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EXERCISE NEW HORIZONS

AVOIDING TOKENISM: THE NEED FOR A BALANCED SUBMARINE FLEET

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Abstract

The acquisition of four used British Upholder Class submarines by Canada proves that the nation's leaders recognize the importance of submarines to the security of the nation. These four submarines replace three decommissioned Oberon Class submarines that Canada operated in the Atlantic for more than 30 years. One of the new Victoria Class submarines has been assigned to Maritime Forces Pacific. The submarine, HMCS Victoria, will be the first submarine operated by MARPAC in almost 30 years. Given the changing geo-political, and security environment, assigning a submarine to MARPAC is appropriate. The growing importance of the Pacific Ocean region must result in an active Canadian diplomatic and military presence. From supporting Canada's interests in the Pacific, to supporting ASW training, to sovereignty patrols of Canadian waters, the operational schedule will be excessively demanding. To support all these missions, MARPAC needs two submarines to provide a near full–time capability.

AVOIDING TOKENISIM: THE NEED FOR A BALANCED SUBMARINE FLEET

> The primary obligation of the Department of National Defence and the Canadian Forces is to protect the country and its citizens from challenges to their security…. In the final analysis, it may be said that a nation not worth defending is a nation not worth preserving.[1]

Submarines are effective tools of peace and war, and are force multipliers of considerable stealth and power.[2] Nations that operate submarines have identified to their friends, and potential adversaries that they are prepared to make a substantial investment in support of their defence commitments. Canada is one of those countries that has recognized this reality, and the nation has decided to retain a submarine capability following the recent decommissioning of Canada's three Oberon Class submarines.

Canada is currently in possession of three of the four ex-Royal Navy, Upholder Class diesel-electric submarines (SSKs) acquired in 1998.[3] The fourth submarine, *HMCS Chicoutimi* is currently undergoing its reactivation program, and will be transferred to Canada in the near future.[4] All four submarines require engineering modifications to prepare them for Canadian operations.[5] Once these upgrades have been completed, and their crews trained, the submarines will be tasked with missions for which they are well suited.[6]

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[1] Department of National Defence, *1994 Defence White Paper*, (Ottawa: Canada Communications Group, 1994), 2.

[2] The Heavy Weight Torpedoes (HWT) carried by modern submarines have been called 'ship killers'. While most modst (e)Tj10.02 0 0 10.01 261463732 246.77998 Tm(rn)Tj10.02 0 0 10.02 165010231 246.77998 Tm(y)Tj10.02 0 0

Canada's political and military leaders have chosen to transfer one of the subs[7], *HMCS Victoria*, to Maritime Forces Pacific (MARPAC), located in Esquimalt, British Columbia.[8] The re-establishment of a submarine capability in MARPAC is long overdue as there has been no permanent submarine assigned to the West Coast since *HMCS Rainbow's* departure in 1974.[9] The impact of this action is summarized in MARPAC's *VICTORIA Class Submarine Support Plan* as:

> The re-introduction of a permanent Canadian submarine presence in the Pacific will have a significant impact on the operational capability of Canada's naval forces in the Pacific, and a corresponding affect on this country's influence in the region. The availability of a MARPAC submarine will also be a tremendous asset to assist in the protection of Canadian sovereignty on our West Coast, and assist in the training of Canadian and US forces against a submarine threat in the littoral environment.[10]

The traditional concentration of Canada's naval capabilities in the Atlantic has been based on many things, such as the legacies of two global conflicts that from Canada's national perspective were concentrated in the North Atlantic region. As well, since the end of World War II, Canada's collective security commitments to our allies in NATO, and the Cold-War face-off between nuclear powers had a strong Atlantic focus militarily.

Today the Cold-War threat has diminished, and the North Atlantic, bordered by peaceful like-minded nations could be described as one of the safest bodies of international water on the planet. Perhaps it is time to recognize that the changes in our world should probably influence the assignment of our limited military resources.[11]

Canada's trade and security interests in the Pacific Ocean region are becoming increasingly important. In 2002, sixty-four percent of Canada's imports came from the

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[7] Submarines will be referred to as submarines, subs, boats or SSKs throughout this paper.
[8] *Victoria* is expected to sail to Esquimalt in the summer of 2003.
[9] David J. Perkins, *The Canadian Submarine Service in Review*, (St Catharines: Vanwell Publishing, 2000), 194.
[10] Vice Admiral G.R. Maddison, *VICTORIA Class Submarine Support Plan for Maritime Forces Pacific*, (CMS): 07 December 2000, Annex A. A-14/14.
[11] In May 1999, the Director of Maritime Strategy presented to the Chief of Maritime Staff the results of a study into basing options for the Victoria Class boats. Of a total of 6 possible options, the best overall option was to operate all boats out of Halifax. The second best overall option was two boats and two crews per coast. When cost was the single determinant, the two boat two crew per coast option was last. See:

United States (US) and Mexico. Over fifteen percent of our imports originated in countries from the Asia-Pacific.[12] Collectively, the countries of the Asian-Pacific are Canada's largest trading partners after the United States of America.[13] Statistics Canada has recognized this increase in Asia-Pacific trade as an upward trend. This growth, and the huge economic potential in the future due to trade liberalization in China are of considerable importance to Canada. Accordingly, Canada needs a proactive diplomatic and military presence throughout the Pacific region to support her increasing interests. As suggested by Dr. William Saywell, President and CEO of the Asia Pacific Foundation of Canada, "We are moving toward the Asian Century."[14]

Given the importance of this region to Canada, it is time to consider a more balanced submarine capability. This would be in keeping with the direction in the 1994 Defence White Paper (DWP), which states, "ships are being re-distributed to achieve a better balance between Canada's two open-water oceans."[15] This has resulted in a more closely balanced surface fleet between the coasts in recent years. A balanced assignment of new submarines would be the next logical step.

Although the current DWP is almost ten years old, it recognized the importance of the Pacific Ocean region to Canada, and took steps to prepare Canada's military for the future. If anything, since 1994, the importance of the Pacific Ocean region has become more obvious to Canadians, and it is unlikely that future government policies will ignore or downplay the region's significance.

The arrival of *Victoria* in the Pacific will provide a new resource for Canada's West Coast Navy. *Victoria* will join a small cadre of SSKs operated by Canada's

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Captain(N) J.S. Dewar, *Submarine Crewing and Basing Working Group Analysis Results*, (DMARSTRAT: 3000-1), 14 May, 1999, 5.

[12] Department of Foreign Affairs and International Trade, *Canada's Merchandise Imports*, Available from http://www.dfait-maeci.gc.ca/eet/cimt/2002/pfact_annual_trade_2002-en.asp; Internet; Accessed 5 May 2003.

[13] Data from The Trade and Economics Division of Statistics Canada reports that exports and imports between Canada and the Asian-Pacific nations continue to exceed that of all Western and Eastern European countries combined. Five of Canada's top ten trading partners are located or have ports on the Pacific Ocean. See: DFAIT website, http://www.dfait-maeci.gc.ca/eet/cimt/2002/pfact_annual_trade_2002-en.asp; Internet; Accessed 5 May 2003.

[14] The Senate of Canada, *The Importance of the Asia Pacific Region to Canada*, Interim Report to the Senate of Canada. Available from http://www.parl.gc.ca/english/senate/com-e/fore-e/rep-e/apc-e.htm#relevance; Internet; accessed 5 May 2003.

[15] Department of National Defence, *1994 Defence White Paper*…, 46.

traditional Pacific region allies.[16] With one boat and one crew, MARPAC will have a part-time submarine capability. In order to maintain a reasonable capability a minimum of two submarines is required. Despite an advertised 'theoretical' availability of 280-300 days per year for a Victoria Class submarine it would be irresponsible to state that the boats would be capable of this level of activity.[17] The aim of this paper is to demonstrate that Canada must permanently assign two Victoria Class submarines to Maritime Forces Pacific. This should occur after all four submarines have reached operational status.

The assignment of a single boat to the West Coast will be a dramatic improvement to MARPAC's capability, but it will not be enough to fulfill Canada's ever-increasing commitments in the Pacific. MARPAC needs a minimum of two fully operational boats, and there are three primary reasons why this is necessary.[18] To begin, due to the strategic importance of the Asia-Pacific region to Canada, MARPAC needs a minimum of two boats to ensure it can participate with our allies in the security of this important region. Secondly, West Coast maritime forces including ships, helicopters and Maritime Patrol Aircraft (MPA) need submarines as live training targets to regain Anti-Submarine Warfare (ASW) skills that have atrophied over the last several years.[19] Finally, MARPAC needs submarines to conduct Intelligence, Surveillance and Reconnaissance (ISR) patrols. These patrols will be required internationally, in Canadian territorial waters out to the 200 nautical mile Exclusive Economic Zone, and throughout

[16] The navy maintains key cooperative military alliances with the United States and Australia in the Pacific. Coordinated joint and combined exercises such as RIMPAC, and Tandem Thrust are conducted on even and odd years respectfully. Other Pacific Rim nations such as Chile, Japan, Peru and South Korea participate in the RIMPAC exercise that is always conducted in the Hawaiian Operations Areas.

[17] The *VICTORIA Class Submarine Support Plan for Maritime Forces Pacific* indicates that "theoretically", once operational, the submarine will have an availability of 280-300 days per year.

[18] There is obviously a cost to splitting a limited resource between Canada's two Maritime Formations. In this case it may not be as significant a financial cost as some may fear. The 1999 *Submarine Crewing and Basing Working Group Analysis Results* indicate that the development of shore facilities to support two submarines in MARPAC would be expensive. This cost problem may have been alleviated by the March 2001 Submarine Support Plan, where it indicates that MARPAC's newly opened Submarine Support Facility (SSF) was specifically designed with spare capacity for future growth if a second boat or second crew were provided to MARPAC. See: *Victoria Class Submarine Support Plan for Maritime Forces Pacific*, Annex D, D-6/15.

[19] Maritime surface and air forces have experienced a reduction in scheduled ASW training in the last few years. This has been exacerbated by the lack of USN submarines to train with due to their own high tempo operations throughout the Pacific.

MARPAC's Area of Responsibility (AOR).[20] This paper will identify the requirement for two MARPAC SSKs based on an assessment of the three broad categories identified above. The justification for the assignment of two boats to MARPAC will be summarized in a conclusion.

The Federal Government's 1994 DWP recognized the importance of the Asia-Pacific region.[21] It states that Canada has become an active participant in regional security issues:

> particularly through the encouragement of regional security dialogues such as the Asia Regional Forum, the Council for Security Cooperation in Asian Pacific, and the Canadian Consortium on Asia Pacific Security. All of these activities will continue, and as our economic stake in the region grows, Canada will play a more active role in its security. To this end, we will expand the current program of bilateral military contacts we maintain with a variety of Asian countries, including Japan, South Korea, and members of the Association of South East Asian Nations (ASEAN).[22]

In 1995, the Department of Foreign Affairs And International Trade (DFAIT), produced the nation's foreign policy document, *Canada in the World*. Contained within this policy are the key economic, diplomatic and security objectives, which the Government desires to champion. This foreign policy also recognized the importance of the Asia-Pacific region to Canada, and the geo-political concerns resident there. The policy states:

> There are serious security challenges in the region including unresolved border disputes, human rights abuses, an increase in weapons acquisitions… population growth and, narcotics trafficking ….We are also expanding our political and security dialogue with Japan, South Korea and ASEAN countries, and promoting the integration within the region of Vietnam and China.[23]

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[20] MARPAC's primary AOR covers 1.7 million square kilometres of the Northeast Pacific Ocean, from the 48th parallel at the entrance to the Straits of Juan de Fuca, westward about 1,200 kilometres and north to the Aleutian Islands.

[21] The Asia-Pacific Economic Cooperation forum (APEC) consists of 21 countries. They range from Canada in the east, across the Pacific Ocean to as far away as Singapore in the west. When the term 'Asia-Pacific' is used throughout this paper it will generally refer to this geographic region..

[22] Department of National Defence, *1994 Defence White Paper*…, 37.

[23] Department of Foreign Affairs and International Trade, *Canada in the World*, (Ottawa: Canada Communications Group, 1995), 30-1.

More current direction to the Canadian Forces, *Shaping the Future of the Canadian Forces: A Strategy for 2020, (Strategy 2020)* was released in June 1999. This document is the primary reference for all force development initiatives,[24] and clearly identifies that the "Defence mission is to defend Canada and Canadian interests and values while contributing to international peace and security."[25] *Strategy 2020* also indicates that forces must be globally deployable, and completely interoperable with our principal allies.[26] In order to support this from a maritime perspective, the navy is mandated, "To generate and maintain combat-capable, multi-purpose maritime forces to meet Canada's Defence objectives."[27]

Leadmark – The Navy's Strategy for 2020 summarizes the problems in regions around the globe, with considerable space devoted to an analysis of nations in the Pacific region. *Leadmark* identifies the Northeast Asia region in particular as:

> another of the most heavily armed regions in the world, particularly with respect to naval power. With several countries engaged in significant defence modernization programs, and faced with ongoing cultural-political tensions and resource disputes, the region is forecast to remain highly militarized in 2020.[28]

These concerns are not unique. The Dalhousie University Centre for Foreign Policy Studies has conducted security studies on many regions in the world. In the Centre's recent, *Regional Maritime Security in the Asia-Pacific Region: Workshop Summary*, a comprehensive analysis of the region is provided. The paper emphasizes that, "There is an undeniable interconnectedness between this region and the global environment, which places the Asia-Pacific region on a pedestal of increasing importance."[29] Growing economic power, populations and militaries in the Asia-Pacific region make Canada's interests there of critical importance.[30] Submarines operated by

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[24] Department of National Defence, *Leadmark: The Navy's Strategy for 2020*, (Ottawa: CMS, 2001), 5.
[25] Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020*, (Ottawa: Canada Communications Group), 2.
[26] Department of National Defence, *Shaping the Future of the Canadian Forces*:…, 10.
[27] Department of National Defence, *Leadmark*:…, 92.
[28] Ibid, D5-D12.
[29] David N. Griffiths and Fred W. Crickard, "*Regional Maritime Security: Four Case Studies"*, (Halifax: Centre for Foreign Policy Studies, Dalhousie University), 25. Available from http://www.dal.ca/~centre/RMS4.pdf; Internet; Accessed 5 May 2003.
[30] It is forecasted that by 2020 seven of the world's largest economies, and 60% of global trade will be in the Asia-Pacific region. Today, 40% of global shipping transit the busy maritime trade routes situated

MARPAC can play an active role in influencing events in the Asia-Pacific from both a military and political perspective. Canadian author Peter Haydon succinctly described the capability and flexibility of submarines in these roles as follows:

> Submarines have several distinct advantages of government policy, both nationally and internationally. They may be pre-positioned in an area of interest, overtly or covertly. They enjoy an unparalleled degree of freedom of action and independence. Finally they can be easily withdrawn without diplomatic cost or commitment. The same can actually be said for most naval forces except that a submarine has the unique advantages of stealth and extended presence.[31]

A 'Report to Congress' in 2000, provided the US administration insight into Chinese ambitions in the region, and reservations concerning the build up of China's maritime forces.[32] Of specific relevance to the arguments in this paper, the report indicates that it is China's intention to maintain a large submarine force. In addition to a continuing upgrade program, the People's Liberation Army (Navy) has developed a submerged Anti-Ship Cruise Missile (ASCM) capability.[33] Significantly, the newer domestically designed and produced diesel submarines of the SONG and the MING Class may have very sophisticated western technology.[34] The report further estimates that by 2010, older Russian made boats will be decommissioned leaving a relatively modern fleet possessing the latest in both Chinese and Russian weapons technology.[35] Further complicating matters is a report which indicated that the PLA(N) was in negotiations to acquire the Shkval rocket propelled torpedo from Russia.[36] This torpedo travels at 360

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throughout the region. Canada needs to be an active participant with her Pacific Ocean neighbours in what some have described as the "Pacific Century". See: "*Regional Maritime Security: Four Case Studies"*, 26-7.

[31] Peter Haydon, *Canada's Future Submarine Capability*, (Halifax: Centre for Foreign Policy Studies), 21.

[32] United States, Congress, "*Annual Report on the Military Power of the People's Republic of China"*, 18-23. Available from http://www.defenselink.mil/news/Jul2002/d20020712china.pdf; Internet; Accessed 5 May 2003.

[33] China's naval forces are referred to as the PLA Navy, or PLA(N). See: Joe Varner, *Canada's Asia-Pacific Security Dilemma*, (Naval Officer Association of Canada, 1999), vi.

[34] It was suggested that the passive flank arrays on these boats are of French design, and the diesel engines are German. See: United States Congress, "*Annual Report on the Military Power"*…, 21.

[35] United States, Congress, "*Annual Report on the Military Power"*…, 21-3.

[36] The Shkval torpedo, once a highly classified system, is now written about extensively. The data provided in this paper was taken from the Internet.

kilometres per hour underwater, can carry a nuclear warhead, and was specifically designed for use against US Navy Carrier Battle Groups.[37]

It is apparent that Canada's views of the region are similar in some respects to those of the US. Canadian author Joe Varner has suggested that China, "represents the most serious challenge to Canadian interests in the Pacific…the Chinese economy is growing at an amazing rate…its military and political prestige grows along with it."[38] He supported this assumption by recognizing that:

a. China has expanded its national security objectives;
b. China has changed its patterns in the use of military force;
c. China is developing a modern sea control capability; and
d. China has concluded a series of diplomatic agreements that allows it to concentrate its efforts on the Eastern Asia-Pacific.[39]

Chinese scholars and leaders have their own visions of the future. Colonel Xu Weidi of the Chinese National Defence University has suggested that in the future, "the two great zones of war will be the East Asian littoral (because of territorial disputes) and the Eurasian zone, including Central Asia and the Persian Gulf."[40]

North Korea also threatens the stability of the region, and has been viewed as a, "challenge to world peace ever since its invasion of the South in 1950, which led to the Korean War with Canadian participation. Today, Canada has very strong economic ties and interests in South Korea and the continuing North Korean threat remains a challenge to the security of those interests."[41] North Korea, faced with a desperate domestic situation continues to thwart attempts to resolve her relationship with her neighbours.

Russia is another issue as she continues to maintain strategic nuclear forces despite her new relationship with the West. A change in her "financial situation, or

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[37] Anthony L. Kimery ed, "The Hunt for Red Shkval", *Military Information Technology Online,* Volume 4, Issue 7, (29 March, 2003), Available from http://www.mit-kmi.com/Archives/4_7_MIT/4_7_Art1.cfm; Internet; Accessed 5 May 2003.
[38] Joe Varner, *Canada's Asia-Pacific Security Dilemma*, (Naval Officer Association of Canada, 1999), 35.
[39] Ibid, 35.
[40] Michael Pillsbury, *China Debates the Future Security Environment*, (Washington: National Defence University Press, 2000), 259.
[41] Joe Varner, *Canada's Asian-Pacific Security Dilemma*…, 34.

government, could end current cooperation with the West, and result in a renewal of past confrontation."[42]

China, North Korea and Russia are only three of the many countries that have the potential to affect the strategic balance in the region. In anticipation of this possibility, Canada and her allies must be proactive in ensuring the security of this delicate part of the world. A positive reflection of this commitment will continue to be the Navy's ability, and willingness to deploy naval forces to the region. Soon, this may include submarines from MARPAC.

Diplomats, scholars, and senior military officers agree that the region from the Persian Gulf eastward to Japan will be a great diplomatic challenge for Canada and her customary allies. Unlike the Atlantic, where Canada's political and military alliances are strong, the Pacific Ocean region contains countries and governments not considered to be traditional allies. As a Pacific nation, Canada has a responsibility to help guide the region to a peaceful and secure future. Given that the government has recognized the growing importance of the Pacific region, it would be irresponsible of our leaders not to provide MARPAC with the resources to support the government's policies.

MARPAC has not had a permanent submarine capability for almost thirty years. This was mostly due to a lack of resources, and a strong Atlantic connection due to our defence partnership in the North Atlantic Treaty Organization (NATO). This shortfall was regrettable, but thankfully the presence of USN submarines in Canadian waters contributed to our collective defence. Since the end of the Cold War, the USN has reduced their submarine fleet, and those that remain still operate at high tempo.[43] The result is that today, US submarines are rarely available to support Canadian operations in Canadian waters.

The introduction of a single boat to the west coast will improve MARPAC's ability to fulfill Canada's defence, and foreign policy commitments. Operational taskings for the boat in support of the navy, the government, and our friends and allies will

[42] Ibid, 50.
[43] Norman Polmar, "The ASW Shift", *United States Naval Institute*, *Proceedings*, June 2000: 87-8.

enhance MARPAC's contribution to Pacific region security.[44] These taskings could include operational patrols in Canadian waters, or those of other nations. Patrols could be covert and sensitive in nature, or they could be overt and used as a physical indicator of Canada's interest in a particular region. The submarine could deploy in company with other naval units, but given its speed limitations it would more likely operate independently in support of a naval surface force. The submarines would ideally be employed in barrier or area operations in order to take full advantage of their detection capabilities.[45]

An SSK, operating independently, is the best ASW weapon in the Navy. ASW is the role in which a well-trained submarine crew will strive to excel. Other roles such as anti-surface operations, intelligence collection, and landing of Special Forces would also be important.

It will be impossible for a single boat to provide MARPAC the extended capability that is needed. Availability will be affected by maintenance and leave periods where a submarine capability will be completely unavailable. To maintain our influence and credibility, Canada needs a minimum of two submarines in MARPAC to sustain a near full-time submarine capability. Furthermore, having two boats for CAN/US operations or training will significantly enhance MARPAC's credibility with her neighbours to the south.

In a perfect world, it would be likely to take a minimum of three fully operational boats to sustain a true full-time capability, with a fourth boat in refit or extended maintenance and unavailable. Realistically, it would be difficult for Canada to sustain this level of operations permanently, even if all submarines were assigned to one coast. That being the case, to maintain a year round operational capability on both coasts, Canada would need a minimum of eight submarines. As this is not likely in the near term, splitting this limited resource between the coasts is the best way for both coasts to selectively participate in the security of their respective ocean regions.

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[44] The Victoria Class submarines can conduct 50-day patrols and have a range of up to 8000 nautical miles. See: Department of National Defence, *Victoria Class Submarine Interim Concept of Employment Guidance…,* 5.

[45] Barrier operations are generally conducted at a chokepoint, or a geographic region where the transit of enemy forces is anticipated. Area operations imply a fixed geographic patrol area.

The second reason to assign two boats to MARPAC is training. In the last several years the navy has reduced the time at sea devoted to ASW training. The concentration on Above-Water Warfare (AWW), Anti-Surface Warfare (ASuW), and the mission specific training required to support the extensive contribution Canada has made to the war against terrorism have created this training shortfall. Thankfully, for those ships participating in operations in the Arabian Gulf region, submarines have not been assessed as a threat, even with the possible presence of submarines from nations located in the region not commonly considered to be Canada's allies.

Overall, the single greatest contributor to the neglect of ASW training has been the almost total lack of submarines to operate with for unit and coordinated ASW training. This problem affects everyone. The limited Pacific Ocean friendly submarine resources are as much a concern for the USN as they are for MARPAC. The table below identifies the submarines operated by Canada's traditional Pacific region allies.[46]

Submarine Fleets: Canada's Traditional Pacific Allies

Country	SSK	SSN	SSBN	Remarks
USA	0	54	18(note 1)	Modern fleet
Australia	6	0	0	(note 2)
South Korea	8	0	0	Building up to 4 new SSK's
Japan	16	0	0	Building 4 new SSK's

Note 1: 4 SSBN's to be converted to SSGN's.
Note 2: The boats are slowly becoming operational after considerable delays..

Figure 1 - Submarine Fleets of Traditional Pacific Allies

Conversely, the following table is a list of over 200 submarines operated by other Pacific and Indian Ocean navies.[47] The table does not imply that Canada views these nations as a threat to her interests or military forces. It does, however, demonstrate that many countries in the region have credible submarine forces, and that expansion of this capability is a common objective. More significantly, the table recognizes the preponderance of SSKs in the region. These SSKs will generally be employed close to

[46] Stephen Saunders ed. *Jane's Fighting Ships: 2002-2003*, (Coulsdon: Jane's Information Group, 2002).
[47] Stephen Saunders ed. *Jane's Fighting Ships: 2002-2*003, (Coulsdon: Jane's Information Group, 2002).

their home nations to counter the submarines or surface combatants of unfriendly neighbours. Additionally, as North Korea has demonstrated, these boats can be used to deliver spies or Special Forces personnel clandestinely to an adversary's coastline.

Pacific/Indian Ocean Fleets of Interest

Country	SSK	SSN	SSBN	Remarks
China	59 (note 1)	5(note 2)	1(note 3)	Modernizing fleet
North Korea	84 (note 4)	0	0	Aggressively operated Not well maintained
Pakistan	7	0	0	
Iran	3	0	0	Primarily operate in Arabian Sea
Russia	22	16 (note 5)	17	7 SSGN's
India	19	(note 6)	0	Modern fleet
Indonesia	2	0	0	One operational
Taiwan	4	0	0	6 more SSK's planned

Note 1: numerous replacement/upgrade programs underway
Note 2: building 2 with 1 more planned
Note 3: one more planned
Note 4: 22 Patrol, 22 Coastal and 40 midget boats
Note 5: building 3
Note 6: building 1

Figure 2 - Submarine Fleets of Key Pacific/Indian Ocean Nations

Figure 2 clearly indicates that ASW forces could face a major challenge in the event of tension or conflict in the region. This is yet another reason why MARPAC needs two boats. Canada needs to aggressively train her ASW forces to locate, identify, track, and if necessary attack the quiet SSK that is common in the Pacific. The tools in the surface and maritime air fleets are still in place to do so.[48] The only shortfall is an effective opposition to exercise against.

The introduction of the Canadian Patrol Frigate (CPF) was a major technological leap ahead in terms of ship fitted combat systems.[49] In addition to an embarked ASW

[48] Canada's ASW capability has actually improved since the introduction of the CPF with its passive sensors. The USN, however, has lost significant capability. ASW in the USN was afforded considerable resources during the Cold-War. Over the last 15 years the USN has dramatically reduced the size of its ASW forces. See: Norman Polmar, "The ASW Shift", *United States Naval Institute, Proceedings*, June 2000: 87-8.

[49] The CPF is a technologically advanced platform and the capabilities of the ship are public knowledge. This paper will highlight only ASW systems to support the discussion.

helicopter, the CPF is fitted with an impressive suite of ASW sensors.[50] Twelve Tactical Acoustic Sensor Operators (TASOPS) in a CPF operate the ASW suite, and make up a portion of a much larger ASW team. This team consists of Naval Combat Information Operators, Weapons Directors, Operations Room Officers, bridge staffs, and an assortment of technicians. Their ASW mission is a complicated one, requiring extensive training to achieve an acceptable level of proficiency. These skills are perishable, and require almost constant exercise. Some of this training is conducted with Computer Based Training (CBT) and simulation.[51] Ultimately though, even with all the simulation tools available, ASW forces need a realistic target to further develop and polish the skills that are needed.

Submarines have always proven to be critical tools for the training of ASW teams. The book, *The Canadian Submarine Service in Review*, summarizes how the Victoria Class can provide this service:

> As a training vehicle the Canadian navy's *Victoria* class submarines will provide the means to ensure that all aspects of ASW are thoroughly exercised by Canada's air and surface forces. Frequent, well-planned ASW exercises are beneficial to all participants - honing the skills of intruder and defender - the hunter and the hunted alike. There will also be opportunities for Canada to repay its allies for the services rendered during the Cold War. Neither the USN nor the RN have conventional submarines and if their ASW assets require training time with conventional submarines, Canada will be able, indeed beholden, to oblige.[52]

The *Victoria* will be used extensively in this role. From a Canadian perspective, without this coordinated training conducted with other ships, ASW helicopters, and patrol aircraft, a Canadian ship will never successfully complete her annual Combat Readiness

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[50] The CPF's have been fitted with one of the best passive and active sonar suites in the world. The CANTASS towed array system is designed for the passive detection of noise throughout the water column. Highly trained and practiced operators have demonstrated their skills in many exercises and operations since the ships were introduced. A modern hull mounted medium frequency active sonar has also extended the active detection ranges over those achieved by legacy systems.

[51] Training can also be conducted in a simulation mode using the ships combat system, while the ship is alongside or underway. The most advanced, simulated training can be conducted in this fashion in a single ship, or among an entire Task Group. The Naval Operations School located in Halifax Nova Scotia has also recently been fitted with a fully operational and inter-connected Operations Room Simulator where small or large-scale Combat Team Training is conducted.

[52] David J. Perkins, *The Canadian Submarine Service in Review*, (St Catharines: Vanwell Publishing, 2000), 180.

Requirements (CRRs) for ASW.[53] While the training of our own forces is critical, we must remember that USN forces in the Pacific desperately need Canada's SSKs for their own ASW training. In fact, it has been suggested that the USN would willingly pay Canada for the use of the Victoria Class submarines for training.[54]

The RAND Corporation, in a study conducted on US naval training, recognized training problems for the USN. The study stated that:

> During the Cold War, ASW was the primary focus for U.S. destroyers. The large and powerful nuclear submarine force of the Soviet Union was viewed as the primary threat to U.S. Navy operations, particularly in the open oceans of the world. ASW dominated much of the training for destroyers. Also, the presence of Russian submarines provided numerous opportunities to practice that training during deployments…. The end of the Cold War and the collapse of the Soviet submarine force led to a reduction in the priority of ASW training. Other missions, such as antiair, land strike, and ASUW, now have higher priorities, both in operations and training. Likewise, the focus for ASW training shifted from the threat of nuclear-powered, deep-water submarines to diesel-powered submarines in shallow water. Advances in stealth techniques for diesel-powered submarines plus the detection difficulties in the littoral environment have made the ASW mission even more difficult.[55]

Approximately forty-five countries operate submarines today. The proliferation of SSKs in particular is a concern to the peaceful nations of the world as these platforms are ideal for operations in the littoral, an area where future naval manoeuvres and actions will likely occur.[56] This is the scenario to which Canada and her allies must train. The RAND Corporation recognized this in its report where it states:

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[53] CFCD 102(H) is Maritime Commands *Combat Readiness Requirements Manual*. From an ASW perspective, it provides direction to forces on training requirements that must be completed throughout the year. Monthly reports are submitted from each unit indicating the status of the units training. For ASW training, the manual has chapters covering ship, submarine and Task Group level ASW training standards. While basic ASW training serials may not require a submarine, the more advanced serials require at least one submarine to successfully complete the desired training goals. See: *CFCD 102(H)* Chapters 7, 13 and 18.

[54] Mark Romanow, "Top Flight Upholders – A Quantum Leap in Capability", *Defence Association National Network*. Available from http://www.sfu.ca/~dann/Backissues/Romanow.htm; Internet; accessed 7 May 2003.

[55] John F. Schank *et al*, *Finding a Balance: Simulator and Live Training for Navy Units*, (Santa Monica: RAND, 2002), 170.

[56] *Leadmark* defines the littoral as: coastal sea areas and that portion of the land which is susceptible to influence or support from the sea, generally recognized as the region which horizontally encompasses the land-watermass interface from 100 kms ashore to 200 nautical miles at sea, and from the bottom of the ocean to space.

> The increasing difficulty is compounded by the lack of real-world training opportunities. The US Navy has no adequate shallow-water training areas, and ASW teams have few opportunities to practice against diesel submarines. Foreign submarines are rarely available as potential training targets… there is little opportunity to practice that training in a purely "live" environment, especially when deployed.[57]

Canada and her allies must prepare their ASW forces for the submarine threats of tomorrow. The PLA(N) has recognized that the submarine is a key element of sea power. Captain Shen Zhongchang from the Chinese Naval Research Institute has written about sea power, and provides some insight into how China may fight in a future conflict. He suggests that China should attack the naval logistic capabilities of an opposing force.[58] This recommended course of action has terrible consequences for the USN.[59] With a view that is shared by many in the West, "Shen predicts that the most powerful naval weapon in future warfare will be submarines."[60]

A modern day example of the power of the submarine threat was the presence of the Argentine SSK, *ARA San Luis* in the vicinity of the Falkland Islands during the Falklands War. This single SSK was undetected during the war, and the Royal Navy expended more than two hundred ASW weapons against perceived threats without achieving success.[61] The same problem is possible today. While an adversary could attack an enemy's logistics in the open ocean, future maritime conflicts are more likely to occur close to shore. This region will be noisy, with considerable background ambient noise, and the noise of shipping and sea life. This factor will complicate the detection of opponents even for the skilled ASW teams. This is the scenario for which we must train.[62]

Training is one of the many missions for an SSK, and some would say that in times of peace, it is the most important. Two submarines will be required in MARPAC

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[57] John F. Schank *et al*, *Finding a Balance: Simulator and Live Training*…, 171.
[58] Michael Pillsbury, *China Debates the Future Security*…, 293-4.
[59] The US military will transfer almost 95% of its war material by sealift when it goes oversees. The primary threat to the safe and timely delivery of this material is the enemy submarine. See: Richard T. Ackley, "Sealift and National Security", *United States Naval Institute Proceedings*, July 1992: 42.
[60] Michael Pillsbury, *China Debates the Future Security*…, 295.
[61] John P. Benedict Jr., "Third World Submarine Developments", *The Submarine Review*, October 1990: 53.
[62] Sharon Berry, "Undersea Forces Adjust Tactical Forces", *Signal*, February 2003: 55.

to ensure that they can support the training of Canadian ASW forces and those of our friends and allies. In addition to the training of Canada's ASW forces, MARPAC boats would have tremendous unit training opportunities. USN strategic submarine forces are based less than 100 miles from Esquimalt in Bangor Washington. USN attack submarine forces are located in San Diego California, and Pearl Harbor Hawaii. The US submarine community wants to exercise with Canadian SSK's for training, and the Rand Corporation clearly identified the need for this cooperation. This obviously has tremendous benefit for the training of Canadian submariners in sub verses sub operations.

Recently, a major combined naval exercise in the Pacific concentrated on the ASW mission. During Exercise RIMPAC 2002, the focus was on ASW, a departure from previous exercises.[63] Not unexpectedly, the performance of the ASW forces that participated in this exercise was assessed to have improved greatly throughout the intense training program. This exercise proved the value of coordinated training, and emphasized the vulnerability of surface units to all types of submarines.[64] Training exercises such as this must be conducted with greater frequency and Canadian SSK's will provide valuable support.

Another benefit to having boats in MARPAC is that they would be able to pursue an active testing and evaluation program at the Canadian Forces Maritime Experimental and Test Ranges (CFMETR), located approximately 150 kilometres north of Victoria.[65] The testing and evaluation of ASW equipment and systems is a key mission for CFMETR, and has included the extensive testing and certification of the Victoria Class, Submarine Fire Control System (SFCS).[66] Tactical Development (TACDEV) of ASW systems, weapons and platforms are also key missions of CFMETR. Conversely, submarines from Halifax must deploy to the Caribbean to exploit comparable facilities.

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[63] RIMPAC exercises were traditionally focussed on operations involving aircraft carriers. The wars against terrorism and Iraq prevented the US from providing a carrier in RIMPAC 2002.
[64] Phil Eggman, "Focusing on ASW in RIMPAC 2002", *Undersea Warfare*, Fall 2002: 8-10.
[65] CFMETR is an underwater test range located about 150 kilometres north of Victoria that was established in 1965. It is a joint Canadian US facility that is used heavily by USN SSN's for testing and tactical development. It is a fully instrumented 3-D range that is capable of conducting the full range of events in support of training, testing and evaluation. CFMETR is also ideally located close to the Sea King base in Victoria and the MPA Squadron located at CFB Comox. The convenience, efficiency and flexibility of CFMETR cannot be understated. In Halifax, the closest comparable facility on the east coast is located in the Caribbean.

Some may wonder why Canada should place any submarines in MARPAC. These opinions were of value during the Cold War, but today, the changes in the world warrant a review of the placement of our resources. Without submarines, MARPAC will be unable to conduct ASW training unless the USN or another nation could spare a submarine. Given the reduction of USN submarine forces, and their demanding deployment cycles today, this is becoming less likely. Without submarines, MARPAC's ASW forces will be unable to complete their annual CFCD 102 training requirements, specifically the advanced requirements that require the participation of more than one submarine. This problem has been common in MARPAC for several years, and it is time for a positive change. The status quo of previous years is no longer acceptable given the importance of training for the submarine threats of today.

While one submarine might be capable of fulfilling the basic training needs of MARPAC's ASW forces, there may not be any sea-days remaining for the many other missions for which the submarine could be tasked. This is an unacceptable limitation.

MARPAC needs a minimum of two submarines to ensure there are sufficient resources available to train ASW forces. This training will include the conduct of worthwhile testing and evaluation programs at CFMETR in support of naval requirements, and the submarine specific training opportunities that are available with the USN. This training resource must be available to the navies of Canada and the US more frequently than can be supported with a single boat.

The final reason why submarines are necessary is for the conduct of maritime patrols, whether overt or covert, in local waters or abroad. The Canadian Forces mission is, "To protect Canada, to contribute to world peace and to project Canadian interests and values abroad."[67] Canada's naval forces, including submarines, are well suited to conduct this full range of tasking. As a maritime nation, government policies have been designed to ensure the security of our ocean regions. Canada's marine and ocean industries contribute billions of dollars to our gross domestic product, and create

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[66] This evaluation consisted of installing a complete Fire Control System on a barge at the range, and conducting live firing of MK 48 torpedoes.

[67] Department of National Defence, MCP(1) *Naval Doctrine Manual*, (Toronto: CFC, 2000), pg 5-5/21.

hundreds of thousands of jobs.[68] Our territorial waters have rich biological and physical resources, which Parliament has legislated to exploit and protect.[69] Surveillance of Canada's territorial waters to protect our legal claims has always been a primary mission of the navy, and military platforms of all types, including submarines, have conducted these sovereignty patrols.

Radar, electronic eavesdropping, satellites, and coastal patrols by naval units or aircraft allow countries with this technology to know with a certain degree of confidence who is transiting near their shores. For a sustained covert ISR mission, the best platform for this assignment is a submarine. In MARPAC this has not been possible for almost thirty years. Now it is important to commence submarine patrols of waters within the MARPAC AOR, and establish a military presence below as well as on the ocean's surface.

Unlike an SSN with unlimited range and high speed, SSK's could be viewed as a vessel of position. Their speed and endurance limitations prevent high-speed transits of unlimited distance. This limitation restricts their flexibility, but due to their size and their quietness while on batteries, they are well suited for operations whether off homeland shores, or the shores of another country.[70] The Victoria Class is a small submarine by modern standards.[71] The boat's size, design and technology make it extremely difficult to detect, even when snorting to charge batteries. Overall, the *Victoria* is assessed to be an extremely capable submarine, ideal for operations in the challenging environment of the littoral.[72] Given the wide differences in sea areas that a submarine must patrol off

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[68] Kenneth White, *Economic Study of Canada's Marine and Ocean Industries*, Report Prepared for Industry Canada and National Research Council Canada (Manotick: Acton White & Associates, 2001), 3.
[69] The Canadian Department of Fisheries and Oceans, *Canada's Ocean Strategy: Our Oceans, Our Future*, (Ottawa: DFO Canada, 2002), 1.
[70] A modern SSK has significant endurance limitations. An SSK's source of power when submerged is batteries. These batteries need to be charged frequently, and this is facilitated by coming to the surface, or near surface, to conduct battery-charging operations with the boats diesel engine. The submerged battery endurance of a submarine is directly related to the speed that is employed when submerged. That is, faster submerged speeds require more frequent periods of diesel operation. The use of a snorkel, an intake/exhaust pipe that is extended to the surface much like a periscope, will allow a submarine to charge her batteries when operating at periscope depth. New technological advances in Air Independent Propulsion (AIP) will allow for significantly increased endurance for SSKs.
[71] A Victoria Class submarine has a displacement of approximately 2,400 tons. Other SSKs such as the Australian Collins Class displace 3,400 tons. Russian Kilo Class submarines displace 3,100 tons. To put this in perspective, a USN Los Angeles Class SSN displaces 8,000 tons.
[72] Jonathon Powis, "U.K.'s Upholder-Class Subs go to Canada", *United States Naval Institute, Proceedings,* October 2002: 100-102.

Canada's West Coast, this will be of tremendous value. Whether patrolling deep water off the continental shelf, the shallow approaches to the mainland, inland fjords, or around the many islands that lie off the coast, the Victoria Class is well equipped.

In addition to the expected military roles, naval vessels of all types also have a constabulary role, particularly when operating in Canadian waters.[73] MARPAC's past experiences with drug traffickers, migrant smugglers, polluters and fisheries violators have highlighted some of the taskings in which a boat might have been effectively utilized. In 1993, *HMCS Ojibwa* conducted a fisheries patrol off Nova Scotia with an embarked Department of Fisheries and Oceans (DFO) officer. The declassified reports indicate that despite some minor problems, "Submarines have a greater ability than current DFO platforms to covertly detect, track, identify and monitor fishing vessels, day, night and in fog."[74] The employment of Halifax based Oberon Class boats in the 'Turbot War' with Spain, and in counter-drug operations further validates their utility in support of the security of our oceans.[75] Ultimately, the threatened presence of a Canadian submarine, in the MARPAC AOR could cause those who intend to conduct or participate in illegal activities to alter or change their plans.

In addition to covert operations in support of other government departments as previously described, submarines are needed to guard against the presence of submarines of other navies, such as Russia who continue to operate boats off North American coasts.[76] The *Victoria*, with her much improved sensor suite, will prove to be indispensable in fulfilling this commitment in the future.[77]

The security of our coastal regions is a key responsibility of Canada's maritime forces. As stated in *Leadmark*:

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[73] Department of National Defence, *Leadmark:The Navy's Strategy for 2020*…., 35-41.
[74] Department of Fisheries and Oceans, *The Potential of a Submarine in Fishery Surveillance and Enforcement*, (Ottawa: CFN Consultants, 1993), 5.
[75] F.W. Crickard, "Submarines for Canada – Strategic Implications", *Maritime Affairs*, Available from http://www.naval.ca/article…rd/submarinesforcanada_byfwcrickard.htm; Internet; accessed 7 May 2002.
[76] Andrew C. Richter, ""Alongside the Best"? The Future of the Canadian Forces", *Naval War College Review*, Volume LVL, No. 1, (Winter 2003): 86.
[77] The Victoria Class was never designed to operate under the ice in Canada's Arctic. They are assessed to have a "limited near ice edge" capability. Future modifications to the boats would be required to give the boats the ability to operate in the Arctic. See: VAdm G.R Maddison., *Victoria Class Submarine Interim Concept of Employment Guidance: An Instrument of Canadian Policy*, MARC:3000-0, (DMARSTRAT), 28 May 99.

> In the absence of any major conventional military threat to North America, the primary sovereignty - related function of Canada's naval forces will continue to be patrols of our vast maritime approaches. This may extend to assisting other government departments (OGDs) in protecting and managing Canada's natural resources in the Atlantic, Pacific and Arctic Oceans, as well as interdicting goods or people attempting to enter Canadian jurisdictions illegally by sea or air.[78]

Submarines have proven their ability to perform support missions in the past. Not having this capability in MARPAC has restricted the options available to the Commander in the assignment of resources to particular missions. Canada's western sea approaches are important to Canada with thirty-six percent of Canada's international sea borne trade transiting through the MARPAC AOR.[79] The importance of this must be acknowledged with the assignment of appropriate naval resources, including submarines to MARPAC.

Without submarines, MARPAC will be unable to conduct covert ISR missions of extended duration either locally or abroad. Furthermore, MARPAC would be hard pressed to keep abreast of the movement of other submarines within the AOR.[80] Canada cannot expect her allies to provide for the security of her vast sea approaches. This is the government's legal and moral responsibility. Resources must be apportioned to MARPAC to provide the tools needed to secure our interests in the Pacific.

One submarine will be insufficient, as it will not provide a permanent capability given the limitations in availability. Furthermore, a single boat will have other primary missions. MARPAC requires a minimum of two boats to ensure it can deploy when needed into the Pacific Ocean.

Another key advantage for having two boats is commonality of parts, equipment, and personnel. Having two boats will provide some redundancy for the sustainment of operations given the advantage of having an identical platform available in the event of an equipment or personnel casualty.

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[78] Department of National Defence, *Leadmark*…, 97.
[79] The Navy League of Canada, "Canada, An Incomplete Maritime Nation", (2003), 23. Available from http://www.navyleague.ca/eng/ma/papers/2003 Navy League Policy Paper.pdf; Internet; accessed 5 May 2003.
[80] As an 'operator' of submarines, MARPAC HQ will have a direct, professional relationship with the USN for the conduct and movement of submarines in the region. See: *VICTORIA Class Submarine Support Plan…,* Annex A-5/14.

In summary, the assignment of one submarine to MARPAC is a welcome step forward in terms of improving the capabilities of the West Coast Navy. Regrettably, this single submarine will be insufficient to support all the demands that will be placed on it.

The Pacific Ocean area has become a region of critical importance to Canada. MARPAC needs a minimum of two submarines to be an effective participa88.Tm(arines to)Tj0.00026s5014

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