

Parry and Thrust: Canadian Maritime Forces and the Defence of North America, 1954-62

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Le Canada, entre 1954 et 1962, a transformé le rôle et les capacités de ses forces maritimes autant navales qu'aériennes, en délaissant la protection de la navigation vers Europe dans un contexte de guerre conventionnelle, au profit de la chasse des sous-marins soviétiques équipés de missiles à tête nucléaire. Le nouveau rôle a exigé de nouveaux systèmes d'armes sophistiqués, y compris les munitions nucléaires anti-sous-marins. Cette transformation faisait partie d'un changement des plans militaires Canada-États-Unis et de l'Organisation du Traité de l'Atlantique Nord pour décourager l'attaque nucléaire soviétique en créant des défenses plus efficaces contre les forces soviétiques disposant d'armes nucléaires.

- True defensive means waiting for a chance to strike
- The strength and the essence of the defensive is the counter stroke
- A general defence policy may consist of a series of minor offensive operations.

Corbett, *Some Principles of Maritime Strategy*

The overall concepts governing the conduct of war as envisioned by the members of the North Atlantic Treaty Organization altered considerably between 1952 and 1954. The effects of this alteration included the creation of a vast deterrent system consisting of strategic, theatre and tactical nuclear forces; tactical and strategic warning systems; conventional forces and civil defence forces. Each NATO member contributed a component or several components to this deterrent system, the aim being the formation of a credible means of warfighting to convince the main adversary that attempts to force war on the West would fail. Canada, as a geographically and politically critical member of NATO, chose to contribute most of her maritime forces¹ as a role-specific component within the deterrent system. The integration of this component into the deterrent system has received scant attention, unlike its air defence or attack at source counterparts. This paper will examine how the Royal Canadian Navy and the maritime component of the Royal Canadian Air Force adapted to the new strategic environment between 1954 and 1962.

¹ I have used the term “maritime” instead of “naval” in recognition of the fact that long range maritime patrol and other aircraft were a critical element in the Canadian ASW effort alongside ships and submarines.

Canada was a member of two formal defensive arrangements, each possessing maritime components: the North Atlantic Treaty Organization (NATO) and the Canada-U.S. Permanent Joint Board on Defence (PJBD). Prior to 1954, Canadian maritime forces operated under national control within the framework of the PJBD or under NATO control in wartime under the NATO command Supreme Allied Commander Atlantic (SACLANT). In broad terms, Canadian forces operating within the PJBD framework were responsible for coastal defence operations within Canadian territorial waters while forces “chopped” to SACLANT operated with other NATO forces in sea lines of communications (SLOC) protection missions. Canada also controlled a sector of the western Atlantic Ocean under SACLANT. There was some ambiguity over the PJBD command arrangements since part of the PJBD, the Military Cooperation Committee (MCC) (the military component of the PJBD) also functioned as the Canada-U.S. Regional Planning Group (CUSRPG) in NATO. The CUSRPG functioned as the liaison between Canadian and American forces defending North America between these forces and the NATO forces operating in the Atlantic Ocean under SACLANT.²

The Canadian maritime force structure between 1949 and 1954 was based primarily on Second World War-built ships and aircraft utilizing Second World War technology and tactics. The Royal Canadian Navy (RCN) consisted of one light aircraft carrier, HMCS *Magnificent* operating Sea Fury propeller driven fighters and Avenger anti-submarine aircraft; two cruisers (the *Ontario* and *Quebec*); 11 Tribal and “V”- and “C”-class destroyers; 16 Prestonian-class ASW frigates; 9 Algerine coastal escorts and 8 Bay-class minesweepers. The Royal Canadian Air Force's (RCAF) Maritime Air Command (MAC) operated the Lancaster aircraft in the maritime patrol role. There were three Maritime Reconnaissance squadrons, 404(MR) Squadron, 405(MR) Squadron and 407(MR) Squadron, each consisted of 20 aircraft. In terms of deployment, practically all of the RCN's ships and two RCAF squadrons were located on the Atlantic coast while a small number of coastal craft and one RCAF Lancaster squadron were based on the Pacific coast (this patrol squadron was committed to SACLANT in wartime). Additionally, the RCN operated a high frequency detection finding (HFDF) system and a signals intelligence system in support of Canadian maritime operations.³

The type of war that Canadian maritime forces were prepared for up to 1954 was similar to that encountered during the Second World War, that is, a conventional anti-submarine warfare campaign. In essential terms, the ASW carrier group was to become

² Canada was also a member of the more informal CANUKUS agreements. These were standardization arrangements between Canada, the UK and the US in the areas of weapons, signals and doctrine.

³ Canadian Department of National Defence, Directorate of History and Heritage [hereafter DHH] Naval Board Minutes [NBM], 415th meeting (17 Sep 54); W.I. Clements, “he Evolution and Current Status of Maritime Air Command,” *Roundel*, 3 no 8 (Oct 1961), 2-9. During the Korean War, Canada continuously deployed three of its eleven Tribal-class destroyers to Korean waters, thus reducing the number available in the Atlantic to eight. For information on HFDF and Supplementary Radio Activity stations, see NBM 569th meeting (30 May 58), enclosure No. 1.

part of SACLANT's offensive hunter-killer forces which amounted to five ASW carrier support groups in the Eastern Atlantic: two US, one UK, one Dutch and one Canadian. Canadian destroyers and frigates would provide close escort of convoys carrying reinforcements to Allied Command, Europe while the coastal defence ships handled inshore ASW and mine countermeasures. MAC was prepared to support all three missions but was limited by the range of the maritime version of the Lancaster aircraft which was not trans-Atlantic.⁴

The changing strategic environment between 1952 and 1954 prompted both the United States and Canada to re-assess measures taken to defend North America in the event of a global war. Previously, the ability of the Soviet Union to attack North America was limited to one way missions with TU-4 bombers and mass airborne drops on Alaska or Iceland so that TU-4's could perform two way missions. These were manageable problems requiring a minimal outlay in Canadian and American land and air forces.⁵ The combination of the hydrogen bomb and intercontinental bomber aircraft, coupled with a more technologically sophisticated and longer-ranged Soviet submarine fleet and the development of submarine-launched missiles, meant that North America was more likely to be attacked effectively in the event of war.

The Canadian assessment of North American vulnerability coupled to the intimate links developed with the Americans through the PJBD set the pace of Canadian continental defence programmes. Canadian and American planners envisioned a conflict in which success depended on protecting two things; the North American bases housing the United States Air Force's (USAF) Strategic Air Command (SAC) bombers; and the natural and manpower resources of Canada and the United States. If SAC's bombers were vulnerable in peacetime, an attack against them was more likely and deterrence was diminished. If the North American mobilization base was vulnerable, the ability of NATO to prosecute a war in Europe was also diminished. Both components were critical to deterrence within the alliance system established in 1949. Thus, the planners established a group of critical and vulnerable areas in North America and developed a variety of options to defend them.⁶

This process was not a coherent one. Many governmental agencies and armed services from both countries proceeded along different paths in an attempt to develop a comprehensive continental defence system. Fortunately, the RCN and the RCAF were included in many of the American study groups examining continental defence issues. This was only prudent if Canadian maritime forces were to keep abreast of American developments. The relative small size of Canadian forces compared to their

⁴ DHH, Canadian Chiefs of Staff Committee Minutes, 543rd meeting (15 Sep 53), "Deployment of HMC Ships Under SACLANT."

⁵ DHH, 112.3M2(D400) (27 Dec 49) memo to Brigadier Commander Designate AFBG HQ, "Employment of the Mobile Striking Force in the reduction of Enemy Lodgements in Canada"; (1 Nov 49) "Appreciation on the Employment of the Active Force Brigade Group in the Defence of Canada."

⁶ DHH, Chiefs of Staff Committee, minutes of the 569th meeting (2 Nov 54).

American counterparts dictated that some compatibility should exist, though purely Canadian defence requirements remained paramount.⁷

The result of this flurry of activity was the implementation of a number of continental defence programmes, not all of which were coordinated. These included a number of radar systems like the Distant Early Warning Line (DEW Line) in the Canadian Arctic and the Mid-Canada Line across the Canadian Shield; Canadian and American air intercept forces including manned fighters and surface to air missiles coordinated by Semi-Automatic Ground Environment (SAGE) computers; and point missile defences located near specific high-value targets. Eventually, U.S. radar picket ships and aircraft were also added to cover gaps. Canada chose not to participate in the sea-based radar picket system for budgetary reasons.⁸

These were primarily air defence systems given the fact that the immediate primary and confirmed threat was from Soviet bomber aircraft carrying hydrogen bombs. The missile launching submarine threat was not confirmed. This threat was projected to exist in the near-future and thus measures to confront it within the context of the air defence system were considered secondary by the study groups. This, however, did not prevent the RCN, RCAF and the USN from developing programmes to deal with it as well as the existing submarine threat to NATO SLOC's.⁹

One ASW technique already in use in the early 1950's was the ASW barrier. Barrier operations utilized ASW ships, patrol aircraft (and later submarines)¹⁰ in a series of extended picket lines in the ocean, with each ASW unit assigned to a particular "box." Any enemy submarine transiting through the barrier was theoretically subject to coordinated attack as it passed through the "boxes." Canadian and American ASW forces regularly practiced barrier operations in the 1950's. The problem was strategic detection. It took time to put such a barrier in place and keep it there.

The most important ASW programme was the exploitation of Low Frequency Analysis and Recording (LOFAR) techniques to track submarines. Though equipment using LOFAR would eventually be incorporated into surface ship and submarine SONAR and aerial-delivered sonobuoys, the most important application was in the form of

⁷ For example, the RCN participated in the groundbreaking Project LAMPLIGHT, a study group from which most of the continental defence system programmes were derived. See DHH NBM, 424th meeting (10 Nov 54) and 430th meeting (22 Dec 54), "LAMPLIGHT."

⁸ See Joseph T. Jockel, *No Boundaries Upstairs: Canada, The United States and The Origins of North American Air Defence, 1945-1958* (Vancouver: UBC Press, 1988) Ch. 4; U.S. Navy Operational Archives [hereafter USN OA] Strategic Plans Division box 279, folder A1 (6 Jan 53) memo CinCUS Atlantic Fleet to CNO, "Naval Picket Forces, Atlantic and Pacific"; box 300 folder A16-1, (1 Dec 54) CNO to JCS, "Military Characteristics of the DEW Line At Sea."

⁹ DHH NBM, 430th meeting (22 Dec 54), "LAMPLIGHT." One of the options in the LAMPLIGHT study specifically examined the creation of an underwater sound surveillance system.

¹⁰ Coordinating friendly submarine operations with the aircraft and surface ships posed significant problems.

underwater listening arrays. Generically called Sound Surveillance Systems or SOSUS, two parallel programmes existed in the West in 1953-54: the British CORSAIR system, which was a shallow water array with a projected range of 100 miles, and the American CAESAR system, which was a deep water system with a projected 1000 mile range.¹¹ The RCN had representatives observing the development of the CORSAIR system and had also assisted the U.S. Navy and the contractor, Bell Telephone Laboratories, in aspects of the CAESAR system.¹²

The U.S. Navy commenced building the CAESAR system around 1954, with six stations on the Atlantic coast and three on the Pacific coast completed and operational by 30 June 1956. The RCN was kept informed on CAESAR developments and, in 1954, the U.S. Navy requested permission through the PJBD to establish a joint Canadian-American CAESAR station to cover the southern Canadian Atlantic coast. After some bureaucratic discussion over cost, Station Fox was established at Shelburne, Nova Scotia, bringing the total stations on the Atlantic coast to 12 by 1958. The northern section of the Canadian area was already covered by an American station located at Argentia, Newfoundland. Argentia was, by virtue of the Second World War destroyers for bases deal, an American naval base.¹³

The SOSUS systems figured prominently in the development of Canadian maritime planning in defence of North America. Here was an underwater equivalent to the DEW Line: what force structure should be formed to exploit it? What national resources should be allocated to construct a coherent Canadian ASW system given the existing emphasis on air defence systems? It was certain that existing ASW systems like the Tribal- and other Second World War-era class destroyers and Lancaster maritime patrol aircraft were obsolete.

A number of factors provided an impetus to changing this state of affairs. On 22 November 1954, NATO members, including Canada and the United States, accepted a new strategic concept for planning purposes. This strategic concept, known as MC 48, drew on previous planning assumptions already established between Canada and the United States. The pattern of war postulated by MC 48 consisted of two phases. The first

¹¹ The actual operational ranges of the CAESAR systems was, in the early days, considerably less. Environmental conditions such as salinity and temperature, in addition to the lack of high speed data processing, produced a web-like surveillance capability instead of an absolute capability for the areas covered by the stations.

¹² Library and Archives Canada [hereafter LAC] RG 24 Acc 83-4/167 vol 11, 129 file ACT 11279-11, (12-14 May 54) Minutes of the Eleventh Senior Officers Conference; RG 24 vol 11 275 file AC 1279-1 vol 3, (1 Aug 60) "COMOCEANSYSLANT Notice 5050"; DHH, Raymont Collection file 1087, (28 May 64) "Project CAESAR"; NBM 418th meeting (5 Oct 54).

¹³ U.S. National Archives [hereafter USNA] RG 59 Box 6, (3 Feb 56) "Record of Activities leading Toward Establishment of Sound Surveillance Stations on the East and West Coasts of Canada"; USN OA, "Annual Report of the Commander in Chief U.S. Atlantic Fleet, 1 July 55 to 30 June 56"; "Annual Report of the Commander in Chief U.S. Atlantic Fleet, 1 July 1956 to 30 June 1957."

phase was a period of nuclear exchange, perhaps lasting up to 30 days, or until one side (presumably the Soviets) had expended its nuclear arsenal. The second phase was conventional in nature and undetermined in temporal scope. The war would be completed on conventional terms after infrastructure had been rebuilt and manpower and resources mobilized. Critical operations in the first phase included the protection of NATO's nuclear striking power (specifically SAC) so that the maximum damage could be inflicted on the Soviet Union. Secondly, operations contributing to the limitation of damage to the North American mobilization base were critical so that the resupply and reconstruction of Europe and the conventional defeat of the Soviet Union could occur in the second phase.¹⁴

This new strategic concept functioned as an anchor for developing Canadian maritime capabilities. It was also endorsed by Canada's senior military leadership who were considering the acquisition of offensive support forces to complement SOSUS. Many planners believed that these components were critical to the deterrent system and that resources had to be allocated to create them.¹⁵ These views eventually became official Canadian policy. With the usual budgetary constraints on defence programmes, Canadian "government policy is to give priority to those projects which will lessen the chance of NATO losing the war in the first 30 days..."¹⁶

Offensive support forces for underwater surveillance systems fell into this category and were insured funding over other naval programmes like maintaining a reserve fleet of near-obsolete ASW frigates. It should be noted here that some modernization programmes, like the St-Laurent-class ASW vessel and P2V Neptune patrol plane were already underway and were not specifically driven by this policy change. Follow on ASW systems did, however, result to some degree from it.¹⁷

By mid-1955, Canadian naval planners commissioned a study to assist in developing a future force structure. The resulting document, the Seaward Defence Report, supported the acquisition of offensive support forces to operate with the CAESAR system in the Canadian Atlantic Sub Area. The report also recommended the establishment of a CORSAIR system to handle coastal area surveillance. The recommendations of the Seaward Defence Report were incorporated in the 1956-57 Naval Programme. The 1956-57 Programme allocated seven of the still-building St Laurent-class ASW ships as offensive support forces for the CAESAR station at Shelburne and for a second planned station on the east coast. The other seven St Laurents

¹⁴ DHH NBM, (28 Nov 55) "The Requirement for a Re-appraisal of Current War Plans."

¹⁵ DHH, NBM (26 Oct 55) "Chief of Staff Committee Briefing."

¹⁶ DHH, NBM, (17 Nov 55) memo VCNS to CNS, "Final Screening Committee."

¹⁷ The concurrent development of the St Laurent-class is beyond the scope of this paper. An interesting examination of the Canadian shipbuilding process which includes the DE 205 programme is Michael A. Hennessy's "The State As Innovator: Controlling the Command technology for Warship Construction in Canada, 1949-1965," in *Canadian Papers in Business History*, ed. Peter A. Baskerville (Victoria, BC 1993), 147-77. For more on the Neptune acquisition, see LAC RG 24 file 20710 csc 2-3-2, memo to the Cabinet Defence Committee (26 Nov 53) "Maritime Aircraft for the RCAF"; DHH 73/731 (n/d) "Maritime Air Command."

were to replace the existing Prestonian-class frigates in the ocean escort role or they could act as offensive support forces for the second CAESAR station. For inshore ASW operations, the programme included a requirement for the development of offensive support forces for the projected CORSAIR system; these forces were to be ASW helicopters equipped with dipping sonar and operating from land bases. Unlike previous studies, the Seaward Defence Report and the 1956-57 Programme recognized that nuclear ASW weapons were under development in the United States and that there would, in the future, be a definite requirement for Canada to acquire them in order to increase the effectiveness of the offensive support forces operating with the CAESAR and CORSAIR system against Soviet submarines.¹⁸

At this point in 1955, the RCAF and the RCN were still developing an ASW relationship. It had not been a close relationship and the acquisition of the long range Neptune maritime patrol aircraft was not coordinated at all with ongoing naval developments. The Lancasters were old and desperately needed replacement. In late 1955, two of the three maritime reconnaissance squadrons were flying Neptunes on the Atlantic coast. The improved RCAF capability in this area stimulated some changes. Significantly, a joint RCN/RCAF "Sea-Air Warfare Committee" was created by 1956 to develop closer interservice communication on ASW issues.¹⁹

Before the RCN and the RCAF could develop a joint ASW concept of operations, Canadian maritime commanders had to reassess the employment of the fleet. As noted earlier, the primary role of the RCN was SLOC protection under SACLANT, with the secondary role of coastal protection under the PJBD or CUSRPG. The new NATO strategic concept was ambiguous in its discussion of naval force employment but as we have seen, the Canadian government chose to emphasize forces which would contribute to the first phase (nuclear war fighting) at the expense of those contributing to the second phase (reconstruction, resupply and conventional operations). There was a larger context to the Canadian reassessment. As early as November 1954, Britain's Admiral McGrigor told Canada's naval leadership that the United States focused too much on "atomic bombardment aspect(s) from the air and by guided missiles from submarines to the exclusion of progressing plans to keep shipping lanes open and fight a submarine threat."²⁰

McGrigor's concern was a legitimate one. The U.S. Navy was, at this time, in the process of re-allocating no fewer than 44 destroyers and destroyer escorts from the EASTLANT and IBERLANT areas in SACLANT to the WESTLANT area. The British believed that stripping ASW forces from the areas closer to Europe was an indication that the Americans might abandon Europe altogether in a nuclear war and choose to protect just North America. The British, at this point, were not convinced that there was or even would be a missile launching submarine threat. They did not believe that the CAESAR system was effective enough. They firmly believed that the best system was a CORSAIR

¹⁸ DHH NBM (25 May 55) "Seaward Defence Report," "1956-57 Programme."

¹⁹ DHH 73/731 (n/d) "Maritime Air Command."

²⁰ DHH NBM 423rd meeting (9 Nov 54).

chain and offensive support forces situated in the Greenland-Iceland-UK Gap instead of a similar system located on the eastern coast of North America.²¹

Canadian reactions were mixed. Canada had allocated most of its defence resources to a damage limitation strategy. The maritime forces had been directed to focus on first phase operations designed to preserve the deterrent and the mobilization base. Now maritime planners had to steer a course between two differing allied conceptions of how a maritime war would be fought against the Soviets in the future. The American position was to use nuclear weapons delivered from aircraft carriers against Soviet submarine bases and construction facilities and then destroy those operating in the Atlantic with hunter-killer ASW carrier groups using information provided by CAESAR. The British conception included the use of nuclear weapons against Soviet bases but instead emphasized an extensive mining campaign off Norway, close convoy escort in the Atlantic, as well as the use of hunter-kill forces in the GIUK Gap supported by CORSAIR information.

The 1956 report of the (Canadian) Naval Warfare Study Group reflected on these positions. It also noted that Canadian maritime forces were allocated to NATO SACLANT, not a British command, and the probability of the British point of view dominating in that organization was low. SACLANT's existing concept of operations was closer to the American perspective than the British one and after some debate, Canada's naval leadership chose to align themselves with SACLANT's planning. This planning did recognize the need for SLOC protection and convoy operations, but: "SACLANT had a three-fold task in respect to the threat of atomic attack by Submarine Launched Guided Missiles: (a) to mount an attack against the USSR submarine bases, (b) to prevent submarines from entering the Atlantic and, (c) to destroy submarines escaping (a) and (b) before the submarines get within firing range of North America to launch guided missiles..."²²

This much was said in a SACLANT study, "Pattern of Naval Forces for NATO Control of the Atlantic During the Next Decade" (1956). With these factors in mind, the RCN and the RCAF set about developing an equipment programme and a joint concept for maritime operations.

The "RCN/RCAF Concept of Maritime Operations" was agreed to by both services and approved by higher authority by 17 April 1957. This concept was designed to serve as a basis for

force levels and equipment requirements and, since it was issued during the initial re-organization of maritime forces under Maritime Commanders, it served as an initial guidance document until such time as the integrated

²¹ DHH, NBM (26 Oct 55) "Chief of Staff Committee Briefing"; UK, The National Archives, Public Record Office, Kew [hereafter PRO] ADM 205/102 (7 Jan 54) memo from Hughes-Hallett to First Sea Lord, "Submarines and Guided Missiles Against the United States"; (20 Jan 54) VCNS to First Sea Lord, "Submarines and Guided Missiles Against the United States."

²² DHH, NBM (23 May 56) "Report of the Working Group of the 1956 Naval Warfare Study Group."

Maritime Headquarters could complete their own evaluation of the threat and develop concepts of operations to supercede this basic document...²³

It also took into account the existing NATO strategic concept MC 48, SACLANT's views on Atlantic operations and Canadian defence policy's emphasis on first phase operations within the MC 48 concept.²⁴

The threat estimate presented in the concept was based on 31 and 17 enemy submarines operating off the Canadian Atlantic and Pacific coasts respectively. A number of these submarines were considered to be missile launching submarines. Projected enemy operations included attacks on naval and merchant shipping with conventional and nuclear weapons; the use of conventional and nuclear mines in harbours and coastal areas; and the use of surface to surface missiles against land targets. The concept also made provision for enemy "trojan horse" merchant ships operating either missiles or engaged in nuclear minelaying.²⁵

The concept noted that 30 percent of U.S. warmaking capacity was located within 100 miles of the coasts in question. It also noted that: "It is expected that Soviet naval forces will use modern weapons; the Soviet naval weapons which could be readily deliverable in 1960 pose a most significant threat to that portion of the atomic striking forces of the United States and the combined war-making potential of Canada and the United States..."²⁶

The threat estimate was based on the probability that the enemy missile systems possessed a 500 mile range and could be command guided for the first 200 miles after launch. The probable launch time for the missiles was 5 to 15 minutes after surfacing.²⁷

Projected targets within Canadian areas of responsibility on the Atlantic coast included the SAC base at Thule, Greenland and a SAC dispersal base at Sonderstrom; interceptor and SAC nuclear storage/dispersal base at Goose Bay, Labrador; the SAC tanker base at Harmon Air Force Base (AFB) in Newfoundland; the critical port facilities located at Montreal and Halifax; the U.S. Navy base (including nuclear ASW storage and a SOSUS site) at Argentia, Newfoundland; the airbase at Torbay, Newfoundland and the port of St. John's, Newfoundland. Enemy submarines had to transit through the Canadian area of responsibility to attack SAC bases located at Loring AFB in Maine; Pease AFB in New Hampshire; Plattsburg AFB in New York; Griffiths AFB also in New York; and Westover AFB, Massachusetts. On the Pacific coast, Canadian planners had a smaller area to deal with and were primarily concerned about protecting the port of Vancouver and the naval base at Esquimalt in Canada, and the port of Seattle in the U.S.²⁸

²³ LAC RG 24 vol 1 098.105 (7 Apr 60) CAS to AOC MAC "RCN/RCAF Concept of Maritime Operations."

²⁴ DHH 74/723 (2 April 57) "RCN/RCAF Concept of Maritime Operations"; LAC RG 24 box 21073 file 1242-3 v.1, (25 Apr 57) memo CAS to Sec, Chiefs of Staff, "RCN/RCAF Concept of Maritime Warfare."

²⁵ DHH 74/723 (2 April 57) "RCN/RCAF Concept of Maritime Operations."

²⁶ Ibid.

²⁷ Ibid.

²⁸ Ibid.

That said, Canadian maritime “force patterns which will be derived are those necessary for the successful conduct of general nuclear war with the Canadian contribution geared to the protection of North American coasts.”²⁹

Defence plans envisioned three defensive zones. The “Denial Zone” extended 200 miles out from the coast and met the “Inner Combat Zone,” which extended from 200 miles to the maximum effective CAESAR range. Beyond this was the “Outer Combat Zone.” These last two zones would have barrier forces operating in them. The Canadian concept assumed that there would be three such systems: one off of the northern Norwegian coast, another in the GIUK Gap and a third extending from the coast of North America into the Atlantic Ocean. The Pacific was just too big for natural barrier areas. As a result, most of the projected Canadian maritime force structure was designed to fight within the Inner Combat Zone on the Atlantic Coast and in an equivalent zone in terms of distance on the Pacific Coast, an area which assumed greater importance given the missile threat. The Atlantic zone conformed to the Canadian Atlantic Sub-Area. Other NATO naval forces and some long range Canadian ASW forces would handle operations in the Outer Combat Zone in the Atlantic. According to the concept, Canada would not participate in GIUK Gap or Norwegian Sea ASW operations.³⁰

Force structure improvements necessary for the effective implementation of the concept were well underway by 1957. After the ratification of the MC 48 concept in 1954 and concurrent with the Seaward Defence Report and preparations for the 1956-57 Programme, the Canadian Chiefs of Staff Committee affirmed that, given the new threat potential,

it was considered essential that naval ships and aircraft should be well-armed...both ships and aircraft should have the best that can be provided both in anti-submarine and anti-aircraft weapons....current naval plans have been designed to fit NATO and national commitments. The RCN has considered the implication of nuclear weapons in maritime warfare and as a result has eliminated from their programme ships and weapons which would have marginal performance...³¹

Another important factor in the overhaul of Canada's maritime forces was the 1957 SACLANT Future Capabilities Plan, which incorporated the use of nuclear weapons in ASW operations. This study concluded that nuclear depth charges deliverable by all types of units should be in common supply. Canadian planners believed that “The lack of nuclear ASW weapons will make Canadian forces less effective and if it planned to introduce nuclear weapons into Canadian ASW forces by 1957, it is necessary to incorporate design changes in aircraft and ships at an early date...”³²

²⁹ Ibid.

³⁰ Ibid.

³¹ DHH Canadian Chiefs of Staff Committee minutes, Special Meeting (26 Oct 55).

³² NAC RG 24 acc 83-84/167 file 1270-78-1 vol 3, (5 Jan 56) RCN/RCAF Sea/Air Warfare Committee, “Nuclear Weapons for ASW.”

Nuclear ASW weapons were considered necessary for a number of reasons. The effectiveness of existing conventional ASW weapons against new Soviet submarine types was questionable, as was the ability of NATO ASW forces to localize them. Secondly, a conventional weapon might only damage a Soviet missile launching submarine and not destroy it before the missiles were launched. Thus, the improved kill capability of nuclear ASW weapons made them a desirable addition to Canadian maritime forces.

These views were endorsed by the Chiefs of Staff Committee. It was, however, too late to incorporate these changes into the St Laurent-class ASW ships, though the Neptune patrol aircraft were of American manufacture and had the ability to deliver nuclear ASW weapons inherent to their design.

HMCS *Magnificent*, the light aircraft carrier was getting on in age and her TBM Avenger ASW aircraft were obsolete. Steps were taken to procure a replacement carrier: HMCS *Bonaventure* joined the fleet on 21 January 1957 and 100 CS2F Tracker carrier-based ASW patrol aircraft replaced the Avengers. Formed into two squadrons, VS 880 and VS 881, the Trackers operated either from the *Bonaventure* in hunter-killer operations as part of an ASW task force or from shore bases. Trackers operating from shore bases functioned as offensive support forces for the Shelburne and Argentinia CAESAR stations. This technique was first tested in 1959 and replaced the previous concept of using helicopters with a CORSAIR system. CORSAIR did not have the range to operate outside of the Denial Zone, nor did the helicopters. Ultimately, the RCN did acquire Sikorsky Sea King ASW helicopters in 1963. These aircraft operated in groups from the *Bonaventure* and singly from later versions of the St Laurent-class ASW destroyers. Both the Trackers and the Sea Kings had the ability to deliver nuclear as well as conventional depth bombs.³³

Other changes to the surface fleet included retirement of the cruisers and the placement of the older frigates in reserve. Seven of the new St Laurent class ASW destroyers were operational by 1957. Their primary ASW weapon was the Limbo ASW mortar system, backed-up by homing torpedoes. Seven Restigouche-class and four Mackenzie-class ASW destroyers, follow-on classes to the St Laurent which used the same hull form, were in service between 1959 and 1962. Mine countermeasures and reserve forces were run down and priority resources given to those ships capable of offensive support activity.

Within the Canadian ASW concept, CAESAR stations provided offensive support forces with the general location of an enemy submarine. The offensive support forces then used their detection equipment to home in on the target and destroy it. There were other LOFAR applications in addition to the CAESAR shore stations. The use of sonobuoys in aerial ASW was not new but miniaturization and the LOFAR technique was

³³ "A History of the TRACKER," *Gulf Wings* (25 Aug 87), 31; DHH, "A Brief History of HMCS BONAVENTURE"; NAC RG 24 vol 11 147 file 1400-1 vol 1, (13 Oct 59) "CANCOMARLANT Trial Instruction 3/59: Control of CS2F TRACKER Aircraft"; Sean M. Maloney and Joel J. Sokolsky, "Ready, Willing and Able: The RCN and Nuclear Weapons, 1954-1970," unpublished conference paper presented to the conference on Canada and the politics of the nuclear era, 25-27 September 1992.

refined to the point where maritime patrol aircraft could operate them effectively. St Laurent-class ASW ships used their hull mounted sonar or a variable depth sonar for this, while the maritime patrol aircraft used sonobouys and magnetic anomaly detection.

The Trackers and Neptunes both carried LOFAR buoys and thus were fairly effective ASW platforms within the Canadian concept. The twin-engined Neptunes, however, were interim aircraft not wholly suited to Canadian operational and environmental requirements. The Canadian-designed and built CP-107 Argus was a huge four-engine patrol aircraft with incredible range, endurance and weapons capacity. It also carried LOFAR buoys and was capable of delivering conventional and nuclear depth bombs. Thirty-three Argus joined the RCAF between 1957 and 1960, replacing the Lancasters and Neptunes in 404 and 405 Squadrons at Greenwood, Nova Scotia. 407 Squadron at Comox, British Columbia, continued to operate Neptunes, while a new Argus squadron, 415 Squadron, was formed at Summerside, Prince Edward Island.³⁴

The deployment of Canada's maritime forces and in some respects their command relationships, changed significantly after 1957. At first glance, the Atlantic deployments which would come under SACLANT in the event of war remained constant. SACLANT received one ASW carrier, 18 ASW destroyers and 13 ASW destroyer escorts,³⁵ and 40-plus shore-based long range maritime patrol aircraft. The Pacific coast, which had in the past been more of a training area than an operational zone, received an influx of ASW forces specifically for counter-missile submarine operations. Instead of the small number of patrol vessels and the Lancaster patrol squadron, the Pacific command received seven ASW destroyers, five ASW destroyer escorts and a very large squadron of Neptune long range patrol aircraft.³⁶

Command relationships altered to match the shift in forces. The ambiguity between the PJBD, the CUSRPG and SACLANT still existed, though SACLANT was fairly straight forward. The RCN and RCAF earmarked (through NATO agreements) a certain portion of Canadian maritime forces to operate under SACLANT. These forces could either be used inside or outside the Canadian Atlantic Sub Area at the discretion of SACLANT; other national forces assigned to SACLANT could be "chopped" to the operational control of the Canadian commander handling this area, CANCOMLANT. This could conceivably include, say, a U.S. Navy hunter-killer carrier group or the U.S. Neptune squadrons operating out of Argentia, Newfoundland.

Other forces operating under national command in the defence of North America probably would have been coordinated through the CUSRPG instead of being placed under a joint Canadian-U.S. command similar to the North American Air Defence Command. Canadian maritime forces operating on the Pacific coast were subject to the

³⁴ W.M. Diggle, "Evolution of the ARGUS," *Roundel*, 10 no. 4 (May 1958), 2-5, 32; W.I. Clements, "The Evolution and Current Status of Maritime Air Command," *Roundel*, 13 no. 8 (Oct 1961), 2-9; "Canada's Vigilant Watcher," *RAF Flying Review*, XV no. 9, 25-28.

³⁵ The RCN changed their ship identification system in the 1950's. Frigates (FF's) became Destroyer Escorts (DE's), while ASW Destroyers were called DDE's.

³⁶ DHH NBM, 551st meeting (13 Nov 57), "Existing Allocation of HMC Ships."

ALCANUS defence planning body. ALCANUS (Alaska-Canada-U.S.) was a coordinating agency established through but not under the PJBD/MCC. Basically, Canadian maritime forces operating in the Canadian sector had direct communications links with the U.S. Navy Sea Frontiers in Alaska, Hawaii and the Pacific Coast. This also included the provision of CAESAR information to the Canadian Pacific command, as there were no arrays located in the Canadian zone. Pacific coast CAESAR stations were located in Hawaii and Adak, Alaska. Seven more were positioned on the U.S. West coast between the San Clamente Islands and Bremerton, Washington. American forces operating in the Canadian zone were "chopped" to Canadian operational control and the same applied to Canadian forces operating in the American zones.³⁷

This basic force structure and command relationships remained constant into the 1960's. By 1959 however, the concept of Canadian maritime operations changed. The existing close relationship between the RCAF, the RCN and the USN had by the late 1950's developed into a relatively open exchange of intelligence, weapons and doctrine. The highest Canadian and American maritime authorities maintained this relationship and were quite adamant about integrating Canadian and American ASW operations when and wherever possible.³⁸

One important exchange was the delivery of the U.S. Navy ASW policy to Canadian planners in 1959. Updated intelligence on projected Soviet missile submarine capabilities was instrumental in altering the American ASW concept. The Americans wanted to ensure that the enemy would not be able to exploit any gap (be it doctrinal or technical) between Canadian and American ASW forces. The two most significant changes were the inclusion of Soviet nuclear-propelled submarines into the enemy order of battle and, more importantly, the increase in missile range from 500 miles to 1500 miles.³⁹

The RCN and the RCAF rapidly reassessed their 1957 concept. By August 1959, the RCN and the RCAF concluded that the basic pattern of war established under MC 48

³⁷ USN OA Strategic Plans Division box 296 file A5 (8 Jul 54) letter, CNO to CinCPAC, CinCLANT; box 300 file A16-12 (n/d) ltr CinCPACFLT to CANFLAGPAC; box 300 A16-1, (21 May 54) letter CNO to CinCLANT; LAC RG 24 vol 11 771 S-1282-11 vol 6, (24 Apr 57) "Report of the ALCANUS Planners' Conference, 3-4 December 1956"; DHH 327.009(D339) (4 Mar 59) "Report on ALCANUS Conference."

³⁸ LAC RG 24, 21073 file 1242-3 v.1, "Extract from a Special Meeting of the Chiefs of Staff Held on 23 July 1957: RCN/RCAF Concept of Maritime Warfare"; (3 June 58) memo Cdn Section MCC to Joint Staff, "Coordinated Canada-United States Defence of North America Against Submarines"; DHH NBM 503rd meeting (5 Sep 56).

³⁹ LAC RG 24 vol 11182 file 8100-1 v.2, (23 Jul 59) The Naval Secretary to FOAC and FOPC, "Anti-Submarine Warfare Policy-U.S. Navy"; (1 Oct 58) CNO OPNAV Instruction 03360.2B, "Anti-Submarine Warfare Policy." This policy is essentially a prototype of a later US document, "The Strategic Concept for Antisubmarine Warfare," dated 15 Jan 60 located in the Admiral Arleigh Burke Papers, USN OA.

in 1954 was still valid and Canadian defence policy still adhered to this view.⁴⁰ The mission of Canadian maritime forces remained the same, as did the targeting estimates. Several force structure improvements were identified, however, to increase the compatibility between the Canadian and American concepts.

The reassessment retained the strong emphasis on forces in being. All maritime forces had to be able to transition immediately from surveillance of enemy submarines to attacking them: for the purposes of the concept, the only distinction between peace and wartime was the actual use of ASW weapons against a target. Close surveillance of submarine movements was an ongoing operation 365 days a year and had been since 1956 but greater emphasis was placed on such operations after 1959. Thus, Canadian maritime forces had to increase the tempo of their operations in “peacetime,” which in turn placed more wear and tear on maritime forces.⁴¹

Canadian planners identified a number of force structure improvement areas. First, CAESAR itself was far from a perfect surveillance system. Exercises using SOSUS in the Atlantic demonstrated that submarines were detected only one-third of a time. Most importantly, there was not a large enough sound data base to identify Soviet submarines on a continual basis; thus, offensive support forces were having problems localizing targets provided by CAESAR. Finally, CAESAR was having problems identifying nuclear-propelled submarines. As a result, Canadian planners pushed for extension of the CAESAR system farther eastwards and for improved data processing.⁴²

Until CAESAR's capabilities were improved, the RCAF believed that Argus and Neptune aircraft equipped with improved sensors and weapons could cover the area between the end of CAESAR coverage and the 1500 mile launch range. The same requirement existed for the RCN's Trackers regardless of whether they were operating from the *Bonaventure* or from shore bases. Surface vessel improvements were already being tested, specifically the Sea King-ASW destroyer combination which was in service by 1964. Improved hull mounted and variable depth sonars were also required. Finally, the RCN pushed hard for the acquisition of submarines, noting that both the Royal Navy and U.S. Navy had incorporated submarines into their operational ASW concepts.⁴³

⁴⁰ The MC48 strategic concept was superseded by MC 14/2 in 1956-57, which re-affirmed the two phase pattern of war.

⁴¹ LAC RG 24 acc 83-84/167 vol 89 file 1270-78-1 v.6, (19 Aug 59) “General Requirements for the RCN/RCAF Anti-Submarine Weapons System”; Ongoing surveillance of enemy submarine movements was now possible with the completion of the CAESAR system in 1958. Surveillance was somewhat spotty before then. See LAC RG 24 acc 83-84/167 vol 230 file 1400-64 v.1, (26 Aug 58) “ASDEVFORLANT Summary Evaluation report No. One: Current Operational Capabilities of the Atlantic SOSUS System.”

⁴² LAC RG 24 acc 83-84/167 vol 230 file 1400-64 v.1, (26 Aug 58) “ASDEVFORLANT Summary Evaluation Report No. One: Current Operational Capabilities of the Atlantic SOSUS System.”

⁴³ LAC RG 24 acc 83-84/167 vol 89 file 1270-78-1 v.6, (19 Aug 59) “General Requirements for the RCN/RCAF Anti-Submarine Weapons System”; DHH, Air Council Minutes [hereafter ACM] (23 Oct 59) “RCAF Concept of ASW Operations.”

Qualitative improvements in ASW weapons, sensors and command systems continued into the 1960's, as did the acquisition of three AOR ships for logistics operations. The AOR's were needed to increase the offensive support forces' endurance since they would be operating further away from their base in Halifax in response to the extended enemy missile range.

The RCN's and RCAF's recognition that a requirement for nuclear ASW weapons existed extended back to 1955. By 1961, a number of aerial ASW platforms and some of their crews had the capability to deliver nuclear depth bombs.⁴⁴ There were, however, political problems over the storage of U.S. nuclear weapons in Canada. The nature of these political problems is beyond the scope of this study; suffice it to say, the issues were sovereignty-oriented and related to command and control over the release of American weapons to Canadian forces. Canada herself did not possess her own indigenous nuclear weapons: she acquired delivery systems which were compatible with American nuclear warheads. As a result, arrangements were made in 1962 between the RCN, the RCAF and the USN to deliver, in an emergency, nuclear ASW weapons to Canadian airfields. Nuclear weapons allocated to Canadian maritime forces were stored at NAS Brunswick, Maine and at the U.S. Navy base at Argentia. A special hotline was installed between Argentia, Brunswick, Halifax and Norfolk so that SACLANT could release the warheads to the RCAF and the RCN. Transport aircraft would then move the warheads to Greenwood and Shearwater, Nova Scotia. Helicopters would then move some to HMCS *Bonaventure* or other ships, while Argus aircraft picked them up in Greenwood or in Brunswick.⁴⁵

By the time of the Cuban Missile Crisis in 1962, Canadian maritime forces had reached a high state of proficiency in ASW operations within the context of the missions postulated under the 1957 concept. This was achieved through continual training as well as through annual joint Canadian-American exercises. Two such exercise series included SACLANT's FISHPLAY series and the CUSRPG's SLAMEX series. FISHPLAY IV, held in 1959, was a barrier operations test in WESTLANT to see how effective existing barrier doctrine was in NATO navies assigned to SACLANT. Inaugurated in 1959, SLAMEX's exercised the close-in defence of North America against missile launching submarines. Later SLAMEX exercises incorporated defensive ASW nuclear operations into exercise "play."⁴⁶

In summary, this survey has demonstrated that Canadian maritime forces evolved from a SLOC protection force into a more specialized ASW force focused on a damage

⁴⁴ See Sean M. Maloney, *Learning to Love The Bomb: Canada's Cold War Nuclear Weapons 1951-1970* (Washington DC: Potomac Books, 2007) for the excruciating details.

⁴⁵ Sean M. Maloney and Joel J. Sokolsky, "Ready, Willing and Able: The RCN and Nuclear Weapons, 1954-1970", unpublished conference paper presented to the conference on Canada and the politics of the nuclear era, 25-27 September 1992.

⁴⁶ USN OA, "Annual Report Commander in Chief U.S. Atlantic Fleet 1 July 1958-30 June 1959"; "Report of the Commander In Chief U.S. Atlantic Fleet Upon Being Relieved, period 1 July 1959-29 February 1960"; LAC RG 24 vol 11 147 file 1400-1 vol 1, (4 Sep 59) MARCOMPAC to FOAC, "SLAMEX 1-60 scramble table."

limitation strategy. The new emphasis in 1954 on continental defence, which was in the main threat based, provided a starting point for this change. The shift from a projected to a real threat from enemy missile launching submarines prompted a corresponding shift not only in how Canadian maritime forces would be employed but also in how they were equipped. This evolution was continual and, by 1962, Canadian maritime forces were in a position to carry out the damage limitation task effectively.