The Submarine Service: Cross-Connect Open to the Allied System

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Tout au long de son existence centenaire, le service sous-marin canadien a nourri des liens, nombreux et divers, avec d'autres marines, celles du Royaume-Uni et des États-Unis figurant en particulier. Ces liens ont tendance à se diviser en trois grandes catégories: la formation, les échanges de personnel, et les échanges de plans opérationnels. La nature de ces relations ont changé au fil des années tant que la provenance des coques individuelles et des types d'équipement et d'armes communs a abouti à la croissance et la décroissance d'influence entre les partenaires alliés. Cependant, l'utilisation prudente des réseaux pré-établis créés à travers des échanges outre-mer a permis la transition vers une nouvelle classe de sous-marin en dépit des obstacles techniques et de personnel.

Cross-connect: *Aboard conventional submarines, a valve that allows water compensating systems to be connected together when a major component of one system such as a pump or valve chest is inoperable or defective. Cross-connection permits achievement of the correct trim and ballast conditions when the integrity of the primary system is not intact.*

When the Naval Service of Canada was created a century ago, the government of the day considered, then rejected, including submarines in its modest proposal for a Canadian fleet. However, the advent of the First World War resulted in the 1914 acquisition of Canada's first submarines and, for the first half the 100 years since, Canada operated this type of naval craft on an intermittent basis. It has been only for the past 50 years that the navy has maintained a permanent, home-grown submarine service with a distinctly Canadian character and way of "doin' the biz."[1] Moreover, during this latter

[1] Expression used within the Canadian submarine community to mean deploying and maintaining a submarine at sea. A further nuance implies actual operations rather than exercises or other force generation activities. See Michael Whitby, "'Doin' the Biz': Canadian Submarine Patrol Operations Against Soviet SSBNs, 1983-87," in Bernd Horn (ed.), *Fortune Favours the Brave: Tales of Courage and Tenacity in Canadian Military History*, (Toronto: Dundurn Press, 2009), 288. A related 'community' expression is reference to the submarine 'service' when in fact it is not an entity separate from the Royal Canadian Navy (which itself technically no longer is a 'service' but rather a 'Command' within the unified Canadian Armed Forces); however, for the purposes of this essay, and to reflect the background of the author, use of the term is retained.

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period, Canada has relied on strong ties with Commonwealth and allied submarine services to assist in training personnel as well as shaping submarine operational practices and doctrine. The aim of this paper is to discuss the linkages that Canada has developed within the underwater brotherhood of like-minded submarine services, and how these connections have benefited our navy.

The type of relationship that exists between the Canadian and allied submarine services is found neither in the broader Canadian navy nor, with the possible exception of our Special Forces, in the rest of the Canadian Forces. The relationships have been forged primarily due to the provenance of the submarines that Canada has acquired, as well as out of necessity for training that did not exist in Canada and, in many cases, personnel shortages that afflicted all submarine services at one time or another. To better understand the place of Commonwealth navies in the evolution of our employment of submarines, a short review our submarine service's roots is in order.

A Brief History of Canadian Submarines

The Royal Canadian Navy was only four years old when the First World War threatened Canada. Concerned that the limited coastal defences would be insufficient to effectively defend the province's sparsely populated coastline and unable to secure assistance from Ottawa, the government of British Columbia purchased two US-built submarines from a Seattle shipyard. Two days later on 7 August 1914, a red-faced federal government confirmed the acquisition of the two vessels, *CC-1* and *CC-2*. These craft patrolled Canada's west coast for three years, and have been credited, rightly or wrongly, with deterring any German incursions into those waters.[2]

In addition to the men at sea in *CC-1* and *CC-2* during the war, a few Canadian naval officers also served aboard Royal Navy submarines. Four of these men rose to command British boats: Lieutenants J.G. Edwards, B.L. Johnson, W.M. Maitland-Dougall, and R.C. Watson. In May 1915, Lieutenant Johnson earned the distinction of being the first ever Canadian appointed to command a submarine, and was awarded the Distinguished Service Order in 1917 for gallantry while in command of submarine *H8*.[3]

CC-1 and *CC-2* were transferred to the Atlantic in 1917. Enroute, they earned the distinction of being the first Canadian warships – or for that matter any flying the white ensign – to pass through the Panama Canal. They subsequently were used for training in the Bras D'Or Lakes and in 1920 were sold for scrap.

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2 While in provincial hands, these boats were known informally as "McBride" and "Paterson", named after the Premier, Sir Richard McBride, and the president of the Seattle Construction and Drydock Company, Mr. J.V. Paterson. See Starr J. Stinton, *CC1 and CC2 – British Columbia's Submarine Fleet*, on-line at: http://www.navalandmilitarymuseum.org/resource_pages/coastal_defence/subs.html (accessed 26 May 2010).

3 J.D. Perkins, "The Submarines of Canada's Navy," in *Wings Magazine, CASAP*, 1988, 14; Julie Ferguson, *Through a Canadian Periscope* (Toronto: Dundurn Press, 1995), 337-338. The term 'boats' is another used colloquially within the community, whereas properly submarines are considered warships, and within the RCN are commissioned as 'His/Her Majesty's Canadian Ships'.

The RCN's next submarines were given to Canada by the British in 1919. They had been included in an order for ten submarines built in the United States for the Royal Navy. Two of these boats, *H-14* and *H-15* had been on their way to England when the First World War ended. After transfer to the RCN, they were renamed *CH-14* and *CH-15* and underwent major refits. By 1921 they were ready for re-commissioning but unfortunately their commissions were short-lived. Both were paid off in 1922 during the post-war period of retrenchment. Thereafter, the RCN did not 'own' any submarines again for 23 years.

When the Second World War broke out, Canada had no submarines in its inventory, and executed no plans for submarine construction. However, during the hostilities, twenty-three of the RCNVR officers sent overseas served aboard British boats. Among this group, two officers found themselves in command of Royal Navy submarines: Lieutenant-Commander F.H. Sherwood and Lieutenant J.A. Cross. Sherwood was awarded the Distinguished Service Cross in 1943 for "bravery during successful submarine patrols" as First Lieutenant of HMS *Safari*. He also earned a Bar to his DSC in 1945 for "gallant services in Far East patrols" while in command of HMS *Spiteful*. Another Canadian naval reservist, Sub-Lieutenant E.K. Forbes, was awarded a DSC for "distinguished services in successful patrols in HM Submarines" while aboard HMS *P34*.[4]

At the end of hostilities in 1945, two German submarines, *U-889* and *U-190*, surrendered to Canadian warships in the western Atlantic. These boats were crewed by Commonwealth personnel, and were exploited for publicity purposes. In 1946, *U-889* was turned over to the United States Navy, and later destroyed. The following year, *U-190* was sunk by Canadian ships and aircraft.[5]

By the early-1950s, the RCN appreciated the need for undersea craft as targets for anti-submarine force training. Having owned no submarines since 1947, the services of training boats had to be obtained from allies, the British in the Atlantic, and the Americans in the Pacific. From time to time a submarine was dispatched from the Royal Navy's North America and West Indies Station for a few months of temporary duty with the RCN. However, when this station was phased-out in the early-1950s, a new source of training submarine had to be determined. As well, the USN was finding it increasingly difficult to provide submarines for the west coast.

An agreement was reached with Britain for the basing of a squadron of 'A'-class submarines in Canada by 1955. Three RN submarines were stationed in Halifax for a period of four years, with a provision for extensions, if necessary. Canada furnished the facilities for the boats, designated the Sixth Submarine Squadron, and also contributed funds towards their operating costs.

By the late-1950s it was recognized that a better way to provide submarine services

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4 Perkins, "The Submarines of Canada's Navy," 14; and Ferguson, *Through a Canadian Periscope*, 337-338. For a rare Canadian memoir of service in submarines, see Frederick H. Sherwood, *It's Not the Ships… My War Years* (Abbotsford, BC: Lifewriters, 2014).

5 *U-190*'s last victim of the war had been HMCS *Esquimalt*, a Canadian minesweeper. *Esquimalt* had also been the last ship lost by the RCN before the German surrender. In symbolic retaliation, U-190 was towed to the site of the earlier *Esquimalt* action, and ceremoniously sunk by Canadian ships and aircraft on Trafalgar Day, 1947.

was needed. In 1959, the Chief of Naval Staff recommended that the RCN create its own submarine force, first to augment then eventually replace the Sixth Submarine Squadron, and that the craft to form this force should be nuclear-powered submarines of a proven US or UK design. By 1960, it had been decided that the nuclear proposal was too expensive, and that diesel-electric submarines should be pursued instead. In October of that year, the Minister of National Defence was briefed on two options of roughly similar cost: six American Barbel-class submarines or six British Oberon-class submarines.[6]

In the meantime, the British squadron in Halifax was satisfying the RCN's requirements in the Atlantic, but did nothing to address the needs of the west coast. In 1959, an exploratory inquiry was made into the acquisition of an American submarine for loan to Canada. The USS *Burrfish*, a Second World War Balao-class boat, was selected from those available as the submarine most suited to RCN requirements. An agreement was reached with the USN for the five -ear lease of *Burrfish*, with provision for renewal. The submarine was commissioned as HMCS *Grilse* in 1961.

In 1962, the navy's acquisition program recommended that Canada purchase three rather than six Oberon-class boats. Yet another study investigated the feasibility of nuclear-propelled submarines for the RCN, six Thresher-class attack submarines to be built in Canada. The Threshers, in addition to the three Oberons, would have resulted in a Canadian submarine service of approximately one thousand naval personnel plus support staff. However, fiscal constraint and lack of Cabinet support negated the nuclear option, and the decision was taken to proceed solely with the three Oberons.[7]

Between the years 1965 and 1968, Canada took delivery of HMC Submarines *Ojibwa, Onondaga* and *Okanagan* (known collectively as the 'O-boats'), and stood up the First Canadian Submarine Squadron (CANSUBRON ONE). HMCS *Grilse* operated on the West Coast until 1968, when she was replaced by an American-built Tench-class boat, commissioned as HMCS *Rainbow*. This boat continued her service until 1974, when she too was paid off. With the departure of *Rainbow*, no Canadian submarine would be based permanently on the west coast for nearly 30 years, until the coastal transfer of HMCS *Victoria* in 2003.

Canada operated the three Oberons until they were phased-out in the late-1990s, with HMCS *Onondaga* being the last to be paid off in 2000. They were replaced by four British Upholder-class diesel-electric submarines, renamed the Victoria class once in Canadian hands. The first of these, HMCS *Victoria,* arrived in Canadian waters in October 2000.

Connections with Commonwealth Submarine Forces

The foregoing overview identified the various classes of submarine that Canada has owned and operated during the past century. In *The Canadian Submarine Service in Review*,

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6 Rear-Admiral S. Mathwin Davis, "It Has All Happened Before: The RCN, Nuclear Propulsion and Submarines," in *Canadian Defence Quarterly* (Autumn, 1987), 34-41; David Perkins, *The Canadian Submarine Service in Review* (St. Catherines: Vanwell, 2000), 140-143.

7 Perkins, "The Submarines of Canada's Navy," 14

David Perkins traces the genesis of submarine acquisition in this country in greater detail and observes that:

> The Canadian submarine community has always had a strong connection with the Royal Navy in operating submarines, and to both Britain and the United States in its types of submarines. Nevertheless, the spiritual roots of Canadian submariners undeniably lie in England. Although these roots sometimes become obscured by nationalistic sentiment, any honest description of Canadian submarines must be told from that perspective.[8]

While the sporadic linkages to Britain and the United States are easy to identify from 1914 to 1947, these were but brief forays into the submarine business, and the result was neither a build-up nor a continuum of submarine expertise within the RCN. Some argue that the 1961 lease of *Grilse* constitutes the birth of the Canadian submarine service. However, both *Grilse* and her US-built successor were of differing classes and were operated only slightly longer than the CC and H-boats before being scrapped. Thus, it was not until the Oberon class arrived in the mid-1960s that Canada generated what could be termed a genuine submarine service in the modern context.

The Canadian submarine service has nurtured many diverse international ties with other navies over the years, the relationships tending to fall into three broad categories: training, personnel exchanges, and exchanges of operations schedules. Training and personnel exchanges are the most closely linked, although all three are connected to some degree with each other. As well, the nature of the submarine service's relationships with the Commonwealth and allies has evolved over time, and can be addressed in four periods of roughly a dozen years apiece. It is through these three lenses and four timeframes that the relationships will be examined.

The decade from the mid-1950s to mid-1960s was the precursor to a 45 year period of relative stability in employment of Canadian submarines. This was a time of hardening of Cold War positions between the West and the Soviet Union, escalating tension that saw the Cuban Missile Crisis, and a proliferation in submarine construction by both sides. From the Canadian submariner's perspective, three major initiatives were undertaken during this timeframe: supplementing of RN submariners in the UK by Canadian sailors; the stand-up of the Sixth Submarine Squadron in Halifax; and the acquisition of a submarine from the Americans for training on the west coast.

In the fall of 1954, the Canadian Cabinet approved the legal instrument for the establishment of the squadron of British submarines to operate in Canadian waters. This document identified the total personnel requirement for the squadron to be 304 persons, including spare crew and shore staff. It also specified that Canada provide 180 sailors as part of the arrangement, but not more than 152 of these men were to serve in Canada, the remainder to serve with the RN overseas. The written agreement also stipulated that the Canadian crew members of any British submarine based in Halifax had to number 50 percent or fewer.[9]

In keeping with the terms of the accord, Canada despatched the first of three groups

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8 Perkins, *The Canadian Submarine Service in Review*, vii.

9 *Ibid.*, 123.

that comprised the 'First Block Draft' to the United Kingdom in November 1954. This group numbered 48 submarine trainees. A second group of 80 and a third group of 42 flew overseas within days of each other in January 1955. This initial cadre of 170 Canadian sailors, as well as smaller groups that followed in later years, received their submarine training from and subsequently were posted throughout the British submarine service in the UK and abroad at RN bases in Singapore, Malta, Australia, and some to Halifax. One veteran of the First Block Draft reflects that the number of Canadians aboard the British boats in Halifax averaged about four to six (roughly ten percent).[10]

Integration of Canadians into the RN submarine service occurred with some teething pains, but by and large was considered successful. The experience gained throughout the reaches of the British empire by this cadre of Canadian submariners was significant, and they formed the lion's share of the crews of the ex-American boats in Esquimalt, and ultimately the backbone of the submarine squadron that the RCN stood-up in Halifax a few years later. Indeed some suggest that it was the 1954 despatch of Canadians to the RN that marks the germination of the Canadian submarine service. In any event, the Canadians' contribution to the Royal Navy was not without sacrifice. In the most extreme case, Petty Officer 2nd Class Laverne MacLeod, serving aboard HMS *Sidon*, was one of thirteen men lost in the accidental sinking of that boat in 1955.

From the mid-1950s to the mid-1960s, in addition to the sailors, a number of Canadian officers served aboard RN submarines. Three of them were appointed in command of British boats: Lieutenant-Commander S.G Tomlinson in HM Submarines *Trespasser, Trenchant*, and *Rorqual*, and Lieutenant-Commander G.R. Meek in HMS *Artful*. Another Canadian, Lieutenant E.C. Gigg, had commanded HMS *Selene* in 1953 prior to the First Block Draft, and then HMS *Tally Ho*. He was appointed in 1960 as Commanding Officer to reactivate HMCS *Grilse* in the United States.[11]

1960s Experience with Ex-USN Submarines

The commissioning crew of HMCS *Grilse* was not as homogeneous as one might imagine. Both the captain and executive officer had gained submarine experience as RN officers; the rest of *Grilse*'s wardroom of five had completed the American Submarine Officer Training Course (SOTC) and had served aboard USN submarines as a result of the earlier bid by Canada to acquire nuclear submarines. Although the majority of the sailors had sailed in RN boats, the entire crew was sent to New London for the USN basic submarine course. As for the captain, notwithstanding that he was already submarine command-experienced, he along with his executive officer underwent the USN Submarine Commanding Officers' Course, also known as the PCO Course in American parlance.[12] The

10 *Ibid.*, 125, 133; CPO1 (ret'd) D.H. "Buster" Brown, interview by author, 12 March 2010, Halifax, NS.

11 Cdr (ret'd) E.C. Gigg, interview by author, 20 March 2010, Ottawa, ON.

12 The acronym PCO stands for Prospective Commanding Officer. The XO, Lt J. Rodocanachi RCN, later commanded *Grilse* and *Ojibwa*, and was the only post-Second World War Canadian officer to command a Canadian submarine without having passed the RN Perisher, or a submarine command course based on the British model.

few sailors who joined *Grilse* after her commissioning in 1961 followed an onboard qualification scheme designed by the captain that was unique to that single platform.[13]

It is worth noting that from 1961 to 1974, Canadian submariners served aboard British-built submarines either in the UK or on Canada's east coast, or aboard former American boats based in Esquimalt. It was midway through that 14 year period that the First Canadian Submarine Squadron came into being, based in Halifax. The duality of two different sets of equipment and operating procedures led to a certain 'split personality' in the fledgling submarine community. The individual submarine qualification was strongly influenced by the USN methodology. As a result, the US lexicon used aboard *Grilse* and *Rainbow* migrated into use aboard the east coast Oberon-class submarines. For a couple of confusing years, operating procedures onboard were in flux; orders were given to 'snorkel' or to 'blow negative', when the crew had been trained in RN procedures to 'snort' and to 'blow Q'. Lack of clarity in the passing and receipt of orders can be deadly in a submarine and, in the end, the British lexicon and procedures dominated, and the Americanisms were dropped from use.[14]

Mid-1960s to Late-1970s

During the mid-1960s to the late-1970s, Cold War submarine operations continued. Soviet SSBNs stationed themselves hundreds of miles off the North American coast in huge, static patrol areas from which their long-range missiles could strike targets along the eastern seaboard. It was during this period that Canada acquired the Oberons that would become the longest running class of submarines in our nation's history**.**

With the stand-up of the First Canadian Submarine Squadron on 22 April 1966, the RCN faced a new challenge: the sustained generation of three submarine crews and supporting staff that, in total, numbered over 300 personnel. While Canada had built up a cadre of over two hundred submariners through its supplementation of RN units, running one's own submarine service would prove to be an entirely different business. The crewing of submarines was then and continues to this day to be an especially vexing problem for the naval leadership.

It is interesting to note the experiential composition of the original crews of the Canadian Oberons. At the 1965 commissioning of *Ojibwa*, the entire crew had been trained by and served with the RN. At *Onondaga*'s ceremony, the majority of her personnel also had been RN trained; only about a half-dozen had not served with the British. By the time *Okanagan* commissioned in 1968, the RCN had built a larger cadre with Canadian submarine experience, and only about a quarter of *Okanagan*'s commissioning crew had served with the RN.[15]

Canadian non-commissioned sailors who volunteered for submarine duty attended the RN's basic submarine training course until 1966, at which time a Canadian package was

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13 Gigg, interview by author, *op. cit.*; Ferguson, *Through a Canadian Periscope*, 255-257; Perkins, *The Canadian Submarine Service in Review*, 142.

14 Perkins, *The Canadian Submarine Service in Review*, 149.

15 CPO1 (ret'd) D.H. Brown, interview by author, 12 March 2010, Halifax, NS.

created and run out of Halifax for the first 12 Canadian students. By contrast, junior officers who volunteered for submarines continued to be sent to HMS *Dolphin* for the submarine Officers Training Course (OTC). On average, three to four junior officers per year undertook basic training in the United Kingdom from the mid-1960s to the mid-1980s.

Since 1930, the Royal Navy operated its own submarine escape training tank (SETT) at HMS *Dolphin*. Canada was one of at least 18 nations to use that unique facility. During the 1960s and 1970s, all Canadian submariners trained there, except for those destined for the former US submarines, and there was a requirement to attend refresher submarine escape courses every two years. Canada was normally offered two or three training serials of up to 24 persons each per year, as well as periodic opportunities for senior non-commissioned members to undertake the Escape Coxswains Course.

Canadian submariners profited from other training in the UK. As a result of one of many submarine 'get well' initiatives, non-commissioned members were sent on Patrol Sonar Maintenance, ASR1 Rebuild, and One Man Control courses.[16] There were normally two or three places per year offered to Canada. Junior officers partook of the RN Patrol Submarine Sonar Officer, and Junior Officer Warfare Courses and, as they became more experienced, the Attack Coordinators Course to prepare them for duties as executive officer. On average, two Canadian officers attended the latter, and one or two junior officers per year might attend the sonar and operations courses.

Perisher – The Submarine Command Course

Perhaps the most influential and important course the Royal Navy offered the Commonwealth and allied submarine community was the Submarine Command Course (SMCC), known informally around the world as 'Perisher'. (The moniker is derived from the institution that originally offered the course in 1917, the Periscope School at *HMS Thames*; however, in the years since, the nickname has taken on its morbidly humorous 'pass or perish' connotation.)

Perisher was a four month course offered by the RN only twice a year to a dozen students per course, although a portion of the 24 positions were made available to international officers. In the 1970s and 1980s, when the RN had a substantial fleet of diesel submarines, Perisher students hailed from Australia, Canada, the Netherlands, and occasionally from Norway, West Germany, Portugal, Brazil, Israel and Chile. However, international interest dropped off when the RN submarine force went all-nuclear in the early-1990s. From the mid-1960s to the late-1970s, Canada sent one or two officers to the RN Perisher per year; Australian and Dutch participation was similar. While many Canadian candidates were unsuccessful, the number that passed was sufficient to supply three submarines with captains, and to feed the two post-command shore positions during this period.

RN Sea Training and Work-Up

Over time, the new Oberons went into and came out of their scheduled refits in

16 The Admiralty Standard Range 1 (ASR1) was the O-boat diesel engine. The One Man Control was the electrical/hydraulic system that controlled the hydroplanes and rudder.

Canada. Once a refit ended, the major part of the transition back to operational status was the 'work-up' or WUP. Canada had not yet established its own submarine sea training organization, and relied exclusively on the RN Sea Training Staff to conduct this vital training regimen and inspection.

A short visit to Canada and sea readiness inspection at sea by the RN Sea Training Staff cleared the way for a submarine to make the transatlantic voyage to the UK where the main work-ups would occur. Once in the UK, the submarine underwent a Safety WUP that evaluated the ship's company's ability to respond to multiple failures of onboard systems. The Safety Work-Up was followed by the Operational Work-Up during which the submarine carried out a variety of combat tasks, all the while dealing with complex systems failures and defects injected into the program by the sea trainers. Cumulatively, the two work-ups took about a month to complete. Records show that Canadian submarines underwent WUPs in the United Kingdom a total of 14 times from the mid-1960s to the mid-1980s.[17]

Personnel Exchanges

The Canadians who had supplemented the RN during the early years returned to Canada to crew the *Oberons*. With Canada now running a submarine squadron independent from the British, it was assessed that there was significant value in keeping a solid connection with the 'parent' submarine service. It was decided to establish permanent sea-going exchange positions for junior officers in each other's submarine organizations, two positions for seaman officers, and two positions for engineers. Canadian officers served aboard Royal Navy 'P'- and 'O'-boats in varying capacities, but usually as navigating, operations, or sonar officer, or in the case of technical officers, the marine engineering officer (MEO) or weapons engineer officer (WEO) of the submarine. Some junior officers also assumed duties of executive officer.

Although Canadian officers served on exchange in Faslane, Scotland and Devonport, England, by the late-1970s Canadian policy was to concentrate whenever possible the exchange positions in the Portsmouth area, that is, aboard submarines based out of *HMS Dolphin*. These positions were not linked to a particular submarine, but rather the RN appointer had free rein in assigning the Canadians to whichever boats he deemed most appropriate. Exchange officers did not serve aboard the 'special fit' boats HM Submarines *Onslaught* and *Oberon*. Places aboard these two submarines were reserved for British nationals.[18]

Linkage to United States Navy

In terms of Canada's links with its southern ally during this period, beyond the USN training for the reactivation of *Grilse* and *Rainbow*, submariners who served aboard those two boats also undertook escape training with the USN. Records show, for example, that between

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17 Based on a list of Canadian Submarine Operations 1969-1998 compiled by Cdr Michael Craven and Michael Whitby, 20 October 2009, and cross-referenced against Annual Historical Reports of HMC Submarines *Ojibwa, Onondaga,* and *Okanagan*, 1965 to 2000 (copy held by author).

18 Capt(N) N.H. Jolin, personal email to author, 6 April 2010.

1970 and 1972, *Rainbow* personnel utilized 176 places during various serials of submarine escape and refresher training in Pearl Harbor and San Diego. During that same period, sonar tape training and sonar supervisor courses in Pearl Harbor were attended by 18 sailors, and another seven took the US sonar maintenance courses in San Diego. Reports also provide the first indication of a Canadian submarine attack team using the facilities of an American attack simulator in 1972 at Pearl Harbor.[19]

In 1976, Commander J.E.D. Bell, as Commander First Canadian Submarine Squadron (CANCOMSUBRON ONE), proposed an exchange of staff officers with Commander U.S. Submarine Fleet Atlantic (COMSUBLANT) in Norfolk, Virginia. From a bilateral perspective, such an exchange would provide direct access to the submarine force commander of our adjacent superpower, and this proximity would facilitate smoother interoperability with the USN in terms of waterspace management and other sensitive operational issues. From a broader perspective, COMSUBLANT also held a key NATO leadership role. He was designated Commander Submarine Allied Command Atlantic, the officer who would control, in the event of hostilities, all NATO attack submarines in the Atlantic. A Canadian officer on his staff would have a more disproportionate influence over NATO submarine affairs than were he serving on another staff.[20]

The negotiations proved successful, and an exchange position at the commander rank was established between Canada and the United States, in Norfolk as COMSUBLANT's NATO Plans, Policy and Exercises Officer. Commander R.C. Perks became the first officer to take up this post in 1976. The USN offset was a position in the Canadian Forces Maritime Warfare Centre where the American exchange officer's nuclear submarine experience could be drawn upon for tactical development. Since the creation of this exchange, twelve Canadian officers have served in Norfolk on this important staff.

The paying off of *Grilse* and *Rainbow* without replacement resulted in the emergence of an Atlantic-centric approach to submarine operations in Canada that lasted until the arrival in Esquimalt of HMCS *Victoria*.

Early-1980s to Mid-1990s

By the late-1970s, the Canadian naval leadership had decided to boost the level of operational capability of the O-boats, and introduced a watershed development in the form of the Submarine Operational Update Program (SOUP). This *de facto* mid-life modernization contained vast improvements to the submarine's combat capability. SOUP significantly boosted the Canadian Oberons' ability to detect and track multiple contacts through sophisticated passive ranging sonar and a new computerized submarine fire control system (SFCS). These upgrades were complemented by the acquisition of the US Mk48 Mod 4 heavy-weight torpedo a couple of years later. It was said that the SOUP upgrade transformed

19 Canada, Department of National Defence, Directorate of History and Heritage (DHH), SRW:1630-1 *HMCS Rainbow Annual Historical Report 1970*, 14 April 1971; SRW:1630-1 *HMCS Rainbow Annual Historical Report 1971*, 28 March 1972; SRW:1630-1 *HMCS Rainbow Annual Historical Report 1972*, 18 January 1973.

20 DHH, 1SM:1630-1 *First Canadian Submarine Squadron Annual Historical Report 1976*, 28 November 1977.

the Canadian O-boat from a "semi-passive ASW training vessel, to a fully capable offensive undersea weapons platform."[21] HMCS *Ojibwa* was the first boat to be 'soup'd up' on entering refit in 1980.

The year 1983 saw the end of a 32-year connection when the RN submarine Officers Training Course (OTC) was patriated to Canada, and the first Canadian Basic Submarine Officer course was run for four officer trainees at the Fleet School in Halifax. Since the first post-war officer trainee attended OTC in 1950, over 125 Canadian officers had received their basic submarine training in the UK.[22]

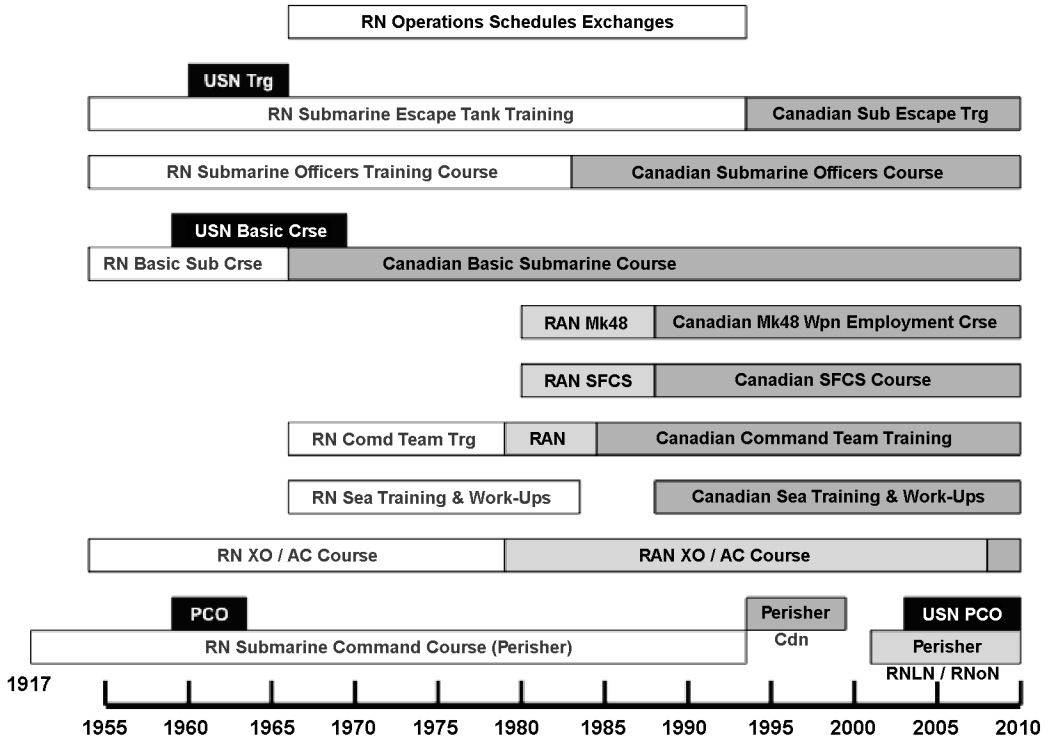

Figure 1: Timeline of Submarine Training Migration to Canada

Other courses taught by the RN were targeted for patriation to Canada. It was decided that a Canadian solution to escape training should be found, and an arrangement was made to buy a recently paid off British Oberon to be used as Harbour Training Submarine. On arrival in Canada in September 1989, the propellers of HMS *Olympus* were removed, and she was turned over to the Fleet School as a harbour training submarine. Submarine trainees reported onboard to trace piping and conduits, and to operate various systems, including the running of diesel engines and charging batteries. Later, the after escape tower was modified to permit cycling individuals through the compartment in a form of unpressurized wet escape

21 Thomas Lynch, "Modernizing the Subs: SOUP," in *Canada's Navy* (Calgary: Corvus, 1985), 168-170; quoted in Whitby, "Doin' the Biz," 295.

22 Perkins, *The Canadian Submarine Service in Review*, 119.

training, thus ending dependence on the RN for this expensive training. The Canadian Forces Fleet School ran its first escape refresher training serial in 1993.[23]

The Canada-UK exchange program for officers established in the 1960s continued to be staffed and billets filled. Canadian junior officers serving aboard British boats did so through the full range of British operations. Of particular value were the operational surveillance and intelligence gathering patrols, affectionately referred to as 'sneakies'. During these patrols, British submarines played a game of cat and mouse with Soviet submarines and other maritime platforms. Some operations were sufficiently sensitive that the Canadian exchange officers had to be landed ashore and replaced by RN officers before the boat could go on patrol.[24] This occurred in 1982, for example, when Lieutenants D.W. McDonald and L. Dyck were landed respectively from HM Submarines *Onyx* and *Osiris* when these boats left at the outbreak of the Falklands War. After hostilities ended, there was considerably less sensitivity, and Canadian exchange officers such as Lieutenant B. Carter conducted a full Falklands patrol aboard HMS *Osiris*. For the duration of this program, no fewer than 70 Canadians have served on exchange or been loaned in submarine positions to the RN. More than 35 RN officers have served aboard Canadian boats or in submarine support jobs during the same period.

Unlike the case of the officer exchange positions, there had not been any Canadian non-commissioned submariners assigned in the UK since the repatriation of the personnel for the stand-up of CANSUBRON ONE. Over time it was appreciated that valuable experience could be derived through an exchange of first class petty officers of the sonar operator and underwater control trades. By virtue of the normal Canadian operating areas and the limitations of conventional propulsion, Canadian submariners rarely had the opportunity to monitor Soviet submarines first hand; that was not the case for British who had Soviet SSNs (nuclear-powered attack submarines) lurking in their maritime approaches. Thus, in 1980, Petty Officer 1st Class F. Ralph was sent to the UK for employment in the Sonar Tape Trainer at HMS *Dolphin*. His RN counterpart was posted to the Continuation Tape Training facility at CANSUBRON ONE. It was soon recognized that the non-commissioned exchanges should be expanded to include the electrician and engine room artificer trades. Positions at the first class petty officer level were created at *Dolphin*, and the Canadians sailors on exchange contributed to the provision of technical shore support to RN submarines. Their RN counterparts found themselves at the Fleet Engineering Maintenance Unit (FEMU) in Halifax.

Canada was not alone in vying for valuable personnel exchange appointments with the Royal Navy. Australia also sought out similar opportunities and negotiated an exchange position for command of a British conventional submarine. During the 1970s and 1980s, it was not uncommon for two Commonwealth officers from the same or different navies to be serving aboard the same RN boat. This was certainly the case in 1986 when the author was embarked aboard HMS *Walrus* for the first sea phase of his Perisher. At the time, *Walrus* was commanded by Lieutenant-Commander G. Anderson

23 DHH, 1SM:1326-1(COHQ) *First Canadian Submarine Squadron Headquarters Annual Historical Report 1993*, 21 April 1994.

24 Cdr B. Houle, personal email to author, 26 April 2010.

RAN, who was ably supported by Canadian Lieutenant R.A. Davidson as sonar officer.

Exchanges of Operations Schedules

Deployments to Eastern Atlantic under Royal Navy operational Control

Year	Submarine	Major Training	Operations and Special Training
1965	HMCS Ojibwa	RN Work-Up	Commissioning, Ops Schedule Exchange
1967	HMCS Onondaga	RN Work-Up	Commissioning, Ops Schedule Exchange
1968	HMCS Okanagan	RN Work-Up	Commissioning, Ops Schedule Exchange, SBS Trg
1970	HMCS Ojibwa	RN Work-Up	Ops Schedule Exchange
1972	HMCS Onondaga	RN Work-Up	Ops Schedule Exchange
1973	HMCS Okanagan	RN Work-Up	Ops Schedule Exchange
1974	HMCS Onondaga		Ops Schedule Exchange, SBS Trg
1974	HMCS Okanagan		Ops Schedule Exchange, SBS Trg
1975	HMCS Okanagan		Ops Schedule Exchange, SBS Trg
1975	HMCS Ojibwa	RN Work-Up	Ops Schedule Exchange
1976	HMCS Ojibwa		Ops Schedule Exchange, SBS Trg, RN Perisher
1977	HMCS Onondaga		Ops Schedule Exchange, SBS Trg, RN Perisher
1978	HMCS Ojibwa	RN Work-Up	Ops Schedule Exchange, SBS Trg, RN Perisher
1979	HMCS Okanagan	RN Work-Up	Ops Schedule Exchange
1980	HMCS Onondaga	RN Work-Up	Ops Schedule Exchange
1980	HMCS Okanagan		Ops Schedule Exchange
1981	HMCS Onondaga		Ops Schedule Exchange, SBS Trg, RN Perisher
1982	HMCS Okanagan		Ops Schedule Exchange
1982	HMCS Ojibwa	RN Work-Up	Ops Schedule Exchange, SBS Trg
1984	HMCS Ojibwa		Ops Schedule Exchange
1984	HMCS Onondaga	RN Work-Up	Ops Schedule Exchange, SBS Trg, RN Perisher
1985	HMCS Ojibwa	RN Work-Up	Ops Schedule Exchange
1986	HMCS Onondaga		Ops Schedule Exchange
1986	HMCS Okanagan	RN Work-Up	Ops Schedule Exchange
1987	HMCS Okanagan		Ops Schedule Exchange
1990	HMCS Ojibwa		Ops Schedule Exchange, SBS Trg, RN Perisher
1992	HMCS Ojibwa		Ops Schedule Exchange
1995	HMCS Okanagan		Ops Schedule Exchange
1996	HMCS Okanagan		Ops Schedule Exchange, SBS Trg

SBS denotes Special Boats Section of Royal Marine Commando.
RN Perisher denotes Canadian submarine hosting Perisher course for tactical sea phase.

Figure 2: Deployments to Eastern Atlantic under Royal Navy operational Control. Source: Commander Michael Craven and Michael Whitby, cross-referenced against the Annual Historical Reports of HMC Submarines Ojibwa, Onondaga, and Okanagan, 1965 to 2000.

While personnel exchanges and various training courses were of value, another initiative was of equal or greater importance. This was the periodic exchange of submarine operations schedules between Canada and the UK. Under this initiative, a

Canadian submarine would deploy to the eastern Atlantic, and would transfer to British operational control in order to fulfill tasks of the Royal Navy operations schedule. To reciprocate, a British boat would arrive in Canada to undertake the MARCOM operations program. These exchanges normally lasted two to three months.

The value for Canada under this arrangement was multi-faceted. First, a Canadian crew would gain submerged experience in areas of high marine traffic density. For example, in the English Channel it was common for submarines to detect and track from 50 to 100 vessels in a single hour. By contrast, in the operations areas off the coast of Nova Scotia, it might be possible to go for an entire day and not encounter that number of vessels.

Operations exchanges also proved to be beneficial since, while under British operational control, Canadian submarines employed conventional submarine doctrine pioneered by the Royal Navy.[25] Tactical publications, developed by the RN for conventional submarines were issued to Canadian boats on exchange. This facilitated working through the doctrine and procedures on NATO and joint exercises, before adapting and migrating the doctrine into 'Canadianized' versions, as Canada's dependence on the RN diminished with increased experience with the Canadian Oberons.

Perhaps the most important benefit derived from the operations exchanges was the opportunity for Canadian submarines to participate in real operational patrols, the targets of which were the Soviet naval forces plying the so-called Greenland-Iceland-United Kingdom (GIUK) Gap and the UK's maritime approaches. These 'sneakies' allowed Canadian crews to function in as close to wartime conditions as was possible during the Cold War, and resulted in the accumulation of invaluable experience and lessons learned. This led to a sufficient level of confidence being built that the Canadian submarine service began to undertake similar patrols, known as Operational Surveillance Patrols (OSP), in the CANLANT area of responsibility.

During the years 1970 to 1993, Canada carried out 25 operations exchanges with the United Kingdom, conducting a spectrum of operations, from escape tower functioning trials, to co-ordinated transits or 'wolf pack' operations, to surveillance of Soviet AGIs (intelligence-gathering auxiliaries) monitoring the approaches to the UK SSBN (ballistic missile-firing nuclear-powered submarine) bases, to intelligence gathering of new construction Soviet warships transiting from the Baltic Fleet to the Black Sea Fleet and vice versa.[26]

The Australian Connection

In addition to the sea change in operational capability that the SOUP program introduced, SOUP had an equally noteworthy impact on the Canadian submarine

25 The USN also was a source of submarine doctrine; however, by the late-1950s had made the decision to phase out conventional submarines from its order of battle, and by the 1970s had ceased doctrinal development for diesel-electric submarines. Commissioned in 1959, the USS *Blueback* was the last diesel-electric attack submarine built for the USN.

26 Craven and Whitby, "List of Canadian Submarine Operations 1969-1998," *op. cit*.

service's relationship with the RN and RAN. Since the Australian boats had been fitted with SOUP's key equipment prior to Canada's modernization, SOUP's substantial hardware upgrade, coupled with the Mk48 torpedo acquisition, meant that Canadian submarines, from a combat capability perspective, now had more in common with those of its Commonwealth ally Australia than with those of its traditional mentor the Royal Navy. As a result, the early-1980s saw a steady de-emphasis of ties with the UK and the development of a closer relationship with the RAN in terms of training and new personnel exchange programs. As well, during the early-1980s, Australia and Canada began preliminary investigation into a mutual venture for replacement of both nations' Oberons. Unfortunately, this project failed to gain traction, and each navy went its separate way in the development of replacement or life extension programs.

As Canadian Oberons completed their SOUP refits, their command teams travelled to Australia to undergo command team training at the RAN Submarine Warfare Systems Centre.[27] There they practised attack drills and weapons employment skills for roughly two weeks in preparation for the work-up. With the advent of SOUP, Canadian submarines ceased their decades-long involvement with the British for the purpose of command team training. However, in only a few years, software development for the Australian submarine fire control system (SFCS) outpaced the Canadian version, and it made little sense for Canadian submariners to continue this training in Australia. By then, SFCS courses were being run in Canada, and an 'experimental' attack trainer had been installed in Halifax.

In 1978, Canada despatched naval Lieutenants N.P. Nicolson and A.B. Dunlop to evaluate the Australian submarine executive officer (SMXO) course and, by the early-1980s, the RAN became the exclusive trainer of budding Canadian submarine XOs. In another vein, as part of the expanding relationship with the RAN, Canada offered them places on the sailors' basic submarine course. Between 1982 and 1986, Halifax was home to roughly 30 RAN sailors who undertook this training.

In 1981, the first Canada-Australia submarine officer exchange was established at the lieutenant-commander rank. An officer with previous experience in O-boat command, Lieutenant-Commander K.F. Pitt RAN arrived in Canada and took up duties as the Squadron Operations Officer (SOO). The SOO was the next senior officer in line from the Squadron Commander, and frequently was employed in an acting capacity in absence of the Commander. Thus, in his role as acting Submarine Operating Authority (SUBOPAUTH), the Australian exchange officer could control the movements and operational taskings of Canadian submarines.

The other half of the exchange was Canadian Lieutenant-Commander K.F. McMillan, who was appointed to a position in the shore establishment HMAS *Platypus* in Australia. At the time, Canada had not yet acquired the American Mk48 torpedo, and there was considerable American sensitivity over potential release of technical

27 The Command Team, from a submarine operations perspective, comprised the captain, attack co-ordinator (XO), local operations plot officer (navigator), sonar control officer, weapons control console operators, and contact evaluation plot operator, as well as a small number of other members of the Attack Team.

information. McMillan was denied the access he required to perform his job, so the billet was renegotiated and he subsequently was tasked with standing up the Australian Submarine Sea Training Group.[28] In Halifax, the same awkwardness over torpedo data meant that Pitt's tactical experience could not be drawn upon fully. Both officers returned to their respective nations in 1983, the assessment nonetheless being that the exchange had been a success and that there was value in its continuation.[29] In addition, during the previous year, the RAN had faced a serious shortage of junior officers in submarines, and asked whether Canada would consider loaning some officers. A sole officer, Lieutenant R.E. Bush, proceeded to Sydney and a sea-going appointment aboard HMAS *Oxley*.

By the late-1980s, Canada had decided to create its own independent Submarine Sea Training organization. As *Okanagan*'s SOUP refit was near completion in 1988, the RAN lieutenant-commander exchange position was reassigned from the squadron operations officer appointment to a new position as Officer-in-Charge, Submarine Sea Training Group (OIC SSTG). Lieutenant-Commander J.A. Diercks RAN, along with three Canadian non-commissioned members and a junior officer formed the first cadre of the group, and put *Okanagan* through her post-refit work-up. In effect this ended Canada's involvement with the RN Submarine Sea Training Staff for over a decade, until the transfer of the Upholder-class to Canada.

Impact of Perisher to Canada

During the period from the mid-1990s to the present, three key events had major impact on the both the character and the continued survival of the Canadian submarine service: the patriation to Canada of the Submarine Command Course; a major Canadian 'naval waterfront' force disposition reorganization in the Atlantic; and the announcement and acquisition of the Upholder-class submarines. To a lesser degree, the highly-publicised 1995 court-martial of a Canadian submarine captain validated the view of the navy's senior leadership that the First Canadian Submarine Squadron was adrift and needed greater oversight and control, and it too will be further discussed below.

Following a series of consecutive unsuccessful attempts at Perisher by Canadian officers in the late 1980s, the Commander of Maritime Command (MARCOM), then Vice-Admiral C.M. Thomas, ordered a comprehensive study of the full spectrum of personnel matters related to service in submarines. The study, completed in April 1988 and known as the "Pollard Report" (after it's principle compiler, Captain(N) David Pollard), identified poor preparation of candidates and lack of experience as the two main causes of the successive failures. It also recommended the institution of a Submarine

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28 The terms of the exchange changed literally while McMillan was flying to Australia. In the 2 months it took to get his employment sorted out once on the ground, McMillan's first job entailed traveling around Australia with a team recruiting for the Australian Submarine Service. Cmdre (ret'd) K.F. McMillan, personal email to author, 7 June 2010.

29 Canada, Department of National Defence, 1SM:1630-1 *First Canadian Submarine Squadron Annual Historical Report 1981*, 19 October 1982; 1SM:1630-1 *First Canadian Submarine Squadron Annual Historical Report 1983*, 5 March 1984.

Officer Continuation Course (SOCT) to better prepare officers to challenge Perisher. SOCTs were structured to run about 2-3 weeks, with roughly half of the time spent in the classroom and shore-based periscope trainer, and the other half at sea under the tutelage of a current submarine captain, and often the squadron commander. Conceptually, an officer would participate in a number of these 'mini-Perishers' on a progressive basis, so that by the time the officer challenged the real course, he would be ready for it. The first SOCT was run in 1988, and since then no fewer than 21 have been conducted. The effect of this new approach to officer preparation was an immediate improvement to the success rate of Perisher candidates; Canada went from a failure rate of 39 per cent (from 1978 to 1987) to not a single failure until 1993.[30]

In terms of connection to the Commonwealth and allied submarine services, places on SOCT have been offered at various times to foreign officers. For example, in October 1990, British officers from HMS *Onyx* (at the time in Canada on an operations exchange) participated in SOCT 2/90 aboard HMCS *Okanagan*. Seven Australian officers took part in at least five SOCTs, and Norway has sent five officers, spread over the years 2007, 2009, and 2010.

Since the stand-up of CANSUBRON ONE, Canada had used the RN Perisher as the only vehicle for training and assessing officers for submarine command. However, in the late-1980s, it became evident that Canada's relationship with this course was headed for change. In 1988 the RN changed the curriculum to reduce the complexity and duration of the Safety Phase, and there was concern in Canada that essential skills would not be consolidated on the course.[31] By 1992, the Squadron Commander, Captain J.A.Y. Plante, assessed that the RN Perisher had evolved to the point that it was no longer preparing officers for command, but rather to become executive officers who, with further experience, would develop into commanding officers. This was not what Canada required from the course; what were needed were officers ready to assume command immediately on completion of training.

Canada was not the only nation concerned about the direction in which the RN Perisher seemed to be headed. The RAN had considered developing an Australian Perisher based on the British model, but concluded that it was too expensive an option for a navy of its size.[32] There was some discussion with the Australians and the Dutch about all three nations collaborating on a course. The concept was that the Perisher would be run using combined assets of participating nations, with the location of the course and selection of the 'Teacher' (as the Submarine Command Course instructors were known) to be determined on a rotational basis. Canada withdrew from the discussion to proceed independently. Australia and the Netherlands eventually dropped the idea of a combined

30 Canada, Department of National Defence, *Report on the Personnel Structure of the Submarine Service of Canada*, 22 April 1988, 36 [no file number; copy held by author]. Also known as the Pollard Report; Pollard was the Commanding Officer of the Canadian Forces Maritime Warfare Centre and not a submariner, but was selected to undertake an independent investigation.

31 *Ibid.*

32 *Ibid*., 40.

course, the Dutch deciding to establish their own course, making a limited number of places available to the RAN.

In Canada, Captain Plante felt that it would be possible to develop a Canadian Perisher with minimal impact to fleet resources.[33] Commander MARCOM endorsed the proposal and over the next 18 months the Fleet School developed a qualification standard and plan. The first Canadian Perisher, based on the RN model, ran in 1994 with Commander R.M. Truscott as Teacher, and Lieutenant-Commander J.G.M. Dussault became the first officer qualified through the Canadian Submarine Command Course. A total of four Canadian Perisher courses were conducted from 1994 to 1999, and six Canadian officers achieved their submarine command tickets in this manner.

In practice, the Canadian Perisher proved difficult to sustain. The course was resource-intensive and thus expensive. The large concentration of platforms needed meant that Perisher sea phases could be scheduled only as components of larger fleet exercises, limiting the number of times that the course could be run. As well, by the late-1990s, the Oberons were over 30 years old, and plagued with unpredictable defects that frequently affected their ability to meet their operations schedules. With only three submarines from which to choose, if a submarine tasked to support Perisher became unserviceable and unable to proceed to sea, there was little flexibility to replace it with another.

The Court-Martial and the Waterfront Reorganization

In the fall of 1993, a Halifax newspaper reported allegations of physical and verbal abuse perpetrated by the commanding officer aboard HMCS *Ojibwa.* The officer in question, Lieutenant-Commander D.C. Marsaw, was later subjected to a court-martial. The trial split the submarine community into two camps: those who believed the charges were justified, and those who felt that Marsaw had been wrongly accused. A guilty verdict was rendered on five of seven charges. In the two years it took for the appeal process, Marsaw went on two hunger strikes, and a national TV current affairs program aired a one-sided segment that was sympathetic to Marsaw's cause. In 2007, the findings were overturned based on technical problems with the Crown's arguments.[34] The Navy was given the option to order a new trial, but by then Marsaw had become a civilian, and it was felt that it was in no one's interest to order another court martial. In any case, the damage had already been done to Marsaw and his career, as well as to the reputation of the Canadian submarine service.

Rather than entertain another lengthy legal process, the navy chose to address the organizational culture of the submarine service, and the systemic leadership issues that had allowed an individual such as Marsaw to achieve command.[35] The prevailing climate

33 Canada, Department of National Defence, 4500-1(DNR) *Final Report of the Canadian Submarine Command Study Team (SMCST) May 1992*, 25 May 1992.

34 Canada, Department of National Defence, *Court Martial Appeal Court of Canada Decision rendered September 10, 1997 in Lieutenant-Commander D.C. Marsaw v. Her Majesty the Queen (CMAC-395)* (Ottawa, 1997), 5.

35 Cdr M.E. Clark, "The Court Martial of Lieutenant-Commander Dean Marsaw: Lessons on

of large personnel reductions combined with extreme fiscal restraint imperatives provided the perfect opportunity and top cover.[36] Coincident with the investigation of Marsaw and the court martial, the naval leadership began plans for a radical restructuring and reduction in shore infrastructure to follow on from an earlier reorganization of fleet squadrons and ships. Between September 1994 and May 1995, the Commander Maritime Forces Atlantic (MARLANT) directed two studies to review and recommend a new waterfront organization for MARLANT.

Of specific interest to this discussion was the direction for a reorganization that would incorporate the First Canadian Submarine Squadron in an "innovative, non-traditional structure."[37] It was envisaged that considerable savings in person-years could be realized if support functions resident in the squadron and the existing maritime operations groups could be amalgamated.[38] The effect of this reorganization would be to relieve the submarine squadron commander of responsibility for the personnel administration, manning co-ordination, training, health services, logistics, and public and non-public funds. These responsibilities were transferred to the newly-created Fifth Maritime Operations Group (commanded by a naval captain and part of the fleet headquarters), or single points of responsibility at MARLANT HQ. The idea was "to amalgamate the Squadron with the Fleet instead of being a small elite/unique organization that tended to operate/struggle on its own with little support from the Command."[39]

The Disbandment of the First Canadian Submarine Squadron

As a consequence of the waterfront reorganization, the First Canadian Submarine Squadron officially was stood down on 7 February 1996. A new position, Commander Submarine Division, with a staff of two was established the same day as a component of the Fifth Maritime Operations Group. The remaining staff of 35 that had supported Canadian submarine operations in the Atlantic continued to do so, but as part of a larger Fleet organization. Since the fleet overall was its priority, not just submarines, over the following years its focus on submarine force generation diminished considerably.

The effect of the disbandment on the morale of the submarine community was acute. The divisiveness, emotion, and embarrassment stemming from the Marsaw affair were still fresh and ongoing. Spirits plummeted as the dissolution of CANSUBRON ONE was viewed by the rank and file as the slow, deliberate dismantling of the Canadian submarine service. A contributing factor to the low morale was the absence of a

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Culture, Leadership, and Accountability for the CF" (unpublished MDS thesis, Canadian Forces College, 2007).

36 During the "re-engineering" of the CF in the mid-1990s, the government required a 30,000-person reduction of regular force uniformed personnel. This was achieved through a generally voluntary early-retirement program known as the Force Reduction Program (FRP).

37 Canada, Department of National Defence, *Report of the Phase Two Waterfront Support Reorganization Working Group*, Halifax, 23 June 1995 [no file number; copy held by author].

38 *Ibid*.; Cdr (ret'd) N.P. Nicolson, personal email to author, 3 June 2010.

39 Cdr (ret'd) N.P. Nicolson, personal email to author, 3 June 2010; Cmdre (ret'd) K.F. McMillan, personal email to author, 7 June 2010.

government decision on the acquisition of the Upholders. Considerable scepticism existed among submariners, since by the time of the demise of the squadron in 1996 the Oberon replacement project had been running for 15 years without making any discernable headway. Senior submariners were ordered to "get on board" with the restructuring, and to quash any discussion of potential repercussions. Moreover, no official ceremony to mark the occasion was permitted. Submariners felt betrayed; some arranged for a squadron 'obituary' to be run in a local paper. These sentiments were not fleeting; years after the event, fellow submarine officers confided how frustrating it was to watch the squadron dissolve with not so much as a whimper. "Even the Airborne Regiment was allowed a final parade, and it had been disbanded in disgrace."[40]

The Second Big Wave Abroad

With the exception of the RAN SMXO course, by 1997 all submarine training had been patriated from abroad and institutionalized in Canada. The Canadian submarine service had managed to wean itself from its original mentor just as the Canadian Oberons were fading into the twilight of their service. This independence would be short-lived as Canada would again turn to the British in 1998 to provide virtually the entire submarine service with the requisite conversion training to be able to operate a fleet of Upholder-class submarines.

This conversion training was conducted in four waves that, in the original plan, were aligned with the individual reactivation schedules of the four Upholder-class boats. Each training wave consisted of 86 people: 52 crew members, 5 spare crew members who could provide redundancy for critical positions such as the commanding officer, and 29 non-crew positions for staff and infrastructure support. The conversion training was a mix of Upholder-unique and common-to-fleet courses that were provided at a number of locations in the UK.[41]

The duration of training was dependant on the submariner's occupation and lasted, for example, between one to eight months in the case of a cook as opposed to an acoustic electronics technician. Classroom training was buttressed by hands-on training in several Upholder-unique trainers. These consisted of a ship control trainer that utilized a full motion simulator and a mock-up of a section of control room. There were also machinery control, weapon handling and discharge system, tactical weapon system, and main propulsion switchboard trainers. Later, after the last wave of Canadians had completed conversion instruction in the UK, the simulators were dismantled, moved, and reassembled in Halifax.

A prerequisite for Upholder conversion coursing was that only Oberon-qualified submariners could proceed to the UK. An unintended consequence of this policy was a

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40 Communicated to author during a side-bar discussion at CANUS Submarine Staff Talks, 2001.

41 RN training base at HMS *Collingwood* and the RN engineering school at HMS *Sultan*, both in Portsmouth, and the RN submarine school at Fort Blockhouse, previously known as HMS *Dolphin*. Training Waves 3 and 4 attended the RN submarine school at HMS *Raleigh* in Plymouth. Cdr (ret'd) W.C. Irvine, personal email to author, 29 March 2010.

perceived reduction in the standard required for "earning one's dolphins" (as the badge denoting submarine qualification is known) during the period 1998 to 2000. Since the Oberons were to be retired, it was felt that it would be a waste of time and effort for new submariners to develop in-depth knowledge of O-class systems. The thrust of the assessment for dolphins was on the common knowledge required to be a submariner; it was understood that Upholder-class technical knowledge would be received in the UK. While this made inordinate sense, it resulted in a minor rift within the submarine community, as detractors of the "Great Dolphin Give-away" viewed with disdain those sailors who obtained their qualification under the abbreviated program.

In the UK, once Upholder conversion training had been completed, non-crew personnel returned to Canada, and the crew and spare crew moved to the reactivation shipyard at Barrow-in-Furness. Here they formed a crew under a British commanding officer, Lieutenant-Commander D. Lightfoot RN, and began their Upholder Submarine Qualification (USQ). Run by a dedicated RN Upholder Training Team (UTT), the USQ was a hands-on qualification program similar to earlier Oberon submarine qualification programs, but designed to produce an Upholder-qualified crewmember in 60 days.

Key elements of training had to be completed before a submarine was handed over to its crew for sea trials. They included operational certificate (OPCERT) training, ship control, machinery control, weapons launch and handling, blind pilotage, and command team training. In preparation for the transatlantic crossing to Canada, sea trials had to be carried out in UK waters. Prior to proceeding to sea, an RN sea training assessed 'fast cruise' set of pre-sailing drills was conducted with the submarine alongside. The boat then sailed for trials that incorporated at-sea training and safety assessments and deep water clearance certification. The UTT doubled as the core of an Upholder sea training team, and was reinforced by regular RN submarine sea training personnel. The period from fast cruise to acceptance and handover differed for each submarine, but averaged just over a month, that is, 35 days.

Once the boats arrived in Canada, submariners returned to the United Kingdom periodically to undertake courses specific to the Upholder-class that were unavailable or had yet to be developed in Canada. For example, records show that 12 Canadians took the UM276 Valenta diesel engine course in 2008/09, and during the same period 15 submariners underwent maintenance training on a variety of equipment, such as the autopilot, technical systems surveillance, static frequency conversion machines, gyro and search periscope, and miscellaneous sonar courses.[42]

The decision to acquire the Upholders not only saw a re-engagement with the Royal Navy, but also resulted in an expansion of co-operation with other allies. Delays in the re-activation of the Upholders left Canada without submarines for training new and existing submariners. Negotiations were undertaken with Australia to provide officers on loan to RAN submarines. This arrangement was beneficial to both nations since Australia again was experiencing a shortage of junior officers, and the submariners that Canada sent to the RAN were those officers getting ready for Perisher who needed further submarine sea time to round out their preparations.

42 PO2 M.G. Miller, DMTE 2-8-2, office email to author, 24 September 2009.

Another means to increase the at-sea experience of XO-level officers during the early years of Upholder class reactivation was a return to participation in the American PCO course. Places were negotiated on both Atlantic and Pacific fleet PCO courses, largely as an 'offset' for the supply of Canadian frigates during the ASW portion of the PCO sea phase. In 2003, Lieutenant-Commander J.A. Clarke became the first Canadian since the *Grilse* years to attend a USN PCO course. Since then, no fewer than twelve Canadian officers have undertaken this course, either as pre-Perisher training or post-Perisher for consolidation.

Delays with the Canadianization of HMC Ships *Victoria* and *Windsor* left the navy without submarines to conduct Canadian Perisher courses for a few years. By this stage, the Dutch had run several serials of their command course, one course annually in conjunction with the RN nuclear Perisher, sharing submarines, warships, and air assets for the course with the British. The Dutch agreed to reserve a place for Canada on their following courses. The initial two Canadians did not pass the Perisher; however, in 2004, Lieutenant-Commander L. Cassivi became the first Canadian to successfully challenge the Dutch course. Since then, two other Canadian officers attained their submarine command qualification through the RNLN.

By 2004, the Norwegian submarine service expressed interest in strengthening ties with Canada, and offered up a place on their version of Perisher. Although more oriented towards coastal operations than the Dutch version, Norway's course was based on the British model, and was deemed acceptable for Canadian command qualification. To date, six Canadians have passed the Norwegian Perisher, Lieutenant-Commander J.A. Clarke being the first, in 2004.

Importance of International Connections

From its genesis, the Canadian submarine service has relied on ties with its Commonwealth and allied counterparts for sustainment and survival. Until the plan for acquisition of the Upholder class, the Canadian navy appeared to approach submarine matters as an afterthought, or adjunct of the 'real' navy of the surface ships. This perception is not unique to Canada; submariners of all nationalities often feel more in common with their colleagues in other navies than they do with sailors of their own services. The bond among the underwater fraternity is formed from a sense of shared adversity that those in the surface fleet just cannot or choose not to understand. At least that is what submariners believe.

More importantly, this international bond fosters the establishment of trust. This trust exists amongst the British, Australian, Canadian, Dutch and Norwegian submarine services because all utilize tactics and procedures for diesel submarine employment that is premised on common doctrine, all have participated in exercises and operations with each other, and all have had various submariners at sea aboard each others' boats. Exchange tours, as well as participation in the RN Perisher, resulted in the development of networks of contacts within the Commonwealth and allied submarine services. The nature of these contacts is enduring; frequently officers advanced concomitantly in their own navies to become the heads of their respective submarine services, and sometimes

their own navies.[43] This was of significance for the Canadian submarine service, since the waterfront reorganization and the decision to base submarines on both coasts resulted in the diffusion of scarce submarine personnel as well as responsibility for submarines that effectively reduced support for submarine initiatives in general. For that reason alone there was an urgent need to maintain linkages with allied submarines services. As well, these connections paid dividends during lengthy periods when no Canadian submarines were running.

Two anecdotes follow as examples of the nature of the trust between Commonwealth submarine services. The first occurs at a relatively low level of service and seniority, and the second is of appreciably greater significance.

In June 1979, HMCS *Ojibwa* was deployed to the UK on an annual operations exchange. The boat was preparing to conduct Royal Marine Commando insertion and extraction 'dry drills' in Scotland. At anchor outside Campbelltown harbour, Australian submarine HMAS *Otama* was undergoing a post-build RN work-up and was in dire need of a watchkeeping officer. As *Ojibwa* sailed past, *Otama*'s commanding officer, Lieutenant-Commander F.V.R. Wolfe RAN, hailed his Canadian counterpart on non-secure VHF radio circuit, and enquired as to whether he could spare an officer. *Ojibwa*'s CO, Lieutenant-Commander J.T.O. Jones, volunteered the junior unqualified Part III officer,[44] who was transferred to the Australian boat as soon as *Ojibwa* berthed alongside. Sub-Lieutenant C.J.D. Soule reported aboard *Otama*, went on watch as Trimming Officer, and almost immediately had to respond to a simulated fire.

Soule describes his integration with the *Otama* crew as "seamless." Soule remained in the RAN boat for several weeks before returning to *Ojibwa*, by then operating near Gibraltar. On completion of the British work-up, HMAS *Otama* returned to Australia by way of Halifax where Soule joined the boat a second time as a replacement for another Australian. Soule stayed aboard again until San Diego, and describes his experience as follows:

For all intents and purposes I was employed as an Australian naval officer. In fact, I even got my Dolphins during the transit . . . When I returned to Canada a month later I returned to duty in a Canadian submarine as a qualified submariner. No one ever considered that I needed to re-qualify as a Canadian submariner, or be required to conduct a 'check ride' or similar validation. I just went back to 'the Biz.'[45]

Perhaps the most powerful manifestation of trust between allies was the appointment of a foreign officer to command another's submarine. As noted earlier, this had already happened in the UK as a standing exchange between the RN and RAN, but

43 RN SMCC 2/81 graduates VAdm M.B. MacLean and Admiral M. Stanhope respectively rose to become Canada's Chief of the Maritime Staff and the RN First Sea Lord. VAdm (ret'd) M.B. MacLean, personal email to author, 1 June 2010.

44 Borrowed from the British, the term Part III referred to a sailor or officer who was working on his submarine qualification. Non-qualified personnel were also referred to as SPUTs (Surface Pukes Under Training.)

45 Cdr C.J.D. Soule, personal email to author, 23 February 2010.

unusual circumstances also led to this occurring between Canada and Australia.[46] As a consequence of the RN exchange commanding officer having to return to the UK early, and while on exchange with the RAN as officer-in-charge of the sea training group and thus the spare crew CO, Lieutenant-Commander M.B. MacLean was appointed as commanding officer of two Australian submarines, HMA Submarines *Oxley* (Nov 84 to Jan 85) and *Orion* (April 1985). In doing so, MacLean became the sole Canadian officer ever to command an Australian submarine.[47]

In March 1984, due to the chronic shortage of submarine command-qualified officers in Canada, Lieutenant-Commander D.F. Webb RAN was appointed to command HMCS *Okanagan* while he was executing responsibilities as squadron operations officer. His command was an administrative appointment; the submarine was in refit, and Webb did not take *Okanagan* to sea beyond the harbour limits, although he did conduct a couple of 'hot moves' between the ammunition and submarine jetties. A few years later, after three successive Canadian Perisher failures, it became necessary to appoint Lieutenant-Commander R.D. Carter RAN in command of HMCS *Onondaga* in May 1987. He was relieved in December 1987 by Lieutenant-Commander J.A. Diercks RAN, who served as CO for seven months. Both Carter and Diercks took *Onondaga* to sea for exercises and operations.

Pre-existing relationships built through the underwater network have paid dividends during periods when a nation's submarines may be unavailable for serious maintenance or personnel issues. For example, on the basis of a single phone call to his opposite number in Australia, Captain J.A.Y. Plante was able in 1991 to despatch three officer trainees to finish their submarine qualifications with the RAN when Canadian submarines were sidelined due to class-wide hull valve defects.[48] The loans in 2009 of Canadian submarine sonar operators aboard the Dutch submarine HNLMS *Walrus* were arranged on the basis of a phone request through the Perisher connection existing between the head of the Netherlands submarine service, Captain P. de Harder, and the author.

Summary

Although Canada first operated submarines nearly a century ago, it has been only for the past five decades that the navy has maintained a permanent, uniquely Canadian submarine service. The roots of this service are traced back to both Britain and the United States; however, it is the former that filled the role of trainer and mentor throughout the Cold War period. Canadians were sent to the UK for training and employment in two 'waves'. The first, in the mid-1950s, formed the cadre of the First

46 As described earlier, a few Canadians commanded British submarines during the two World Wars, as well as during the 1950s and 1960s. However, post-war this would have been unusual, as the urgency brought on by war to find qualified COs would have no longer existed.

47 VAdm (ret'd) M.B. MacLean, personal email to author, 1 June 2010. MacLean took *Oxley* on a major international exercise and a port visit to New Zealand.

48 LCdr (ret'd) J.M. Reid interview by author, 25 February 2010, Ottawa, ON.

Canadian Submarine Squadron, and a late 1990s second wave allowed the Canadian navy to transition to a new class of submarine. In the intervening years, the British provided training, personnel exchange opportunities, and shared operations schedules that fostered adoption of common operating procedures.

As the Canadian submarine service came of age, there was a consistent effort to wean itself from the Royal Navy for reasons of economy as well as a desire for true independence. The 1980s modernization of the Oberon-class combat capability resulted in diminished reliance on the British, and a shift to closer ties with Commonwealth partner Australia. Moreover, during this period, Canada fostered linkages with allied submarine services, especially the Netherlands and Norway, to assist in training personnel as well as shaping submarine operational practices and doctrine.

The training of Canadian submariners remains a mixture of national courses as well as, for some, international ones. Some of the Canadian courses are truly home-grown in nature, while others have been patriated entirely or influenced heavily by the Royal Navy. The RN international Perisher was one of the most important courses for the Canadian submarine service for three reasons. First and foremost, it was the means by which Canadian commanding officers were trained, assessed, and qualified to an international standard. Second, the curriculum was derived from 'real' submarine operations against real threats, the Germans in the two world wars, and the Soviets in the Cold War. The curriculum shaped the tactical doctrine and operations procedures of the Commonwealth and allied submarine services as international students returned to their home nations to take up their commands. The third benefit of the international Perisher was the networking aspect of the course. The relationships built between students during the course lasted the duration of a career. These ties would prove most important during crises of personnel shortages or serious materiel deficiencies when 'horse-trading' of sailors between submarine services for training opportunities or personnel augmentation was necessary. The Netherlands and Norwegian Submarine Command Courses continue the RN tradition, and offer the same important benefits to Canada.

The importance of key connections with international senior submariners became apparent after a major 1996 restructuring of the navy that resulted, over time, in a diffusion of focus and support for the Canadian submarine service. Prudent use of the pre-established network for overseas training and employment kept Canadian submariners 'in the game' during the early years following the arrival of the Victoria class. As Canada's experience with the Victorias grows over the next couple of decades, the extant relationships nurtured with Commonwealth and allied submarine services will remain as important to the continued success of Canadian submarine operations as they have for the past 50 years.