 129.

[65] Ibid., 122.

industry, and most importantly, a sustained industry.[66] It should also be noted that a key benefit to this model is that risk is shared equally by both partners. This point is relevant when discussing the Canadian situation, because the transfer of risk from government to industry has been cited as a key factor in the failure of the recent Joint Support Ship contract.[67]

In summary, there are three principle elements that make up the *Government/Industry Partnership Sustainment Model*: sector rationalization/consolidation, government commitment to a long term shipbuilding plan, and industry commitment to quality, cost effectiveness and infrastructure investment. Further rationalization and consolidation of all public and private shipyards and workforce is necessary in order to: reduce duplication, maximize skilled resources where most required, leverage cost savings where it makes sense to do so, develop common standards and quality, and, balance the available demand. In short, match capacity to demand. Ultimately, a monopoly/monopsony relationship between government and industry is established. This relationship is formalized in some form of an exclusive contract between government and industry. For its part, government commits to a long-term shipbuilding plan upon which industry can rely for planning and revenue generation. In return, the industry entity commits to infrastructure-investment and a focus on maximizing capability against cost.

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[66] Commonwealth of Australia, Defence Materiel, "The Australian Naval Shipbuilding and Repair Sector Strategic Plan…, 3-13.

[67] Peter Cairns, "Thoughts on Building Government Ships," available from http://www.shipbuilding.ca/articles.shtml; Internet; accessed 3 December, 2008.

The *Government/Industry Partnership Sustainment Model* has evolved from nations whose national naval shipbuilding sectors, vital to maintaining a strong navy, were unable to sustain them effectively. As such, in contrast to the European one, this model is an internalized solution which allows these national sectors to be sustainable without any foreign reliance. For the United States, who wishes to maintain its status as a world superpower, this requirement is self-evident. For Australia, the issue is one of isolation and self-defence. In this context, a self-reliant sustainment model is as essential to Australia as it is to the US, albeit for different reasons. In contrast, the United Kingdom appears to be an anomaly in the group. Its membership in the EU, and its geographical proximity would suggest the UK should follow the European model, yet it chooses not to do so. In effect, on this issue, the UK chooses to isolate itself from Europe. In that respect there is a common element between these three nations. That common element being isolation: By necessity for the US, by choice for the UK and because it has no choice in Australia's case. This isolation is not borne of geographical isolation, but by a desire for self-reliance which stems from the need for strong national defence, and in the context of this discussion, for a strong, sustainable navy.

Therefore, the *Government/Industry Partnership Sustainment Model* is, in effect, a self-reliance model. This factor is significant when applied to Canada's situation. In contrast to Australia, Canada faces no real external threats. Similarly, Canada is not likely to become a world superpower. Therefore, for this model to

have applicability to Canada, the only other options available to Canada are geographical isolation and isolation by choice.

THE CANADIAN EXPERIENCE: SHIPBUILDING AND POLITICS

During the Second World War (1940-43) Canada produced large numbers of ships for the allied war effort. By the end of the war, possessing the third-largest navy in terms of numbers of ships, Canada was also in possession of the shipyards and workforce necessary to build it. Canada's wartime experience had resulted in a large emergency escort navy, the world's tenth-largest merchant fleet ill-suited for post-war markets, and a large shipbuilding infrastructure accustomed to mass-producing simple ship designs. By 1945, this relatively new industry was a significant national employer, but shrinking rapidly in the face of post-war downsizing. Disinterested in maintaining a shipbuilding capability, the Dominion government, under pressure to protect Canadian jobs, created the Canadian Maritime Commission (1947-1966).[68] Responsible "for developing policies to preserve the shipping industry, maintain Canada's shipyards, and coordinate naval shipbuilding programmes,"[69] the CMC relied on several government programs throughout the period of its mandate (1947-1966) to sustain Canadian shipyards through significant foreign competition and international market exclusion. Methods included tax incentives to promote new shipbuilding, a government allocation program to spread government requirements over numerous shipyards, vessel reconstruction assistance programs, and, government fleet rebuilding programs designed more to generate shipyard work than to address platform deficiencies in the government fleets.

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[68] Micheal A. Hennessey, "The Rise and Fall of a Canadian Maritime Policy, 1939-1965: A Study of Industry, Navalism, and the State," (University of New Brunswick, 1995), 1-4.

[69] Ibid., 5.

By 1953, almost 80 percent of work in Canadian shipyards was generated by government requirements as a result of Cold War rearmament.[70] Despite such indirect assistance from government and recurring debate over direct subsidization to address a worsening condition in the industry, the Canadian government was generally committed to free-market principles and opposed direct subsidization where possible. It was not until 1961, thirteen years after the CMC's creation, that mounting pressure from foreign protectionism and direct subsidization forced Canada's government into direct subsidization of shipyards to help sustain its national industry.[71] However, as Hennessey argues, subsidization hampered rationalization and consolidation by sustaining over-capacity and inefficiency, so the highly controversial subsidy was reduced from its initial 40 percent of builders cost to 25 percent in 1965,[72] and was terminated fully in the mid-1980's[73] in order to return to full free-market competition. Elimination of subsidization in the US occurred in the same period, which is perhaps not coincidence, given the implementation of the Canada-US Free Trade Agreement in January 1989.[74]

Despite the relatively coherent policy approach implemented by the CMC in the post-war period, the Canadian shipbuilding industry never achieved competitiveness on the international market and therefore relied solely on domestic

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[70] Micheal A. Hennessey, "The Rise and Fall of a Canadian Maritime Policy, 1939-1965: A Study of Industry, Navalism, and the State…,246.

[71] Ibid., 361.

[72] Ibid., 401-413.

[73] Canada, National Research Council, *Thinking Beyond Our Shoreline: Marine and Ocean Industry Technology Roadmap* (Ottawa: 11 February 2003), 16.

[74] Canada, "Free Trade Agreement: Eliminating Barriers to Trade," available from http://www.canadianeconomy.gc.ca/English/economy/1989economic.html; Internet; accessed 20 April 2009.

requirements. With the end of the merchant fleet by 1960, that reliance fell mostly onto naval requirements. However, the domestic naval market has never been able to sustain the number of shipyards available, resulting in inevitable natural attrition due to lack of economic viability. Canadian naval ship acquisition has never been consistent. Described as a "stuttering process" by Senator Colin Kenny,[75] naval ship programs until the present day were intermittent with large periods between, resulting in long lean periods for Canadian shipyards. Canadian naval shipbuilding programs through this period were separated by large inactive build periods.[76] Each inactive period resulting in market attrition that meant loss of infrastructure and more importantly, loss of skilled labour resources.

As ships became more complex in recent decades, the impact of the loss of a skilled resource pool has proven more significant. This "stuttering" methodology, according to a National Resource Council report, has never been capable of sustaining a viable national sector, and more importantly, "..our [naval] demand is so low as to make the periodic resurrection of this [military shipbuilding] capability economically impractical." Coupled with international pressures from Asian shipbuilders in the last few decades, and the resultant dependence of domestic markets around the world on national naval sectors, the prognosis for the Canadian naval sector is dire: "at present[2003], Canada has no military shipbuilding

[75] Senator Colin Kenney, "Canada's Navy Needs Ships. Canadian Workers Need Quality Jobs. Ottawa Should Connect The Dots…

[76] ST LAURENT/RESTIGOUCHE/MACKENZIE/ANNAPOLIS Class frigates (1950-1964), TRIBAL Class destroyers (1969-1973), the TRIBAL class Update Program (TRUMP, early-1980's), HALIFAX class frigate (1987-1996), and the Marine Coastal Defence Vessel (MCDV, late-1990's)[76]

capability."[77] That comment may perhaps be extreme, but its essence at least is supported by the Ruxted Group, which has stated that Canada's shipyards are currently unable to satisfy all of Canada's platform renewal requirements.[78]

Another Canadian naval shipbuilding experiment bears mention as it represents a significant departure from previous Canadian naval shipbuilding ventures, one more in keeping with European transnational experiences. In the mid-1980's, Canada together with France, Germany, Italy, the Netherlands, Spain, the UK and the US, entered into a transnational collaborative shipbuilding venture to design and build a new frigate. Called the NATO Frigate Replacement (NFR 90), the project concept was to build a common hull design and propulsion system. The participating nations could then fit combat systems in national shipyards in order to satisfy national requirements. The project was terminated in 1990, before actual construction began, due to difficulties in reaching consensus between nations on hull requirements.[79] While unsuccessful as a program, this development was significant by showing Canada's willingness to enter into transnational ventures along European model lines. Another interesting post-war anomaly to the Canadian naval shipbuilding

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[77] Canada, National Research Council, *Thinking Beyond Our Shoreline: Marine and Ocean Industry Technology Roadmap* …, 30.

[78] The Ruxted Group. "Far Distant Ships: Looking at the Future of Canada's Navy," available from http://sen.parl.gc.ca/ckenny/2008%20OPED%20-%20Citizen%20Ships.htm; Internet; accessed 19 March 2009.

[79] Norman Friedman, and D.A. Baker, "U.S. Destroyers, Revised Edition: An Illustrated Design History" (Naval Insitute Press, 2004), online excerpt available from http://books.google.ca/books?id=Tzp58htKLkEC&dq=us+destroyers&printsec=frontcover&source=bl&ots=PGTMGaE5zQ&sig=KGU05nFPWHPvqxZloYfGOzdE2J0&hl=en&ei=3IDPSZq_CKj1nQfY4NXHCQ&sa=X&oi=book_result&resnum=9&ct=result#PPA428,M1; Internet; accessed 28 March 2009, 428.

experience[80] was the purchase of four UPHOLDER Class submarines from the UK in 1998.[81] Thus over the course of it's naval shipbuilding history since the Second World War, Canada has built domestically, bought offshore, and attempted to collaborate in at least one transnational venture. This demonstrates a flexibility in its approach to naval shipbuilding that makes Canada difficult to categorize.

Several naval requirements need addressing in the near to mid-term: Joint Support Ship (3); Arctic Offshore Patrol Ship (3-6); and, Frigate/Destroyer Replacement Program (16), if current naval plans proceed. Canada has five major shipyards remaining.[82] Of these, only three have experience building naval ships since the Second World War.[83] Given these future requirements, the state of the shipbuilding industry in general, and the naval sector in particular, Canada is at a crossroads and faced with three renewal options: resurrect the naval sector, build in Canada using one of the two international models, or buy offshore. These options each present advantages and disadvantages when viewed in light of Canada's unique situation.

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[80] Prior to the Second World War, Canada routinely purchased second-hand British warships.

[81] CBC News: In Depth. "Canada's Submarines," available from http://www.cbc.ca/news/background/cdnsubs; Internet; accessed 29 March 2009.

[82] Kiewit Offshore Services (formerly Marystown Shipyard, Nfld); Halifax Shipyards (NS); Davie Yards Inc (formerly MIL-Davie, PQ); Seaway Marine and Industrial (formerly Canadian Shipbuilding and Engineering, PQ/ON); and, Washington Marine Group (BC).

[83] Commander (Ret'd) Ken Bowering, "Military/Naval Procurement in Canada: A Flawed process." *The Conference of Defence Associations Institute: General Sir Arthur Currie Paper 1-08;* available from http://www.cda-cdai.ca/Currie_Papers/Currie%20Paper%201-08%20Navy%20League.pdf. Internet; accessed 9 March 2009.

Buy Offshore?

The idea that Canada should buy naval ships off-shore is hardly mentioned, and even less supported among proponents of naval shipbuilding. The creation of the Royal Canadian Navy was a compromise by Sir Wilfrid Laurier's government aimed to quell Quebec opposition to sending money to Britain to support its naval arms race with Germany. The creation of the RCN necessitated the building of a fleet, and, to further gain support in Quebec, the government assisted in the establishment of Canadian Vickers Shipyard in Montreal in 1911.[84] From its earliest days, Canadian shipbuilding has been tied to votes and jobs. Canadian politicians would not likely consider the possibility of buying naval vessels offshore, except when absolutely necessary.[85] As one news source indicated "Can you imagine Defence Minister Peter MacKay having to announce in his home province of Nova Scotia that the JSS is being built in the Netherlands. That'll go over well."[86] Certainly, government policy until at least 2001 was that federal government vessels would be produced in Canada. That policy, while still alive in spirit, and definitely endorsed by industry[87] appears to have declined in status as formal government policy, as indicated in a statement by then Industry Minister Brian Tobin in 2001, "…and a Buy Canada policy for

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[84] Marc Milner, *Canada's Navy: The First Century*, (Toronto: University of Toronto Press, 1999) excerpt available from http://books.google.ca/books?id=hpDA5HxyqG4C&dq=laurier+compromise+RCN&source=gbs_summary_s&cad=0; Internet; accessed 20 April 2009.

[85] Canada does not have a national submarine building capability and has always, purchased submarines off-shore.

[86] Dave Pugliese, "DND Plans to Build Joint Support Ship Overseas Scuttled," *Ottawa Citizen* (8 November, 2008), [journal on-line]; available from http://communities.canada.com/ottawacitizen/blogs/defencewatch/archive/2008/08/11/dnd-plans-to-build-joint-support-ship-overseas-scuttled.aspx; Internet; accessed 22 April 2009.

[87] Peter Cairns, President, Shipbuilding Association of Canada, "Thoughts on Building Government Ships," http://www.shipbuilding.ca/articles.shtml; Internet; accessed 3 December 2008.

competitive federal procurements. On this last point, we have not concluded our deliberations; we will study the task force recommendations and federal procurement plans in more detail before concluding…"[88] This statement suggests that the Canadian government may not be as committed to buy in Canada as was the case previously. This sentiment was subsequently reinforced in a formal government response to industry's request for the Canadian government to re-affirm its commitment to a 'buy-in Canada' policy, the minister responded that the government of Canada would continue to procure and rely on the Canadian sector, only so long as it remained competitive.[89] Thus it appears the Canadian government is inclined to continue building vessels in Canada, but is willing to consider off-shore purchase when necessary.

Canada's naval sector if not completely gone is at the very least, seriously degraded. Canadian defence analysts recently commented on the state of Canada's naval shipbuilding sector: "Few things are more complex than building a naval vessel and most of the required workers left Canada long ago due to lack of stable employment."[90] Given the state of the sector in Canada, there is a strong argument that Canada may no longer be capable of building naval ships, at least not without difficulty. Certainly, Canada has done it many times in the past, but that was always

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[88] Canada, Industry Canada, "A New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry: Focusing on Opportunities 2001," available from http://strategis.ic.gc.ca/shipbuilding; Internet; accessed 20 March 2009, IV.

[89] Ibid., 17.

[90] Patrick Lennox; Aaron Plamondon, "Canada's Navy: Build ship's, be heard," *National Post*, (January 8, 2009), [journal on-line]; available from http://network.nationalpost.com/np/blogs/fullcomment/archive/2009/01/08/canada-s-navy-build-ships-be-heard.aspx; Internet; accessed 9 March 2009.

when there was a war to focus motivation and need. Peter Cairns, President of the Canadian Shipbuilding Association, would challenge this statement given his comments in 2006. He stated that the Canadian shipbuilding industry has been in such straits in the past, and has always risen to meet naval building demands. He contends the industry, while it might be severely challenged, is capable of meeting current platforms demands.[91] However Cairns may be disregarding the complexity of modern warships. If Canada does build more warships, the cost will be extremely high in order to renew and replace aging infrastructure and to secure new expertise. Australia's experience developing the Collins Class submarine has been cited as a reasonable level design complexity for an inexperienced middle power nation to aspire to design, develop and build.[92] Canadian expertise developed during the HALIFAX Class project in the 1990s has dwindled. The same article claims that the Joint Support Ship, being more complex, and unlike any other vessel in the world would be too much for Canada to attempt.[93] There is little question, that the design effort alone to create a new type of ship like the JSS, without an existing expertise and infrastructure would be a significant and costly undertaking, with huge potential risk. Given this, arguments to reduce cost and risk by purchasing existing ships from other navy's, thus avoiding new build, and design costs, have some merit.[94] Similar conclusions were drawn in a post-analysis of the Canadian Patrol Frigate (CPF) project by the Canadian government Chief of Review Services in 1999, where it was

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[91] Cairns, Vice Admiral (Ret'd) Peter. "Shipbuilding and Industrial Preparedness." *Canadian Naval Review* 3,no.2 (Fall, 2006), 16-23.

[92] "Canada's C$ 2.9B "Joint Support Ship" Project Sinks," *Defence Industry Daily*, (26 August, 2008). [journal on-line]; available from http://www.defenseindustrydaily.com/canada-issues-rfp-for-cdn-29b-joint-support-ship-project-updated-02392/; Internet; accessed 9 March 2009.

[93] Ibid.

[94] Ibid.

determined that the vessels could have been acquired more quickly and cheaper from the international market citing that savings in infrastructure and training alone would have been significant.[95] While the point is valid, this argument does not account for the regional employment generated through the life of the project. As noted from the Laurier experience in 1911, for Canada, job creation is a major consideration in naval acquisition programs, perhaps even at higher cost.

Notwithstanding, a 'buy-offshore' option is largely a political non-starter because, in Canada, building ships means jobs. Jobs translate to a stronger more vital economy, and the economy and political influence so gained is the Canadian government's primary motivation. Given the financial meltdown of 2008-9, building naval ships figured prominently in proposals to stimulate the economy. Lennox and Plamondon argued that initiating naval build programs in the short term, and establishing an "all-parties agreement to keep up a continuous shipbuilding program in the long term" would offset current job losses in the manufacturing sector.[96] This position speaks to the general Canadian labour view that shipbuilding in Canada has the potential to employ large numbers of people.[97] Finally, without work, what remains of Canadian shipyards will disappear with time. An indication of the true state of shipbuilding in Canada was the relief when Halifax Shipyards was recently awarded a new contract to build a new offshore supply vessel. Prior to that

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[95] 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), 3.

[96] Patrick Lennox; Aaron Plamondon, "Canada's Navy: Build ship's, be heard…

[97] Canadian Auto Workers Union, "Build Ships for Canada in Canadian Shipyards, Tories Told," http://www.caw.ca/en/5383.htm; Internet; accessed 19 March 2009.

announcement, the shipbuilder had already intended to lay off workers the next month because the only active private contract was about to end.[98] Thus some persons associated with the industry have argued, it is the role of government to ensure government requirements generate work for Canadian industry.[99] Certainly this argument corresponds in some measure with past policies under the former Canadian Maritime Commission. At least one industry analyst in regard to the government's decision to build the proposed Joint Support Ship in Canada identified the main imperative: "At the root of the government's decision to build domestically is the number of jobs that will be created."[100] Referring to the HALIFAX Class Project, he also points out that, in addition to the direct benefits created from employment, a domestic building program results in indirect benefits in the form of increased regional spending and spin-offs. However, the same analyst cautions that while several regional employment benefits were incurred during the CPF Project, substantial costs to the federal government were incurred in the aftermath of the project which should also be taken into account when considering the question of domestic or international shipbuilding. Specifically, he cites the money that government provided to the contractors to assist with shut-down costs and worker placement, when yards were unable to sustain themselves with other (non-government) contracts.[101]

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[98] "Halifax shipyard wins Encana contract to build offshore supply vessel ," *Daily Commercial News*, (17 March 2009), [journal on-line]; available from http://www.dailycommercialnews.com/article/id33032; Internet; accessed 24 March 2009.

[99] Stephen Priestly, "National Defence and Strategic Industries: Military Capability Backed Up By Industrial Capacity," http://www.casr.ca/id-shipbuild1.htm; Internet; accessed 19 March 2009.

[100] Ty Curran, "The Single Shipbuilding Entity Model in Canadian Naval Procurement…, 2.

[101] Ty Curran, "The Single Shipbuilding Entity Model in Canadian Naval Procurement…, 3.

The major advantage to buying naval ships offshore is expected cost savings (manifested through reduced program risk, elimination of development and design costs, and elimination of the need to replace existing infrastructure). On the opposite side is the negative impact that buying offshore would have on the shipbuilding industry in general, and worker jobs specifically. The solution might therefore be in a compromise between the two positions. The UK, and US have acknowledged that there is no particularly strategic requirement to build ship hulls in their respective countries.[102] They argue that the true strategic aspect of a warship lies in the highly technical, integration, electronics and combat systems requirements. As one US naval engineer has indicated, a warship can be built at one-half of traditional costs if the hull is built in Asian shipyards, and all other aspects of warship construction are done in US shipyards.[103] The benefits of this approach are multiple. First, significant cost savings could be achieved by virtue of building the hulls in Asia. Second, the higher-paying, more strategic highly-skilled technical jobs are retained in the national entity. The net effect is a highly-specialized and skilled workforce, functioning in a potentially vibrant and sustainable national naval sector. Added benefits include hull standardization and potentially lower infrastructure costs (fewer cranes and drydock facilities required). Thus, while not necessarily in keeping with past practice, significant reasons exist why buying naval vessels offshore might be appropriate to Canada. Several difficulties would have to be overcome before Canada could embark on such an endeavor however. First and foremost, the political situation in Canada is

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[102]Britain, The Secretary of State for Defence, "Defence Industrial Strategy: Defence White Paper…, 70.

[103] Robert J. White, "Globalization of Navy Shipbuilding: A Key to Affordability for a New Maritime Strategy…

such that shipbuilding has traditionally been viewed as a ‘nation-building’ activity employing significant numbers of workers. Building ships in Canada means creating and sustaining jobs in the regions of Canada. As such, the political viability of purchasing outside Canada is low. Nonetheless, adopting strategies such as building hulls offshore and relying on a national sector for the more complex and highly technical integration of combat and propulsion systems, requiring highly-paid and skilled workers, could mitigate this political difficulty.

The Government/Industry Partnership Sustainment Model Applicability to Canada

Canada is closely related to the AUSUKUS nations by history, culture, and natural affiliation. Coming from a culture of free-market sustainment and a natural tendency away from subsidization, the shipbuilding industry in Canada, as in other AUSUKUS nations, has never been able to compete on the international commercial shipbuilding market. Correspondingly the naval sector in Canada has by necessity been forced to rely on government contracts to sustain itself – the navy being the primary customer. In short, Canada has a similar background and is faced, simplistically speaking, with the same difficulties of sustaining of a national sector. The other AUSUKUS nations have been migrating towards a partnership with government and their remaining national sector entities. The reasons for this trend, it was suggested, might have been due to geographical isolation as compared to the European nations. This same factor would apply to Canada, who, along with the US,

shares the relatively isolated North American continent. Hence, if geographical isolation is a valid factor, then like the other AUSUKUS nations, Canada must find a sustainment solution internally. The *Government/Industry Partnership Model* is such an internal solution. A likely more significant factor is the relationship between government and industry that is necessary to support this model. As previously stated, at the heart of the model is the premise that mutual need created by a sole contractor/sole customer situation creates an environment of mutual cooperation and shared risk. This monopoly/monopsony relationship creates a new partnership relationship between industry and government. For the model to be applicable to Canada therefore, such a relationship must be appropriate for the Canadian context.

The naval shipbuilding sector in Canada is in dire straits. If not non-existent, as proclaimed by some sources, it is at least almost so.[104] Ship repair has traditionally been the mainstay of the Canadian industry since the completion of the Canadian Patrol Frigate project in 1995. Canadian shipbuilders have indicated the industry is struggling, but alive in Canada, subsisting on government vessel refits and building smaller niche vessels for the international market. However, naval ship-refitting is not the same as naval shipbuilding. As a recent Rand report on the UK industry indicated, there are significant differences in terms of knowledge base, skills and infrastructure between commercial and naval shipbuilding. [105] More to the point, modern naval shipbuilding is specialized, and its characteristics are very different

[104] Michael Hennessey, "Canadian Shipbuilding: Some Lessons Observed, If Not Learned." *Canadian Naval Review*, 4,no.3 (Fall 2008), 24.

[105] Rand Europe, *Diversifying the Customer Base for Shipbuilding in the United Kingdom*, available from http://www.rand.org/pubs/research_briefs/2005/RAND_RB9117.pdf; Internet; accessed 30 January, 2009.

when compared to commercial shipbuilding. The differences between commercial and military shipbuilding lay in the areas of complexity, design, construction, and workforce character. Commercial vessels, described as steel boxes, are much simpler to build than military ships which have many complicated systems not found on commercial vessels, and significantly more complex propulsion arrangements. The military ship acquisition process (including contracting, design, construction and testing processes) is significantly more onerous, complicated and time intensive than commercial practices, requiring specialized expertise and experience. As well, issues such as high equipment density, stealth technologies and availability/reliability requirements necessitates the use of exotic materials, more complicated fabrication techniques, integration of electronic systems, and more stringent standards and testing than is necessary for commercial ship. Finally, for all of the reasons just described, military shipbuilding requires a highly-specialized workforce characterized by a higher ratio of white-collar to blue collar workers, larger numbers of engineers, and specialized workers (specialty welding etc.) when compared to commercial requirements.[106] Of these factors, design, construction and workforce are the most significant when assessing Canada's current ability to build warships. The long period since Canada's last major naval ship acquisition means that the skills and workforce necessary to initiate a new program would have to be resurrected from offshore. This problem is not insurmountable, but significant enough that a national industry would be challenged to create or resurrect a naval sector from the existing commercial one.

[106] John Birkler, Denis Rushworth, James Chiesa, Hans Pung, Mark Arena, John Schank, "Differences Between Military and Commercial Shipbuilding: Implications for the United Kingdom's Ministry of Defence …,XV.

As several sources have indicated any new naval build in Canada would necessitate new infrastructure, reconstitution of a skilled labour pool, and regeneration of a warship design capability.[107] This position is supported by Canada's experience at the start of the CPF Project. Canadian industries ability to do all of these things cannot be discounted. They have done it in the past, and could likely do so again, albeit at increased cost to the government. In addition, some risk can be mitigated. For example, Canada could rely on existing designs, instead of generating completely new ones.

Acknowledging that a naval shipbuilding capability could be reconstituted, the fact remains that reconstitution would be required. This is important, because reconstitution will likely tax the resources remaining in the Canadian industry. Recall that a key element of the *Government/Industry Partnership Sustainment Model* is the monopsony/monopoly relationship between government and a single industry entity. While five major shipbuilding companies remain in Canada, the reconstitution of a naval sector will require resources from more than one company, undoubtedly resulting in mergers and partnerships. Once a contract is awarded, it is probable there would remain but one single industry entity capable of building a naval ship. In effect, while the contract was in place, a monopoly/monopsony relationship would exist. The current situation with the Frigate Life Extension (FELEX) Project is a case in point. Although this is no more than a class-wide mid-life refit, it involves two major shipyards and a large proportion of Canada's naval systems integration firms

[107] "Canada's C$ 2.9B "Joint Support Ship" Project Sinks…

engaged in full-time activity until 2017.[108] Arguably therefore, the Canadian situation is such that the conditions necessary for a monopoly/monopsony environment may already have been achieved.

The partnership model calls for further rationalization and consolidation of all public and private shipyards in order to achieve efficiency gains and maximize national capability. The US, UK and Australian proposals go so far as to include in-service maintenance and refit. Recall, that for the US, this even included naval shipyards in the consolidation process.[109] If true, there would still be a requirement for some consolidation in Canada in order to incorporate a refit and in-service support capability into the singularized-entity. The $900M Multi-ship Refit contracts awarded to Halifax Shipyards and Victoria Shipyards in 2008 effectively achieves that consolidation. These shipyards will conduct refit and repair for the twelve HALIFAX Class frigates until 2020.[110] Given this contract and the likelihood that a new shipbuilding program in Canada would result in the partnering/merging of individual shipyards, the monopoly/monopsony environment called for in the model is already close to reality in Canada. In essence, what has been transpiring in Canada for the last decade is very similar to the consolidation process called for in the UK and Australia. Australia maintains that this kind of consolidation can be accomplished by government presenting its requirements to industry, and leaving it to

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[108] Victoria Shipyard (Washington Group), Halifax Shipyards and the Lockheed-Martin Group (includes Lockheed-Martin Canada, L-3, SAAB, IBM Canada, XWave, and CAE).

[109] US Navy, Naval Sea Systems Command (NavSea), "One Shipyard for the Nation…

[110] Canada, "The Government of Canada Announces refit of Navy Frigates," available from http://news.gc.ca/web/article-eng.do?crtr.sj1D=&mthd=tp&crtr.mnthndVl=&nid=393239; Internet; accessed 20 April 2009.

industry to re-structure as appropriate.[111] The UK takes a similar position.[112] The Canadian experience holds with those positions.

Another key element of the partnership model is the requirement for government to adopt and commit to a long-term strategic [naval shipbuilding] plan. Arguably, the Canada First Defence Plan (CFDP) already satisfies this requirement. However the CFDP is only a partial fulfillment of the requirement. The naval requirements identified in "Canada First" are inadequate to sustain a sector in the long term.[113] In addition to platform numbers, there needs to be some sort of continuous build program that will ensure fulltime employment of the shipbuilding entity and its workforce and avoid the recurring costs of facility startup and shutdowns that have become the hallmark of naval acquisition in Canada.[114] Periodic fleet renewal, 'batch-builds', has meant that large numbers of workers were employed for only as long as the life of the current shipbuilding program. As already noted, the periods of inactivity between these programs were often lengthy. Given this Canadian experience, transition to a continuous build process would likely be a challenge in Canada, but there is a desire to attempt it as most recently expressed by the current Chief of the Defence Staff, General Natynczyk.[115] Further, the current state of the federal fleet is such that a great deal of renewal is required, not just in the

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[111] Commonwealth of Australia, Defence Materiel, "The Australian Naval Shipbuilding and Repair Sector Strategic Plan…, 109.

[112] Britain, The Secretary of State for Defence, "Defence Industrial Strategy: Defence White Paper…, 74-75.

[113] Ty Curran, "The Single Shipbuilding Entity Model in Canadian Naval Procurement…, 9.

[114] Cairns, Peter, President, Shipbuilding Association of Canada, "Learning Our Lessons…

[115] David Pugliese, "In Canada, Collapse of Ship Effort Spurs Review," *Defence News, 12 January 2009* [journal on-line]; available from http://www.defensenews.com/story.php?i=3899957; Internet; accessed 19 January, 2009.

navy, but also the Department of Fisheries, the Coast Guard, and the RCMP. When fully accounted, one source estimates the Canadian government needs to build over 133 new vessels of various types over the next 25 years, in order to satisfy its current 'fleet' renewal and upgrade requirements. [116] A formal analysis of the industry would need to be done, but it is expected this level of requirement should be adequate to sustain a continuous build process in the naval sector. In addition, if Canada were to adopt the "rolling-build" concept proposed by Australian analysts, several economies of scale could be realized in addition to an assurance of build requirements in the long-term.[117] While extremely interesting, and perhaps even desirable, a continuous build process may be a political non-starter in Canada, if only because such a long-term commitment might limit future options available to government.[118]

Canada shares a common background and shipbuilding heritage with Australia, the US and the UK. Similarly, the modern challenges faced by the naval sectors in Canada and the AUSUKUS nations are similar. Canada's traditional dependence on free-market sustainment and general unwillingness to rely on direct subsidization like other nations means the shipbuilding industry must rely upon Canadian government contracts – primarily naval requirements. In contrast to the AUSUKUS countries however, no permanent naval shipbuilding takes place in Canada. While the naval sectors in the other countries suffer boom and bust cycles in

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[116] Senator Colin Kenney, "Canada's Navy Needs Ships. Canadian Workers Need Quality Jobs. Ottawa Should Connect The Dots…

[117] Commander (Ret'd) Ken Bowering, "Military/Naval Procurement in Canada…

[118] John M Treddenick, "Distributing the Defence Budget: Choosing between capital and Manpower," *Issues in Defence Management*, (edited by Douglas L Bland, Queen's University Press, 1998), 57-82.

synchronization with intermittent naval building programs, this intermittent nature is not so prolonged that their sectors cannot survive. By contrast, the extended period between naval building programs in Canada means that the shipbuilding sector must also rely on other non-naval business to sustain itself. What this means therefore, is that in Canada, a naval sector is reconstituted for each new naval building program. Thus, while similar to Australia, the UK, and the US, the naval shipbuilding sector in Canada is also distinctly different.

Interestingly, it is this difference which makes Canada more like the 'AUSUKUS' group than the European nations. The need to reconstitute periodically for naval building programs, means that the key factor required for the government/industry model to be viable exists by default in Canada. Any new build in Canada is effectively a single-entity, non-competitive monopoly/monopsony environment by virtue of the fact that the naval shipbuilding entity essentially creates itself for each project. Thus, the Canadian situation is such that the key requirement to sustain the model that the AUSUKUS group is migrating towards is the defacto reality in Canada today, creating a situation where Canada could easily migrate to the same model. Finally, by virtue of expected government fleet requirements, enough business is anticipated to sustain a new naval shipbuilding sector for the next 25 years. This business would allow the government to commit to a long-term relationship with industry in the manner prescribed by the model. In short, the *Government/Industry Partnership Sustainment Model* is viable, and arguably may be the most appropriate to Canada.

The Transnational Sustainment Model Applicability to Canada

Comparing the European experience to Canada's, it seems unlikely that there are sufficient commonalities to warrant serious comparison and application to Canada. The European maritime nations, each with a long history of building ships and shipbuilding industries that were a major component of their respective national economies are in stark contrast to Canada. Canada's history following the Second World War may have indicated a desire on the part of government to sustain shipyard jobs; however, the international realities were such that sustaining post-war shipbuilding was a temporary, anomalous condition. The period since World War Two has been marked by steady decline and struggle to sustain the industry on even a marginal level. Like the Europeans, Canada may have gone through a period of direct subsidization of its shipbuilding industry, but in Canada this policy was controversial and considered temporary, eventually to terminate. Fundamentally, Canada espouses free-market sustainment, and subsidization runs directly contrary to these principles. Thus, direct subsidization ended two decades earlier than in Europe. In short, the Canadian shipbuilding industry has never really been of the same order as, nor been similar in nature to, the industry in Europe. Additionally, government statements over the years make clear that naval shipbuilding is vital to sustaining the strategic asset that is Canada's navy. In 2007 Defence Minister, Peter MacKay, expressed: "Canada is a maritime nation, and a viable shipbuilding industry supports

our security and our sovereignty." [119] Given such declared sentiments from political leaders, Canada falls squarely into the AUSUKUS group which views a national naval sector as a strategic asset, unlike the European group which focuses more on economic priorities.

However, it would be premature to dismiss the European *Transnational Sustainment Model* as a viable option for Canada simply because of differing histories and priorities. In fact the transnational nature of the model may well have very strong applicability to Canada for several reasons. Globalization reduces the impact of geography, but Canada's obvious potential partner in a transnational relationship would be the US. Interoperability with allies in general, and the US in particular, is a stated policy goal in Canada's most recent Defence White Paper and underpins Canadian defence strategy.[120] Further, a long history of cooperative/collective defence in North America through NORAD, and more specifically with the US Navy, makes a cooperative shipbuilding program with the US seem logical. To date, such a relationship has not been seriously pursued primarily because federal policies in both countries require naval vessels to be built domestically. Arguably, policies could be changed with political will on both sides of the border; however, no real incentive exists to enter into a cooperative shipbuilding relationship between Canada and the US. From the US perspective at least, its status as the world superpower necessitates

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[119] Canada, Industry Canada, "Canada's New Government Announces Renewed Federal Shipbuilding Approach," available from http://www.ic.gc.ca/eic/site/ic1.nsf/eng/02106.html; Internet; accessed 24 March 2009.

[120] Canada, Department of National Defence, "Canada's International Policy Statement: A Role of Pride and Influence in the World," available from http://www.forces.gc.ca/admpol/newsite/downloads/Canada_Defence_2005.pdf; Internet; accessed 27 March 2009, 9-11.

a self-reliance that would fly in the face of such an arrangement. Further, this model is aimed at creating conditions which enable the partners to compete internationally for naval contracts. Unlike the European nations, neither Canada nor the US have ever been in that position, nor are they likely to do so. Arguably, becoming competitive internationally would make sustainment of a national sector more viable in Canada; however, the market situation in the US is such that domestic demand is already marginally adequate for industry sustainment. Additionally, such change in policy would run counter to the US Navy's desire for "One Shipyard". Given these factors, it is unlikely for the foreseeable future the US would enter into any such relationship with Canada. Therefore, while a cooperative transnational program with the US would be beneficial to Canada, such a relationship runs counter to their common backgrounds, and more to the point counter to US interests.

Does Canada Want a Sustainable National Naval Shipbuilding Sector?

At first glance, Canada's situation appears very similar to Australia's: Its current acquisition policies are similar to Australia's prior to its transformation, naval defense requirements are of similar scope, and both countries face similar budget limitations. As a result, the natural inclination would be to assume the Australian experience has special significance to Canada. More to the point, one might assume that a ship building solution that works for Australia, should also work for Canada. However, the impact of geography on the defensive postures of Canada and Australia cannot be over-estimated. Australia faced with real external threats thereby thereby

making defence paramount. In contrast, by virtue of its geographical closeness to the United States, Canada does not face any direct external threat. Without a definitive need to concern itself with national defence, Canada's internal priorities have traditionally focused on the economy, nation-building, inter-provincial relations and social programs. Defence has focused on North America, and, given friendly relations with the United States, Canada has been able to limit its defence programs to the minimum necessary to satisfy the United States that Canada remains a valid North American partner. In short, Australia's sense of isolation and need for security creates a motivational element to sustain defence industries that does not apparently exist in Canada. Canada's motivations must be understood in this context.

Given the various options available to Canada, any or all could be applied in some fashion or another. This same dichotomy seems to exist in Canada's motivations. Of the maritime nations that sustain a naval sector, there are those who do so to sustain a strategic asset, and the remainder do so to sustain an important element of their economy. Canada does not fit neatly into either group. In some cases economics drove national policy, while in others, security and defence took priority over economics. How might Canada then apply the lessons learned from the other nations? The answer lies in the contradictions. Canada's history indicates that while Canada has generally followed the same trends as the AUSUKUS group, sometimes Canada was willing to buy offshore, and at other times also displayed a willingness to enter into collaborative naval shipbuilding ventures. If there is a finite number of international solutions, and none apply exclusively to Canada, but all have

some degree of relevance, then all must apply to varying degrees at different times or different circumstances. Thus to apply the solution of any particular group to Canada would be inappropriate. The answer therefore, is to consolidate the relevant solutions of each group into a uniquely Canadian hybrid. Specifically, Canada needs to have a model that allows it to sustain a naval sector capable of supporting a strategic asset, but in a manner consistent with Canada's internal focus of sustaining jobs in a strong economy. This model also needs to provide Canada the flexibility to buy offshore when suitable to do so. Thus the Canadian model, while intended to maximize capability at minimum cost, must be permit the government some flexibility to make decisions in the interest of jobs, or defence priorities as appropriate to the situation. The elements of this model exist as components of those practiced in the rest of the world.

When asked by industry to formalize the strategic importance of shipbuilding to Canada in 2001, the Canadian government responded: "The Canadian shipbuilding…industry is recognized by the government as an important contributor to national and regional economies…[and]…a viable…domestic ship maintenance and repair capability is important to Canadian government operational needs."[121] This statement is illuminating in that the government explicitly identifies both the economic importance of the shipbuilding industry and also its role in support of the government's strategic capabilities. For Canada, both elements are important, neither to the exclusion of the other. The strategic importance of a viable shipbuilding

[121] Canada, Industry Canada, "A New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry: Focusing on Opportunities 2001…,17.

industry was further reinforced by Defence Minister Mackay in 2007: "…a viable shipbuilding industry supports our security and our sovereignty."[122] Given these recent statements, it can be concluded the Canadian government considers a sustainable shipbuilding industry important to Canada's economy, and supporting its national interests. In that light it can further be concluded Canada desires a sustainable shipbuilding industry.

There is also a significant omission in the government's statements. Note that both statements refer to a national shipbuilding industry. They do not explicitly identify a naval shipbuilding sector. It might be inferred that Canada desires a shipbuilding industry capable of building naval ships for strategic purposes. However, it is in this inference that many of Canada's naval shipbuilding problems emanate. Recall one of the lessons learned from the international experience: Naval shipbuilding is distinctly different from commercial shipbuilding. It is extremely challenging for commercial shipyards to engage in naval shipbuilding. Therefore, naval shipbuilding sectors generally exist as a separate entity within the national shipbuilding industry. In fact there are few successful examples of combined commercial/military shipyards. Government statements rarely address this distinction which explains in part why naval shipbuilding in Canada has been a "stuttering process", requiring resurrection of a naval sector capability each time Canada embarks on a new naval shipbuilding venture. It appears that the Canadian government, despite experience to the contrary from the international community, is

[122] Canada, Industry Canada, "Canada's New Government Announces Renewed Federal Shipbuilding Approach," http://www.ic.gc.ca/eic/site/ic1.nsf/eng/02106.html; Internet; accessed 24 March 2009.

under the assumption that a healthy shipbuilding industry is capable of building naval ships. This is reasonable for simpler vessels, but not for sophisticated warships. For sophisticated warships the government's assumption is only correct if the shipbuilding industry also contains an existing naval sector. Similarly, a naval shipbuilding sector is not one whose main activity is naval repair and refit. It is this element that Canada has not grasped, thus necessitating the costly periodic resurrection of this capability. Judging by past naval shipbuilding programs, it appears the Canadian government is willing to absorb this cost as an alternative to the cost of fulltime sustainment of a naval sector.

A number of advantages could be gained by purchasing federal vessels offshore if cost is the overriding factor. However, as suggested, the offshore purchase of federal fleet requirements is politically untenable, due to its negative impact on jobs and the economy. It is interesting to note that in the 2001 industry white paper, Brian Tobin, specifically did not exclude the possibility of purchasing federal ships offshore. When asked to re-commit to the policy of "procuring, refitting and overhauling in Canada", Tobin remained non-committal: "The federal government will continue to procure, repair and refit vessels in Canada subject to operational requirements, and the continuance of a competitive domestic marketplace."[123] This statement is significant in that the government effectively retained the right to buy offshore if the situation warranted. As current Canadian policy, this statement underscores the Canadian Government's true intent, consistent with its history.

[123] Canada, Industry Canada, "A New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry: Focusing on Opportunities 2001…,17.

Canada will build, refurbish and refit federal ships domestically, but when necessary will pursue other options, including such options as purchasing vessels offshore and collaborative building ventures. So how can this be accomplished?

The Canadian Model

The Canadian experience has been marked by the typical AUSUKUS experience, with experimental, anomalous forays into transnational cooperation and offshore purchases. In keeping with current policy, the government clearly wishes to retain the flexibility to continue with the same approach. Hence, a Canadian model needs to incorporate this flexibility in order to be viable. Additionally, to be more readily accepted, a Canadian model would need to conform as much as possible to current naval acquisition policies. Finally, it would be remiss, while defining such a model to ignore the rest of the international community. It is within these constraints, that the following *Canadian Naval Sector Sustainment Model* appears most appropriate.

Based upon the experiences of other nations, it can be concluded that free-market sustainment of the shipbuilding industry in Canada is not viable in today's environment without domestic federal fleet requirements to sustain itself. Further, Naval shipbuilding is distinctly different from commercial shipbuilding making it challenging and expensive for commercial shipyards to resurrect a naval shipbuilding capability without incurring high costs. Canada therefore has two choices: continue

absorbing the cost of periodic re-generation of a naval shipbuilding capability within naval shipbuilding project costs, or sustain a separate naval shipbuilding sector in Canada where the specialized infrastructure, workforce and design capabilities required for naval shipbuilding can be concentrated and retained. This approach requires a continuous build process to sustain the naval sector, and may necessitate further rationalization of the industry.

Given these Canadian realities, the *Government/Industry Partnership Sustainment Model* holds more validity to Canada than the *Transnational Sustainment Model* as it is an internalized solution more in keeping with Canada's apparent desire for flexibility. However, as already noted, this model in and of itself, does not present the degree of flexibility assumed necessary based on Canada's past experiences. To address this need, it is worthwhile to examine Ross's Risk Transfer Model which may provide some insight into how additional flexibility might be achieved.[124]

[124] 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 27 March 2009.

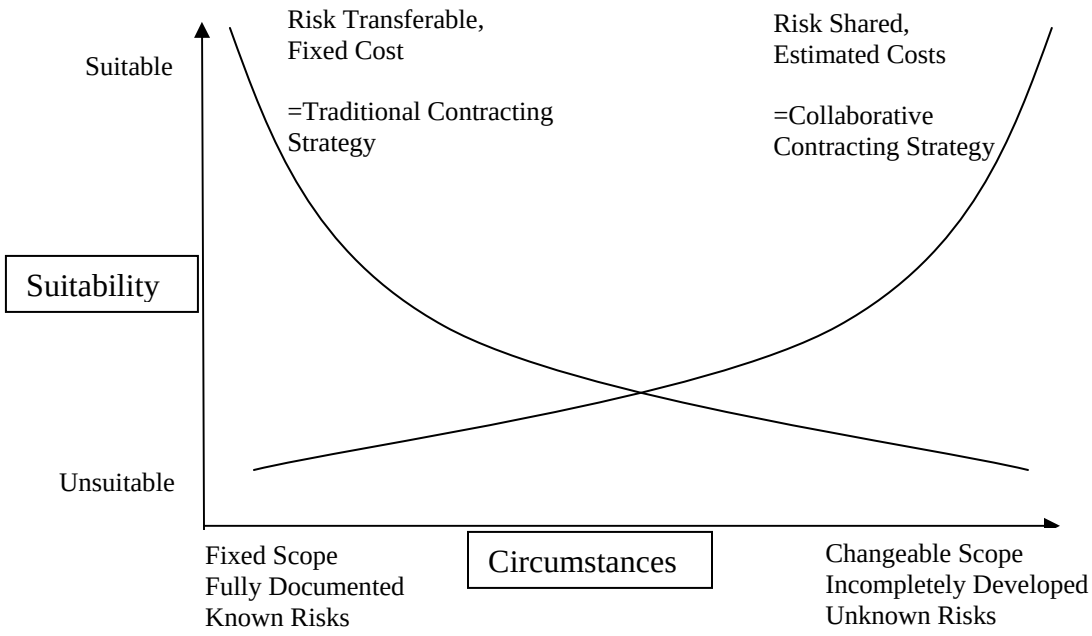

Figure 1- Risk Transfer Model

This model indicates that for projects of known scope, design and risk, traditional contracting strategies apply. Conversely, for projects involving new design where the risks and scope have yet to be determined, a collaborative contracting strategy is more appropriate. Ross uses this model to promote a concept called "Alliance Contracting", which as the name implies is very closely related in concept to the Partnership Sustainment Model. For complex projects such as a new warship program, Ross would suggest that the Partnership Model would work best. Conversely, for a less complex, straightforward acquisition such as an offshore buy of an existing platform, traditional contracting methods would be more appropriate. Thus, the solution to the flexibility requirement for Canada lies in the flexibility called for in the model. For Canada's purposes, a flexible contracting methodology

that would support a *Government/Industry Partnership Sustainment Model* as the usual contracting mechanism for new warship acquisitions while allowing more traditional fixed-price/scope projects where appropriate for simpler, more straightforward acquisitions is necessary.

The flexibility called for in this approach does not coincide well with current Canadian acquisition policies. These policies have resulted in an acquisition process that can take 15-20 years to build a warship.[125] Furthermore, the involvement of three separate government departments (National Defence, Public Works, and Industry Canada) means that National Defence loses control over such issues as schedule, cost overrun and quality, very early in the acquisition process. Finally, since this policy is applied to all government contracts, regardless of complexity or scope, there is no flexibility to streamline the process. For example, there are occasions during the qualification stage that it is known early on, that there can and will only be a single qualifier for the contract; however, the process does not allow this phase to be skipped in favour of a sole-source contract, even though it would be more efficient and less costly to do so. The C-17 acquisition is a case in point.[126] These issues were raised by former Assistant Deputy Minister Materiel (ADMMat) Allan Williams in 2006, where he recommended consolidation of acquisition authorities into a single organization called Defence Procurement Canada, accountable to the Minister of National Defence.[127] Similarly, retired Commander

[125] Commander (Ret'd) Ken Bowering, "Military/Naval Procurement in Canada…
[126] Ibid.
[127] Allan S Williams, *Reinventing Canadian Defence Procurement: A View From the Inside*, (McGill-Queen's University Press, Montreal, 2006), 74-86.

Ken Bowering recommends creation of an organization modeled after the Australian Defence Material Organization which would be accountable for all military acquisition, reporting directly to the Minister of National Defence[128]. Establishment of such an organization would be a good first step because project definition and delivery would reside within a single organization. However, this organization would need authority to contract directly with suppliers and sub-contractors as required to deliver the necessary platform, be it a new development, or an off-the-shelf acquisition. The only way this level of contracting authority could be devolved without a major revision to Canadian acquisition policies is if this organization remained outside the normal scope of government acquisition processes – in effect a private entity instead of a government department. The most appropriate model to accomplish this within the Canadian context is a crown corporation. Under such an arrangement, the crown corporation would interact directly with government under normal funding and acquisition guidelines. However, as a semi-private entity it would then be free to contract design and construction with private firms or purchase off-the-shelf products as appropriate in order to satisfy defence acquisition requirements. While radical sounding, this approach is very much in keeping with Canada's past experiences. First, with Wartime Shipbuilding Limited during World War Two, and more recently as embodied in the government/prime-contractor relationship seen during the TRUMP, CPF and FELEX projects, following contract award. [129]

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[128] Commander (Ret'd) Ken Bowering, "Military/Naval Procurement in Canada…

[129] Dr Chris Madsen, "American Influence on Canadian Wartime Shipbuilding" (lecture, US Naval Academy, Annapolis, Maryland, 2007).

With some significant exceptions, current practice in Canada is to replace naval ships after 30 years, with a major mid-life upgrade at 15 years in-service, in order to restore overall capability of the warship. [130] This life cycle approach is the same general practice for the Royal Australian Navy. Australian studies indicate that capability in the latter 15 years, despite the mid-life upgrade, drops significantly with time, as compared to the first 15 year period. In the same period, annual maintenance costs for the platform increase quickly.[131] Australian analysts have modeled life cycle costs, and determined that the current Australian approach is the most expensive, on a capability per dollar basis. [132] The Australian study goes on to conclude that the optimal cost/capability balance is achieved by replacing warships at the 20 year mark, during which, 5 small upgrades are done instead of a major mid-life upgrade.[133] These results are used in the Australian study to argue that a 14 frigate replacement cycle could be used to sustain a continuous build program that would sustain the Australian naval sector, while providing the navy with a near optimal cost/capability balance. Given the similarities in approach, the same can be concluded for Canada. The Australian study cautions that their model is relatively simplistic and only applies to similar ship types; however, given Canada's current requirements for destroyers and frigates (a total of 16 similar vessels if current palns proceed), the Australian model could conceivably be applied to Canada, and is at the very least, worthy of further consideration. As one analyst pointed out, the Canadian

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[130] Current AORs, PROTECTOR and PRESERVER are each 40 years old; Remaining TRUMP Class Vessels (IROQUOIS, ATHBASKAN and ALGONQUIN) are 39, 39 and 38 years old respectively. All of these ships remain operational.

[131] Commonwealth of Australia, Defence Materiel, "The Australian Naval Shipbuilding and Repair Sector Strategic Plan…, 176-177.

[132] Ibid., 176.

[133] Ibid., 177.

reality is that governments tend to shy away from long-term capital procurement, because such a commitment means locking in to a long-term defence policy, which in the face of political and economic uncertainties is generally undesirable[134]. However, if the Australian study is correct, then long-term commitment might actually result in significantly less overall cost, thus justifying such a shift in policy.

Therefore, the elements of a flexible Canadian model, designed to sustain a naval shipbuilding sector in Canada includes three principle elements: use of the *Government/Industry Partnership Sustainment Model* when appropriate to do so, creation of a crown corporation with the flexibility to rely on several contracting methodologies as necessary, and a continuous-build methodology to sustain a permanent naval shipbuilding sector.

Figure 2 is provided as a conceptual representation of the proposed Canadian model. In practice, for new naval ship construction, the crown corporation would enter into a partnering arrangement with the single shipbuilding and repair entity to build the new platform, and an integration entity to integrate propulsion and combat systems into the completed platform. This partnering relationship would be defined through an alliance contracting type methodology, effectively establishing the government/industry partnership between government, the shipbuilding entity and the integration entity. Note that the relationship to this point is essentially the same as current government/prime-contractor relationships once a contract has been awarded.

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[134] John M Treddenick, "Distributing the Defence Budget: Choosing between capital and Manpower," *Issues in Defence Management…*, 57-82.

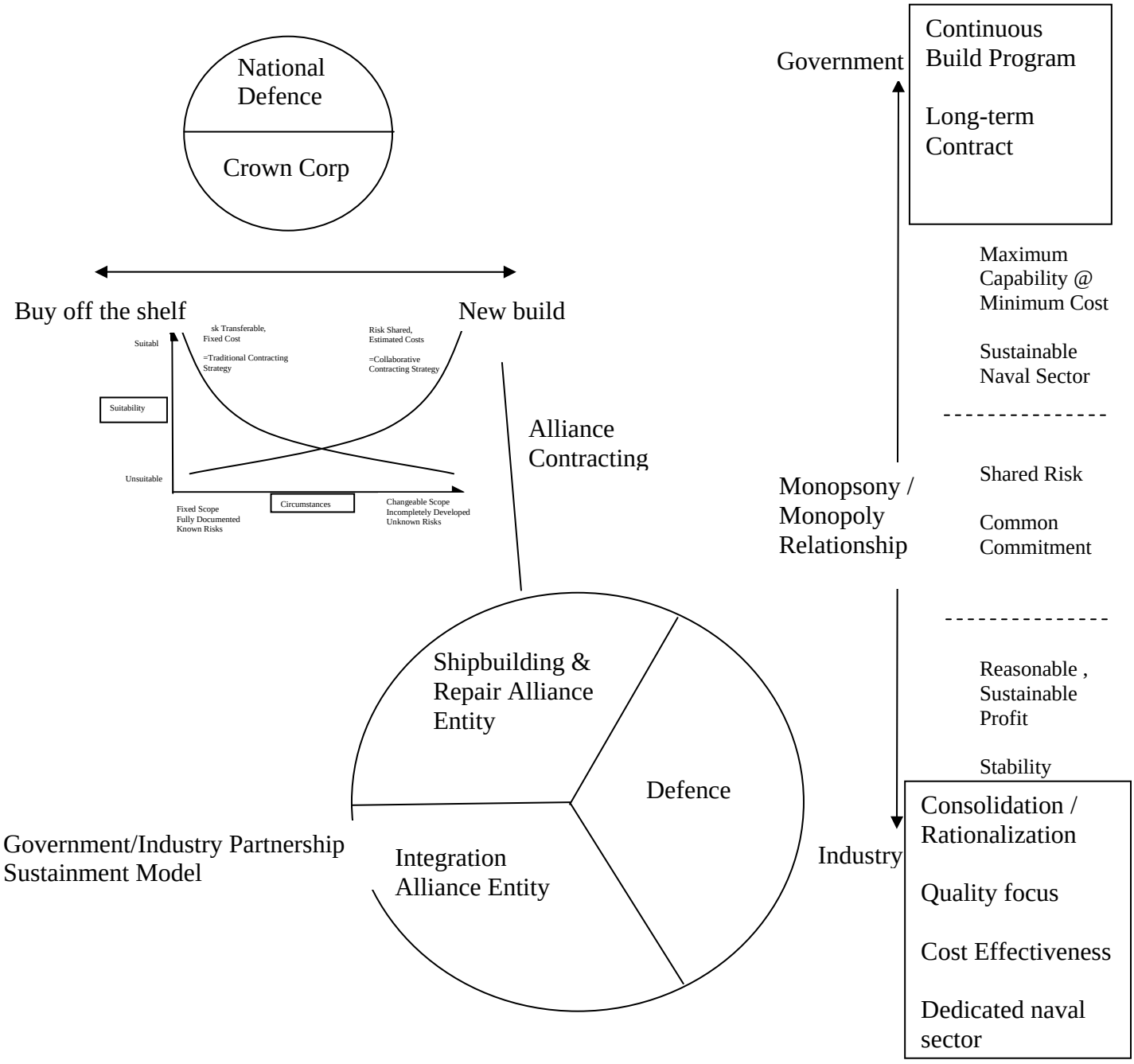

Figure 2- Proposed Canadian Model

The major difference in the proposed model is the existence of the single entity alliance created by industry rationalization and consolidation, which permits the monopsony/monopoly relationship essential to full partnership between government and industry. As in any partnership, both parties have obligations to the other. The government commits to a long-term, defined build process, and in return, industry commits to maintaining a cost-effective, dedicated naval sector, focused on quality. Both partners share the risks inherent in new ship design and construction, and are committed to project success, defined in terms of capability delivery, on schedule, and at best-cost. In terms of rewards, the government benefits from this arrangement in that the process maximizes capability in the delivered platform in a cost-efficient manner. In addition, the government retains a naval shipbuilding and repair sector capable of sustaining the Canadian navy. For its part, industry gains stability, and predictable and reasonable profits.

CONCLUSION

In the past, maritime economics necessitated nations sustaining large commercial fleets and maritime forces to ensure commercial sea lanes remained open to commerce. This dependence on ocean trade also meant the sustainment of national shipbuilding industries, which generally included a naval shipbuilding sector. By the end of the Second World War, Canada found itself in possession of a large commercial fleet of emergency wartime vessels unsuited for post-war markets, a large escort navy, and an equally large, but young and relatively inexperienced shipbuilding industry, employing over 120,000 people. While under pressure to maintain shipyard jobs, the government really had no intent to sustain a large shipbuilding capability. Since that time, Canada's shipbuilding industry, along with those of all western nations, has been in steady decline. Proctectionist practices and an aging fleet with access to few markets led to the demise of Canada's commercial fleet by 1960, a major blow to the shipbuilding industry in Canada. Strong competition from Asian shipyards enabled by high government subsidization and increasing protectionist policies internationally meant that western shipyards could not compete for international commercial shipbuilding contracts. Canada was no exception, and, as in the other western nations, Canadian shipyards came to rely increasingly on national government requirements such as naval platforms, and niche markets to sustain themselves.

In this evolution, certain developing trends meant that maritime nations possessing a navy now generally fit into three distinct groups: those with no national naval shipbuilding capability, who must buy naval platforms from other nations; those who sustain a national naval shipbuilding sector for economic interests; and, those that sustain a naval sector to sustain a strategic asset, namely their navy. Members of these groups share similar histories and experiences amongst their members, and each group is marked by characteristics which make them distinct from the other groups. In a similar vein, the two latter groups have developed different strategies to sustain their national naval shipbuilding capabilities. Specifically, two prevailing models have emerged: the *Transnational Sustainment Model* (European group) and, the *Government/Industry Partnership Sustainment Model* (AUSUKUS group). Canada, while sharing a common background and culture with the latter group, does not fit perfectly into either. At various times in its shipbuilding history, Canada has exhibited characteristics of both groups. Therefore, the solutions that have worked for either group are not necessarily suitable to Canada's situation for every instance. Since Canada, is not likely to change its general approach, it is reasonable to expect Canada will continue to share similarities with both groups. Thus, a Canadian solution would need to incorporate an element of flexibility that would allow it to do so. Shared cultures and histories, and political/economic commonality with the AUSUKUS group means that the *Government/Industry Partnership Sustainment Model*, is the most applicable to Canada. With some additional 'Canadianization' to add flexibility, this model could be adapted to meet Canada's desire to sustain a national naval shipbuilding capability.

The proposed Canadian model calls for establishment of a crown corporation, to work with, and on behalf of the Department of National Defence (DND) for all defence acquisition needs. As a crown corporation, it would have the flexibility to apply the most appropriate method to meet DNDs acquisition requirements. This could include everything between off-the-shelf purchases, such as the C-17 acquisition, to a complete new design/construction in Canada, such as the proposed Joint Support Ship. Solutions between these two extreme poles could also apply. For example, under certain circumstances the best solution might be to have a hull built in a foreign shipyard as one US study indicated, then install and integrate the complex combat systems in a Canadian shipyard. Alternatively, foreign-designed ships could be built in Canada under license. This methodology does not exclude either possibility. For complex new building of unknown scope, undefined cost and high-complexity (such as a warship), the crown corporation would engage the Shipbuilding and Repair Alliance Entity. This entity, an alliance of private shipyards, along with the Alliance Integration Entity, an alliance of private integration system integration firms, would have pre-established a partnership relationship with DND, based on the monopoly/monopsony relationship discussed earlier. The key element of this relationship is that it remains in existence for a long period, instead of the current practice of competitive selection. Thus when required, it is available. Of course, the other key element of this arrangement is the necessity for government to commit to a long-term shipbuilding plan which permits the shipbuilding and integration entities to sustain key skills and infrastructure.

The flexibility inherent in the crown corporation construct, together with the stability created by the government/industry monopsony/monopoly partnership provides Canada with a suitable mechanism to sustain a naval shipbuilding sector in Canada. Several obstacles have to be overcome before this could become a reality. First, the Canadian government would need to commit to a long-term shipbuilding plan, something it has never done in the past, and as sources have noted, would be expected to be loathe to do in future. Secondly, the relationship between government and industry would have to fundamentally change. The partnership model, is very much a partnership, where both parties work to a common goal, albeit on a quid pro quo basis, but with an element of trust between them. The relationship between government and industry in Canada has traditionally been an adversarial 'us and them' type relationship. However, the recent practice of awarding major projects to a Prime-contractor has gone a long way towards evolving this relationship to more of a partnership footing. Similarly, the most recent example of this, the two Multi-Ship Refit contracts, will see what is effectively a partnership relationship between the Halifax Shipyards, Victoria Shipyards and the Canadian government for a period of 12 years. In Canada's experience, this is new territory that speaks well for the possibility of establishing a new relationship between government and industry in Canada.

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