

Political Parrying and Parsimony: The Sea King Helicopter and the Evolution of the Maritime Helicopter Project

The Canadian government's dilatory efforts to replace the *Sea King*, the Canadian anti-submarine warfare (ASW) helicopter, is an exceptional example of the current commitment-capability gap that exists in Canada due to the historical powerlessness of defence procurement officials within the civil-military relationship. The CH-124A *Sea King* maritime helicopter was first acquired for the Royal Canadian Navy (RCN) in 1963 and, despite recent progress on a new maritime helicopter project, it has remained in service far longer than is justified by the government. The aircraft have been dangerously outdated for over a decade, and the Canadian government's decision to cancel its belated replacement in 1993 is a clear demonstration that the needs of the Canadian Forces (CF) are often ignored due to political prevarication. One of the most unfortunate aspects of this political neglect of the Canadian military's capabilities is that the use of an ASW helicopter aboard destroyers and frigates - not simply aircraft carriers - was a strictly Canadian innovation. And it is presently used internationally by major military powers that have chosen to capitalize, rather than ignore, its potential. It is obvious that Canadian military advisors are consistently powerless against the duplicitous maneuvers of aspiring politicians. The Canadian government has known of the deteriorating capability of the *Sea King* since the 1980s and its blatant disregard for expert defence analysis concerning the military's obsolescent equipment not only hinders what the government can reasonably ask of the military - it places its soldiers in danger.

The RCN received its first rotary-wing aircraft, three Bell HTL-4s, in July 1951. By July 1955, the first ASW squadron, HS 50, had been formed. The unit was based in Shearwater, Nova Scotia, and was outfitted with six dipping sonar-equipped HO4S-3 helicopters, which were immediately used for the development of ASW tactics and procedures aboard the light fleet carrier HMCS *Magnificent* and its successor, HMCS *Bonaventure*. Although the helicopters gave the RCN a balanced ASW capability and proved that aircraft were competent in an ASW role, Canadian maritime warfare officials wanted to take the concept one step further and place the aircraft aboard a smaller ship deck. After all, Canada only had one carrier, and if the aircraft could be fit to fly from frigates and destroyers, this would vastly increase the capability of the RCN. Indeed, the very idea dates back to a memorandum from 1943.¹ Trials were carried out successfully in 1956 aboard the frigate HMCS *Buckingham* using the HO4S, which revealed that, although the idea was feasible and a brilliant force-multiplier could effectively be created, there was a need to rapidly secure the helicopter and reposition it on deck.²

The initial work to test the reliability of attaching a cable to a helicopter and then

¹ Stuart Soward, "Canadian Naval Aviation, 1915-69," in James A. Boutilier, ed. *The RCN in Retrospect, 1910-1968* (University of British Columbia, 1982), 278.

² For more on the development of the destroyer/frigate borne helicopter capability see J.D.F. Kealy and E.C. Russell, *A History of Canadian Naval Aviation* (Ottawa: Queens Printer, 1965); and Stuart Soward, *Hands to Flying Stations: A Recollective History of Canadian Naval Aviation, II, 1955-1969* (Victoria: Neptune, 1995).

using it to pull the aircraft down was done by the VX10 (Experimentation Squadron Ten). Before any design could be initiated, the concept of whether a helicopter could fly safely while being pulled by a tensioned wire had to be proven. Bert Mead remembered:

We had a Directive, which was rather an informal one, and I think that there was a bit of argument in Ottawa or somewhere about this being a stupid idea, because I recall I got a phone call in VX10 asking us to give some ideas on pulling a helicopter down. At any rate I went down to the old parade square down by C Hangar, we got a truck, rigged up a bunch of pulleys and all that sort of garbage and Bill Frayn came down, with an HO4S I believe it was, and we hooked on to him and the idea was to pull him down and see whether he lost control . . . after a couple of times when Bill cut loose because he was losing control, we finally got it down to the point where he could sit there, steady as the devil, and we could pull him down. . . . So this really was the beginning of that whole concept of operations.³

The impetus for the successful creation of a type of cable system for bringing a helicopter down onto the ship, was the fact that the RCN was considering the use of the Sikorsky *Sea King*, arguably the first helicopter designed expressly for naval applications, aboard its frigate/destroyer size warships.

On 20 November 1962, the Canadian Minister of Defence announced that approval had been given for the commencement of a program to equip the RCN with a new helicopter to help combat the surge in Russian submarine activity. On 24 May 1963, the Sikorsky CHSS-2 *Sea King* entered service in Canada; there were forty-one that were procured. It had two turbo-shaft engines, but could operate with only one if necessary, possessed all-weather and night operating capability, and it was amphibious. The HO4S had none of these capabilities. The *Sea King* was also the first helicopter to combine both hunter and killer capabilities: it could detect, identify, track, and destroy aggressor submarines.⁴

Once the *Sea King* entered service, it operated from the carrier HMCS *Bonaventure*. The RCN was originally looking for a helicopter smaller than the *Sea King* for their other vessels, but none could compete with the CHSS-2. The RCN then decided to try and use the same *Sea King* model on the smaller ships. Brigadier-General Colin Curleigh, the pilot of the very first *Sea King* in Canada and Commander of Maritime Air Group from 1986-89, explained how original the idea was at the time:

The RN [Royal Navy] initially operated the diminutive *Wasp* from some of its frigates, while the USN [United States Navy] took the unmanned route with its ill-fated Drone Anti-Submarine Helicopter. . . . the RCN embarked on a much more ambitious approach. . . . The momentous decision to investigate using the large *Sea King*, which was already being flown off the *Bonaventure*, quickly followed. Other navies thought we were crazy, and there were moments when we thought they could be right.⁵

³ This and the rest of the paragraph are based on Peter Charleton, *Nobody Told Us It Couldn't Be Done: The Story of the VX10* (published privately by Peter Charleton, 1995), 123-5.

⁴ "An Appraisal of the New Helicopter," *Crowsnest*, vol. 15, no. 1, (January, 1963); and Leo Pettipas, *Canadian Naval Aviation, 1945-1968* (published privately, 1990), 149.

⁵ This quote and the rest of the paragraph are based on Brigadier General Colin Curleigh, "The New Maritime Helicopter: Reliability Will be Crucial," *Canadian Defence Quarterly* (Summer, 1997), 26-7; see also "Wedding of the Sea King," *Crowsnest*, vol. 16, no. 3-4 (March-April, 1964).

The key for the new advancement, therefore, lay in the success of the Canadian invention of the Helicopter Hauldown and Rapid Securing Device, also known as the *Beartrap*, which was attached to a cable lowered by the aircraft. Between 1963 and 1966, all seven of the St. Laurent class destroyer-escorts were converted to the helicopter-carrying destroyer (DDH) class. This was done with the addition of a flight deck, hangar and twin funnels. Moreover, the two Annapolis class DDH vessels were commissioned in 1964, and both classes received the *Beartrap*. Canadian ingenuity influenced international naval doctrine and, as a testament to this, the RN and the USN copied the DDH concept soon after the success of wedding the *Sea King* to Canadian destroyers.

Even when the HMCS *Bonaventure* was retired from service by the Trudeau government in September 1969, the success of the DDH concept continued to prosper. Although the withdrawal of the *Bonaventure* was perceived by some as a “death blow” to Canadian naval aviation, the savings that resulted made it possible for the RCN to maintain more ships, such as the Tribal class destroyers (renamed Iroquois) commissioned in 1972-73. Concomitantly, the *Sea King* became an invaluable instrument by complementing the destroyer escorts ASW capability. The navy also commissioned two new Operational Support Ships (AORs), the *Protecteur* and the *Preserver*, which were fitted with facilities for helicopter operations and maintenance. Their hangars held up to three *Sea Kings*.⁶

By 1985, the replacement of the *Sea King* was becoming a serious topic. The aircraft, by then called the CH-124A, had been modernized between 1972 and 1977 to improve reliability. A *Sea King Improvement Program* was carried out, which combined a general refurbishing with the installation of crashworthy fuel cells, rotor-blade de-icing, strengthened crew seats, a radar altimeter warning system, an improved TACAN/DME readout, and Litton Canada AN/APS-503 radar. From 1975 to 1977, the program also added sonobuoy and marker chutes, dipping sonar improvements, and the ability to hover drop torpedoes. Some of these improvements, however, were illusory and other problems were still ignored. The sonobuoys, for example, could not be used independently from the ship, and the helicopter still lacked an appropriate acoustic processor. The simple fact that the *Sea King* was designed with 1950s technology made the aircraft increasingly inefficient and difficult to maintain. One author wrote at the time: “It may be, in fact, that there is no practical alternative to the earliest possible replacement of the *Sea King* fleet.”⁷

One deceptive consolation to the degenerating aircraft was that the 1975 Defence Structure Review foreshadowed relatively large increases in capital spending. But these increases were to be used on other initiatives such as the *Leopard* main battle tank, the *Aurora* long-range patrol aircraft, the CF-18A *Hornet* fighter aircraft and the *City* class

⁶ Soward, “Canadian Naval Aviation,” 283-84; Curleigh, “The New Maritime Helicopter,” 27.

⁷ This quote and the rest of the paragraph are based on Martin Shadwick, “Replacing the *Sea King*: Canada Examines the Need to Replace its *Sea Kings* with a new ASW helicopter,” *Canada’s Navy* (Annual, 1985), 164-5.

patrol frigates. The fact that funding for a new maritime helicopter was precluded by other important acquisitions by the military was somewhat acceptable in 1985; a modern military needs many weapons at its disposal and it is sometimes necessary to give certain projects priority to create a capability that did not previously exist. And the *Sea King* capability already existed; it was simply outdated and inadequate for the level of warfare being practiced in the 1980s.

The temporary neglect of what has been deemed a necessary piece of kit for the CF is often unavoidable, and hopefully a technological solution can be found during the interim. The main problem with procurement delays, is that the process takes an exceedingly long time from decision to delivery – often over five years – and every year that it is delayed may mean serious problems.⁸ The Canadian struggle between buying foreign equipment for its specific military requirements and building its own is a historical problem dating back to before the Great War and is beyond the ambit of this study.⁹ The fact was that the previous Canadian innovations in ASW warfare were now being stultified in the RCN by the fact that a new helicopter was needed to keep pace with the technological advancements in the field of naval aviation.

A helicopter is intrinsically a very complicated and possibly dangerous piece of equipment, and even a twenty-year service time is considered excellent. It became clear to the Department of National Defence (DND), therefore, that refurbishing would be too expensive, and the relative lack of speed and endurance, as well as a lack of a digital signal processor, could not be solved with any level of upgrade or retrofit. One author astutely stated: “Canada, with a defined role that still emphasizes an antisubmarine warfare role, has found herself in an embarrassing (sic) position with the aging *Sea King*. Once on the cutting edge of technology by placing a relatively heavy, ASW helicopter aboard a small warship such as a frigate, the Canadian Navy has seen its leadership eroded and surpassed by successive generations of helicopters in both the USN and RN.”¹⁰ During the summer of 1985, the decision was made to replace the *Sea King*.

In April of 1986, DND authorized the issuance of a Solicitation of Interest package for a New Shipborne Aircraft (NSA) project to about sixty companies. A small number of companies that could afford the costly process of responding to a Request for Proposal (RFP) – the eleven volume document that outlined what Canada needed in a

⁸ For example, the CF-100 *Canuck* jet-interceptor took far longer than expected – over five years – and missed the world market because of it; it was not ready when the Korean War started and Canada and the United States turned to the F-86 Sabre. See Randall Wakelam, *Flights of Fancy: RCAF Fighter Procurement 1945-1954* (Kingston: Masters Thesis, Royal Military College of Canada, 1997).

⁹ See William Johnston, “Canadian Defence Industrial Policy and Practice: A History,” *Canadian Defence Quarterly*, 18/6 Special no. 2 (June, 1989); Robert Bothwell, “Defence and Industry in Canada, 1935-1970,” in Benjamin Franklin Cooling, ed. *War, Business, and World Military-Industrial Complexes* (London: Kennikat Press, 1981); Col. W.N. Nelson, “The Need for a Viable Defence Industrial Base,” *Canadian Defence Quarterly*, 15 (Spring, 1986); David G. Haglund, ed. *Canada’s Defence Industrial Base: The Political Economy of Preparedness and Procurement* (Kingston: R.P. Frye, 1988).

¹⁰ Thomas Lynch, “Naval Shipborne Aircraft: Rotary Flight After the *Sea King*,” *Canada’s Navy* (Annual 1986), 98.

maritime helicopter – were expected to compete. Even before the profuse amounts of money were spent on the competition for the NSA contract, Canadian companies had already been working for two years on individual projects for the possible avionics and systems required for the helicopter. For example, Litton Systems of Canada and Canadian Marconi were working on a Helicopter Integrated Processing and Display System (HINPADS) and a Helicopter Integrated Navigational System (HINS). The three main companies that responded to the RFP were: Sikorsky, with the SH-60; EHI, formed by Westland and Augusta, with the EH-101, already procured by the RN to replace its *Sea Kings*; and Aerospatial's SA 332F1 *Super Puma*. Notwithstanding who the winner would be, the first helicopters were expected to become operational in 1995.¹¹

On 5 August 1986, the Canadian government approved the project definition phase of the NSA, which signaled that it was fully committed to the procurement process. The companies, foreign and Canadian alike, were justified in spending their money to try and fulfill the rigorous requirements of the RFP, which included expensive material at the time, such as a Global Positioning System (GPS). On 5 August 1987, Perrin Beatty, the Minister of Defence, announced that the Canadian government had made a decision. As Sikorsky had already dropped out after acquiring seven percent of Westland, the only real loser was Aerospatial. The EH-101 was chosen because it was a modern helicopter designed for naval specifications and the NSA Project Management Office (PMO) believed that the *Super Puma* simply could not meet Canada's naval needs, as it was designed as a land support helicopter for the French Army in the 1950s.¹²

Although EHI was a consortium of two Italian companies and one from the United Kingdom, the NSA required that there be a substantial amount of Canadian technology on board the new helicopter. EHI had, therefore, already made partners with the powerful Canadian companies of Bell Textron, Canadian Marconi, Pramax Electronics and IMP. The Canadian avionics industry was designing some of the most advanced ASW systems available, and all the competitors had maximized Canadian content in that area, thereby stimulating the developing Canadian aerospace industry.¹³ In addition, this meant that the EH-101 would be built for specific Canadian needs.

By 1992, the NSA program was still not completed and the imminent Canadian federal election threatened to disintegrate the entire venture. Moreover, with the change of Defence Minister, many felt that Marcel Masse may put the fledgling NSA program out of its misery and make the ultimate sacrifice of safety for the CF in exchange for budgetary cuts. Despite the serious fiscal restraint that followed, the NSA was spared. The thought at the time by defence officials was that it was simply impossible to cut a program that was both necessary and near completion. One analyst opined:

¹¹ Ibid, 99-100.

¹² Thomas Lynch, "New Shipborne Helicopter Program," *Canada's Navy* (Annual, 1987-88), 98-101 and idem., "Canada's NSA Program: And Then There was One," *Canada's Navy* (Annual, 1988-89), 116.

¹³ For specific Canadian avionics, such as signal processors, used by the EH-101 see Lynch, "Canada's NSA Program," 117-18.

As to the unthinkable alternative of cancelling the NSA program, apart from the loss of money already spent or committed plus cancellation charges, it must be recognized that the new frigates are reckoned to be only about 60 percent effective without helicopters. Apart from this, the NSA is still regarded by DND as a sacrosanct program that it is essential to carry through.¹⁴

Sadly, the program was not deemed as important by the new Canadian government. The NSA program and the EH-101 contract were cancelled in 1993 after Jean Chretien and the Liberal government – historically inimical towards the military – took power in 1993. Chretien had accused the Conservative government of Brian Mulroney of squandering taxpayers' money. But not only did the new Liberal government nullify approximately nine years of work and investment, it also paid an appalling fee of close to half a billion dollars to cancel the contract.¹⁵

While it is true that the major sub-threat ended with the end of the Cold War, the Canadian military relied on these for much more than ASW. Secondary roles included search and rescue (SAR), medical evacuation, and vertical replenishment. The year after the *Sea King* was cancelled, the *1994 Defence White Paper* acknowledged that, “there is an urgent need for robust and capable new shipborne helicopters. The *Sea Kings* are rapidly approaching the end of their operational life. Work will, therefore, begin immediately to identify options and plans to put into service new affordable replacement helicopters by the end of the decade.”¹⁶ A further study by the Library of Parliament has forcefully explained why the *Sea Kings* still needed to be replaced:

Although the submarine threat has greatly diminished with the end of the Cold War, military planners still consider it necessary for Canada's maritime forces to have some ASW capability, if only for the protection of Canadian warships involved in NATO or UN operations. Regardless of any ASW equipment, the helicopter replacing the *Sea King* would still complement the capabilities of Canadian ships by providing surveillance above and around them, by transporting supplies and personnel, and by carrying out rescue missions when required. *Sea Kings* were used extensively in the Persian Gulf and the Adriatic Sea, as well as for inspecting cargo ships as part of the enforcement of UN sanctions against Haiti; they were also used to transport supplies for UN peacekeepers in Somalia.¹⁷

The cancellation of the NSA program showed a lack of understanding of the military's use of equipment by the Canadian government. The cancellation also demonstrated an ostensible unawareness of the information the military had provided since the 1980s. It is unfortunate that the Canadian government would abandon a military technology that Canada could take credit for assembling – the *Beartrap/Sea King*/frigate combination – in an century where Canada has relied heavily on external innovations of military technology, or failed in its own innovations.¹⁸ But the real tragedy is that the Canadian

¹⁴ David Godfrey, “Procuring Canada's New Helicopters: Still Firmly on the Rails, the Canadian Navy's New Shipborne Aircraft Program has Survived Severe Cutbacks in Defence Spending,” *Canada's Navy* (Annual, 1991-2), 38.

¹⁵ Joseph T. Jockel, *The Canadian Forces: Hard Choices, Soft Power* (Toronto: The Canadian Institute of Strategic Studies, 1999), 75.

¹⁶ *1994 Defence White Paper*, Canada, Department of National Defence (Ottawa: Canada Communication Group, 1994), 46.

¹⁷ Jockel, *The Canadian Forces*, 75.

¹⁸ See R.G. Haycock, “Early Canadian Weapons Acquisition: “That Damned Ross Rifle,” *Canadian Defence Quarterly* (Winter, 1984-85); among the innumerable books on the Arrow see Grieg Stewart,

government still expects its military airmen to fly these dangerously obsolete aircraft.

The *Sea Kings* currently need over thirty man hours for every one hour in the air, excluding the time that is spent on major overhauls at the contractors due to antiquated technology. A review of Canadian defence spending in 2000 by the Military Affairs and Defence Committee concluded, “. . . each and every one [Sea King] is an accident waiting to happen.”¹⁹ Twelve of the original forty-one *Sea Kings* have crashed, including the ditching of one of the aircraft in the Pacific Ocean off Hawaii during a training exercise last summer. Between 1967 and 1994, seven crew were killed in eleven *Sea King* crashes. The remaining twenty-nine *Sea Kings* require extensive maintenance and are prone to breakdowns.²⁰ In a scathing letter to Prime Minister Chretien in March, retired Lt.-Col. Laurie Hawn wrote: “Sir, I hope for their sake that your legacy will not be blood-stained by the loss of loyal aircrews in the Sea King, during the years when they should have been serving us in their new aircraft,”²¹

On 17 August 2000, the Ministers of Public Works and National Defence made a joint announcement that the Crown Project to replace the CF's *Sea King* helicopter fleet would commence immediately. The project is now currently underway and the government's stated objective is to have the competition for the "Basic Vehicle" completed before the end of 2001. All deliveries are to be completed by the end of 2008. Notwithstanding the fact that the replacement of the *Sea King* will be over a decade late, it appears that the paradigm for the acquisition is already flawed. With the split and staggered process and the principle of "lowest cost compliance" that the government has chosen, it is not clear who will pay for the modifications to the airframe that the systems contractor requires in order to fit the mission suite equipment into the basic helicopter. Nor is it made clear who will manufacture, modify, and then re-certify the modified helicopter as airworthy once all of this is done. And where will the money come from? More importantly, who will be held accountable when the extra modifications and work required result in unforeseeable project and delivery delays? As one critic exclaimed: “It appears in the case of the Maritime Helicopter Project that the government has chosen to ignore its own procurement regulations without explanation or accountability.”²²

Shutting Down the National Dream: A.V. Roe and the Tragedy of the Avro Arrow (Toronto, 1988). It must be noted that Canada has also had some successes. For example, the Canadian designed tank turret that was used in the Canadian *Ram* and the American M-4 *Sherman* tank – the most widely used tank in the Second World War. See "The Armoured Corps Story," Canadian Forces, *Sentinel* (June 1966), 32-33.

¹⁹ “Lack of Money: The Root of All Evil?” paper produced by the *Military Affairs and Defence Committee* (Royal Canadian Military Institute, 2000), 3. Things such as excessive vibration, which causes structural and crew fatigue, as well as failure of avionic components has caused ubiquitous problems in the 1990s.

²⁰ In one recent instance of irony, a *Sea King* broke down on its way to retrieve Canadian equipment commanded by a private company aboard the GTS *Katie*. The crew had to rely on the personal cellular telephone of one of its technicians to call its base for help. See Mike Blanchfield, “Sea King crew used cellphone to get help,” 29 April 2001, *Ottawa Citizen*.

²¹ Mike Blanchfield, “Pilot to PM: It's Your Fault if Someone Dies in Sea King,” 30 April 2001, *Ottawa Citizen*.

²² This quote and the rest of the paragraph were retrieved from Col. (retired) Lee Myrhaugen, “Maritime Helicopter Procurement Process,” from www.naval.ca/article/ retrieved 19 June 2001. For more on the official procurement process for the maritime helicopter project see the DND web site at

Opposition critics have claimed that Mr. Chretien is determined to avoid the political embarrassment that would come from purchasing aircraft from the same company he rejected so publicly and at considerable taxpayer expense after his 1993 election. EHI has already taken the government to court because, it claims, by insisting on the lowest initial price, rather than the best long-term value, the government has eliminated EHI, the firm that builds the three-engine *Cormorant* (EH-101). As a result the Federal Court of Canada has entered into the debate and in a March 9 ruling, the court said it was possible the government had meddled in the helicopter deal.²³

It appears that despite the biggest procurement fiasco in Canadian history, the Liberal government seems set to replay the scene. The Canadian government must give more credence to the fact that, if Canadians wish to enjoy the benefits of collective defence, it must participate in the ideal; thereby, allocating adequate finances to its own military for modern equipment purchases.²⁴ The alternative is to limit the missions that the government sends the military on and, as a corollary, limit its international influence. The commitment-capability gap that exists today is simply too great. As one analyst has correctly stated, “. . . the government must be persuaded to limit the commitments of the CF to those roles which it is willing to adequately support financially and politically.”²⁵ It is understood that not every modern piece of weaponry can be acquired at the same time due to limited resources, but the Canadian government also cannot ignore when it is placing its soldiers in danger. A ten year window was ample time for the Canadian government to prove that it was concerned about its airmen. Ironically, Canada has suppressed the DDH idea that it was responsible for. And the main culprits for this technological asphyxiation were aspiring politicians that did not understand, or simply did not care, about the welfare of the Canadian soldier. The example of the *Sea King* highlights the civil-military conflict in Canada regarding military procurement, and continued efforts must be made within the defence community to ensure that the political will is there to safeguard the future capability and security of the Canadian Forces.

http://www.dnd.ca/admmat/mhp/docs_e.html.

²³ Mike Blanchfield, “New Storm Brews Over Sea Kings,” 15 April 2001, *Ottawa Citizen*.

²⁴ Canada spent 42% less than the average defence expenditure of the other NATO members in 1998, *The Military Balance*, 1999-2000. International Institute of Strategic Studies. Table 50.

²⁵ Joel J. Sokolsky, “How Should the Canadian Forces Be Organized and Equipped for the Modern World,” Conference of Defence Associations, Ninth Annual Seminar (Ottawa: Conference of Defence Associations, 1993), 55.