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"The Worst Procurement in the History of Canada"

Solving the Maritime Helicopter Crisis

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ACRONYMS

ASW Anti-Submarine Warfare

C^4ISR Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance

CFB Canadian Forces Base

CFDS Canada First Defence Strategy

CVBG Aircraft Carrier Battle Group

DND Department of National Defence

FAA Federal Aviation Administration

EHI European Helicopter Industries

IRB Industrial and Regional Benefits

MCR Mission Capable Rate

MDMS Mission Data Management System

MHP Maritime Helicopter Project

NFH NATO Frigate Helicopter

NSA New Shipborne Aircraft Project

NSH New Search and Rescue Helicopter Project

SAR Search and Rescue

TG Task Group

VERTREP Vertical Replenishment

"The Worst Procurement In the History of Canada"

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Solving the Maritime Helicopter Crisis

Introduction

This year is the 50th anniversary of the Sea King's entry into service with the Canadian Navy. Unlike the Naval Centennial in 2010, it is doubtful that this anniversary will be celebrated with much pomp and circumstance.

The procurement process to replace the Sea Kings began in 1995.[1] The planned replacements, Sikorsky CH-148 Cyclones, are now more than four years overdue. It was recently reported that the Canadian government is re-negotiating the Maritime Helicopter Project (MHP) contract with Sikorsky, a process that will likely lead to more delays and cost overruns.[2]

The Sea Kings entered service between 1963 and 1969 to perform Anti-Submarine Warfare (ASW).[3] Although the Sea Kings were highly capable helicopters at the time, it was recognized as early as 1975 that a replacement should be identified.[4] The first attempt at a replacement occurred in 1990 when the Progressive Conservative government of Brian Mulroney signed a contract with European Helicopter Industries (EHI) for the EH-101. The proposed acquisition of the EH-101 was to replace helicopters for both the

* Defence Minister Peter MacKay, speaking in Halifax on July 10, 2012.

Search and Rescue (SAR) and naval units of the Canadian Forces.[5] The Liberal opposition criticized the EH-101 as the Cadillac of maritime helicopters and an unnecessary expense during a time of fiscal restraint. The projected cost of the program was $4.4 billion (in 1990 dollars).[6] The Liberal government of Jean Chrétien promptly cancelled the contract when it took office in 1993, but was subsequently required to pay $478 million in penalties to EHI.[7]

In November 2004, the Liberal government of Paul Martin announced that Canada would acquire 28 CH-148 Cyclone helicopters from Sikorsky.[8] Initially, the delivery of the first fully operational helicopter was to take place in 2005. This was later postponed to 2008 and then to 2012.[9] At the time of writing (February 2013) there has been no delivery and, as mentioned above, the contract is reportedly being re-negotiated.[10] There is little publicly available information concerning the negotiations.

Greg Hayes, Sikorsky's Chief Financial Officer, stated during the company's 2012 third-quarter earnings call that "Until we have an agreement with the Canadian government in terms of the final configuration and an interim configuration, we really can't ship anything."[11] This suggests the helicopter is still in development and the renegotiations will, consequently, likely involve additional program costs and restructuring of the delivery schedule. Sikorsky now promises that the initial delivery of eight Cyclone helicopters will begin in 2013.[12] But there have been such promises before.

In 2010 then Auditor General Sheila Fraser issued a scathing report on Canada's acquisition process for military helicopters. The report detailed how the Department of National Defence (DND) underestimated the cost and understated the risks involved.[13] The Auditor General's report also raised the question of whether a "low-cost procurement strategy is compatible with the acquisition of complex military equipment requiring significant development."[14] By "significant development," the Attorney General was referring to the fact that Sikorsky had never produced a finished CH-148 Cyclone for any buyer. The process of designing, building and testing a new multipurpose helicopter has seriously delayed Canada's procurement.

Project costs have increased throughout, with Canada now committed for over $1.2 billion more than the original contract. This number includes additional funds allocated to the project as well as $340 million for infrastructure costs not acknowledged at the time. Also not included are the costs of keeping the Sea King fleet operational during the interim, which were estimated to be upwards of $500 million in 2012.[15] Nor does it include the cost of modifications to the landing platforms on Canada's existing naval ships to accommodate the CH-148 Cyclone. An ongoing lack of transparen-

CH-124 Sea King (Photo Department of National Defence)

cy makes it difficult to determine what has gone wrong and when Canada's first fully operational helicopter will be delivered.[16] This raises the underlying and uncomfortable question of whether Canada should simply cancel the contract and start the procurement process over again.

History of a Failed Procurement

1. 1999 Statement of Operational Requirements

The operational lifespan of the Sea King helicopter fleet has been greatly exceeded. Seven years ago they were being described as "ancient," "geriatric," "venerable" and "flying coffins."[17]

Sea King operations suffer because of a lack of spare parts, increasing maintenance hours, and concerns resulting from accidents. Between 1995 and 1998, the Auditor General found the Mission Capable Rate (MCR) of Sea Kings fell from 42% to 29%.[18] The number of "aborts" increased substantially — to more than 60 aborts per 1,000 flight-hours — between 1990 and 2000.[19] By the year 2000 an average of 30 hours of maintenance was required per flight-hour.[20]

The Sea King was originally designed as "a single role anti-submarine warfare (ASW) helicopter."[21] That focused operational role was reflective of the time, which was early in the Cold War. As the role of helicopter support changed, the Sea King has been adapted to provide a multi-role "organic air" capability for Canada's navy.[22] In addition to its anti-submarine warfare role, the Sea King is now tasked with providing over-the-horizon situational awareness and SAR, as well as serving in anti-piracy, disaster relief and humanitarian operations.[23]

In 1999, the Department of National Defence produced a Statement of Operational Requirements (SOR) for the Sea King replacements.[24] One of the roles specified in the SOR is Vertical Replenishment (VERTREP), namely, the moving of supplies with an external cargo hook. The SOR set a minimal external cargo capacity requirement of 5,000 pounds.

The 1999 SOR also specified that the new maritime helicopters must be capable of enduring "extremes of temperature, wind, humidity, icing, salt spray, and turbulence typical of operations ranging from Canada's sub-Arctic to tropical locations throughout the world."[25] This was to avoid the need to reconfigure helicopters on a sortie-to-sortie basis, which was considered unacceptably dangerous (e.g., during high seas) and overly demanding on personnel.[26]

The 1999 SOR also included a requirement that the helicopters could float upright for a "minimum of two minutes in sea-state three."[27] Sea-state three denotes wave heights of between 0.50 and 1.25 metres.[28] The SOR also stipulated it would be desirable for the helicopter to remain floating indefinitely to allow, not just for the escape of the personnel, but also for the recovery of the aircraft.[29]

The SOR further specified that the new helicopters must be interoperable with other naval equipment, including the ships and aircraft belonging to allies. It assumed that many 21st-century naval operations would take place in an "integrated, network-centric architecture…such as that described in the United States Navy's Cooperative Engagement."[30] A network-centric architecture involves the sharing of operational data in real time between all participants in the operational theatre: ships, aircraft, and even ground personnel on shore. The linking of Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C^4ISR) assets is becoming the norm for NATO navies.

The 1999 SOR now seems dated. For example, it required that the new helicopters include a Mission Data Management System (MDMS) capable of "displaying a geographic area of at least 1,024nm [nautical mile] by 1,024nm

with the ability to change scales and re-centre to any portion of the area without the loss of data."[31] In 2013, most personal smartphones have this capability with GoogleMaps.

2. Phase One (The Mulroney Government)

During the two successive Mulroney governments there were two procurement projects concerning helicopters for the Canadian Forces. These were the New Shipborne Aircraft (NSA) project, concentrated solely on the replacement of the Sea Kings for the Navy, and the New Search and Rescue Helicopter (NSH) project. On 30 December 1990, EHI was awarded a combined contract for the NSA and NSH projects totalling fifty helicopters.[32] Thirty-five were slated for the Navy and fifteen for SAR.

The characterization of the EH-101 by the Liberal opposition as the Cadillac of maritime helicopters was an accurate analogy to the extent that it was larger and more powerful than the other candidates.[33] However, the Liberals' criticism focused on the $4.4 billion cost of the EH-101s during a time that called for fiscal restraint. They succeeded in making this a significant election issue.

3. Phase Two (The Chrétien Government)

In 1993 the Liberals were elected on a campaign platform that included cancelling the EH-101 contract. Prime Minister Jean Chrétien lived up to his promise, cancelling the procurement contract within hours of taking office.[34] His government then hired the Washington office of KPMG to determine whether it could avoid paying a penalty to EHI. KPMG determined the procurement process had been conducted appropriately and a cancellation fee consequently needed to be paid. At this point, the government sought additional advice.[35] Both Retired Ontario Supreme Court Justice Charles Dubin and the law firm Lang Michener concluded there were no legal loopholes that could be utilized to back out from the procurement deal.[36] The Liberal government ultimately paid EHI a $478 million cancellation fee without receiving a single helicopter.[37]

A concern during the selection of the EH-101 was that, at the time, it was not deployed in any other country's military. Specifically, the concern was that if Canada purchased the first production line of the helicopter, the risk of mechanical issues needing resolution after the aircraft entered service

EH-101/CH-149 Cormorant (Photo Department of National Defence)

would be high.[38] These concerns were partly abated when Britain's Royal Navy signed a contract for the first production line of the EH-101 in October 1991.

This concern about acquiring a first production line should have been prominent a decade later during the procurement process for the CH-148 Cyclone. In the case of the Cyclones, not only was the military variant not yet in production; it was still in its design phase.

4. EH-101 Selected For Search and Rescue

Another competitive selection process started after the EH-101 contract was cancelled in 1993. The renewed process was only for search and rescue helicopters. This process came to the same conclusion: the EH-101 was the best aircraft. However, DND and Public Works and Government Services did not immediately share this conclusion with the government. The concern was that announcing the EH-101 as the winner would cause embarrassment to Prime Minister Chrétien.[39] But eventually, in January 1998, EHI was awarded the SAR contract for fifteen EH-101 helicopters for a total of $790 million.[40]

In 2002, the EH-101 entered into service in Canada under the designation CH-149 Cormorant. The British, for their part, designated their EH-

101s as EH-101 Merlin. Both fleets of these helicopters suffered from design flaws that led to persistent cracking in the tail rotor-hubs. This led to higher maintenance requirements and associated costs that were almost twice what was originally forecasted.[41] Due to the cracking issue, inspections of the Cormorants' tail rotors were changed to once every 25 flight-hours rather than once every 50 flight-hours.[42] Just three years after entering service, the MCR of Canada's Cormorants "dropped to a 12-month average of 45%."[43]

In February 2004 all four Cormorants based in Gander, Newfoundland, were inoperable due to mechanical issues.[44] In addition to the cracks in the tail rotors, corrosion in the fuel tank area had become a problem.[45] The entire Cormorant fleet was limited to performing actual search and rescue missions. Even this posed a risk to the helicopter crews and those they were rescuing.[46] Training operations resumed a week later, after fuel lines across the fleet were inspected,[47] but two months later the Cormorant fleet was once again limited to SAR duties — after a British EH-101 Merlin crashed.[48]

The experience of design flaws with the Cormorant should have been heeded during the later procurement of another not-yet-fully-developed aircraft, namely the CH-148 Cyclone.

5. CH-148 Cyclone Chosen For Maritime Helicopter

In March 2003 two manufacturers, Sikorsky and AgustaWestland (formerly EHI), were identified as being compliant with the 1999 SOR for new maritime helicopters.[49] Both submitted bids that were "evaluated based on compliance with the technical requirements, industrial and regional benefits, and lowest overall price."[50] In November 2004, the new Paul Martin government announced its intention to procure 28 CH-148 Cyclone helicopters from Sikorsky.[51] Two contracts were signed: one for acquisition of the aircraft totalling $1.8 billion and a second for in-service support totalling $3.2 billion.[52]

General Dynamics Canada is the primary sub-contractor delivering advanced mission systems and support services for the CH-148 Cyclones.[53] Although Canada is procuring 28 Cyclones, only 15 will be in active service. The other 13 will serve as support helicopters in the following roles: "3 for training, 1 for flight-testing, 5 for scheduled maintenance, and 4 for attrition."[54]

CH-148 Cyclone (Photo Department of National Defence)

6. Problems With the Civilian Version of the Cyclone

The CH-148 Cyclone is based on a civilian variant, the Sikorsky S-92, which currently operates with the U.K. Maritime and Coastguard Agency[55] as well as Canadian-based Cougar Helicopters.

Although the CH-148 Cyclone is the first military variant of the S-92, the Department of National Defence decided the development risk of the Cyclone project was manageable. According to the Auditor General's Office, the overall project risk was assessed to be "low to medium" because the Cyclone was considered to be non-developmental as it would be utilizing "off-the-shelf" technologies.[56] This has proved to be illusory.

A serious problem concerns the main gearbox. The U.S. Federal Aviation Authority (FAA) had stipulated that main gearboxes must remain operational for 30 minutes after a total loss of oil. Canada's 1999 SOR included the same requirement.[57] The 30-minute dry run capability originates with the U.S. military's requirement for the helicopter's rotor system to be "ballistically tolerant," meaning that should a bullet cause the main gearbox's oil to escape it would continue to operate for at least 30 minutes.[58]

The FAA granted the S-92 "Category A" certification in December 2002.[59] This was after several tests in which the main gearbox did not successfully complete the 30-minute dry run, although a bypass value was added that would maintain an oil reserve — if activated by the pilot within five seconds of illumination of the main gearbox oil warning light.[60] In 2003 Sikorsky claimed the S-92 was capable of "30 minutes safe operation following an oil leak."[61]

In March 2009, a S-92 operated by Cougar Helicopters crashed off the coast of Newfoundland, killing 17 people.[62] The helicopter had been built in 2006 and had flown less than 2,200 hours.[63] Canada's Transport Safety Board concluded that the S-92 suffered from mechanical failure of the titanium studs in the main gearbox. Although the titanium studs were anodized to increase resilience to corrosion, wear and galling, they were still susceptible to wear and galling.[64] Two of the three titanium studs had sheared, which caused the main gearbox filter bowl assembly to displace.[65] Similar corrosion and wear had caused the crash of another S-92 in Australia in 2008.[66] The Transport Safety Board later stated: "Both Sikorsky and the FAA indicated that a loss of lubricant from the [main gearbox] oil filter bowl due to a failure of its attaching fasteners was not considered when performing the initial design assessment based on past service history."[67]

According to the Transport Safety Board, Sikorsky never publicly admitted that its original marketing information concerning the dry run capability was inaccurate.[68] The CH-148 Cyclone newsletter continued to claim that the "S-92 is the first helicopter in the world certified to the latest U.S. Federal Aviation Administration and European airworthiness safety standards without any exceptions or waivers."[69]

In 2009, Defence Minister Peter MacKay reassured Canadians that DND would not accept a Cyclone helicopter unless it met the requirements laid out in the contract.[70] Sikorsky spokesman Paul Jackson said the gearbox in the Cyclone would be different from that in the S-92 but gave no other details.[71]

7. Escalating Costs

The costs of the CH-148 Cyclone have grown substantially. Full and final costs remain unclear. According to the Auditor General, in 2000, "total indicative costs of the 28 maritime helicopters were estimated at $2.8 billion and revised to $3.1 billion in 2003."[72] These figures did not include the in-service support contract for maintenance and support.

In 2010 the Auditor General estimated the cost at $5.7 billion over 20 years with this estimate not including "contracted Sea King support, new infrastructure, Canadian Forces personnel, and ongoing operating costs."[73]

The Auditor General also warned that some of the full-life-cycle costs were not presented at key decision points and that "National Defence cannot adequately plan to have sufficient funds available for long-term operations and support of the helicopter. Moreover, without sufficient funds, National Defence may have to curtail planned training and operations."[74]

The Auditor General's significantly higher estimate is the result of several developments in the CH-148 Cyclone procurement program. In 2005 DND decided new "maintenance, spare parts warehousing, training and squadron facilities" were needed, and $340 million was committed for this purpose.[75] In December 2008 the Harper government committed a further $117 million to Sikorsky, in addition to Canada's then current contract obligations.[76] The $117 million was divided between an additional $77 million for the acquisition of the helicopters and $40 million for 20 years of in-service support.[77] Although it is not clear as to where precisely the additional funding will go, it seems to have been directed at equipping the aircraft with additional high-tech armaments and electronics.[78] This situation is discussed below.

In November 2007 an additional $168 million was committed to enable the Sea King fleet to remain operational until 2014.[79] In 2012, it was reported this cost had escalated to $500 million.[80]

8. Lengthening Delays

According to the 2004 contract the first fully operational CH-148 Cyclone was to be delivered to Canada no later than 30 November 2008, with another helicopter to follow each month.[81] At the time of writing (February 2013) there has not been a single delivery. In September 2012, DND admitted "some critical work remains outstanding before the Canadian Forces can take formal delivery of the first interim maritime helicopters."[82]

The delays have caught the Royal Canadian Navy off guard. The Cyclone has different landing gear from the Sea King and, as mentioned above, the landing decks on Canada's ships needed refitting to accommodate the new helicopters. In anticipation of a 2012 delivery, the Navy refitted the landing deck of the *HMCS Regina*. But as a result of the delays, they have had to change the landing deck back to re-accommodate the Sea King.[83]

9. "Requirements Creep"

Another problem has been the "Canadianization" requirements added by DND after the contract for the CH-148 Cyclones was signed. In 2008, Sikorsky informed the government the delivery of the helicopters was delayed because of additional work "directed by or caused by the Crown."[84] Adding further requirements to a project is known as "requirements creep." This means DND signed the contract without allowing for changes in the future needs or roles of the helicopter. They may even have done so with the intent of altering the technical specifications after the Canadian government was committed to the project and after a budget for the project had been approved.

One of the changes called for additional power reserves, which means more powerful engines.[85] Upgrading to more powerful engines may well have to do with the Canadianization of the aircraft. In other words, as additional electronics equipment and weapons systems increased the weight of the helicopter, Sikorsky was forced to fit the Cyclone with new, more powerful engines.[86] The new engine, which is being built and designed by General Electric, was tested and certified in June 2012.[87]

Back in 1999, the SOR stipulated the helicopter chosen would need to handle a 10 percent growth in payload over its operational lifespan.[88] Now, it seems this anticipated growth in payload has already been exceeded. According to the Auditor General's report, Public Works estimated this "increased the costs of the contracts by $84 million for the growth potential."[89] For as one military official reportedly said, "'You have no idea how hard it has been' to re-engineer the aircraft."[90]

In July 2012 Minister of National Defence Peter MacKay publicly stated the CH-148 Cyclone is "the worst procurement deal in Canadian history."[91] Although a re-negotiation of the contract is reportedly underway, the Harper government has been in charge of the file since February 2006 and therefore oversaw most of the cost overruns and delays. If it still makes sense to re-negotiate the contract, this must mean the Cyclone is not close to completion. And because the government is dealing with a single manufacturer, it is left in a weak negotiating position regarding cost increases and revised delivery schedules.

Back in January 2008, Defence Minister MacKay indicated the government was in a position to impose between $36 million and $89 million in late penalties (also referred to as "liquidated damages") on Sikorsky for failing to meet project deadlines.[92] Three years later, the government indicated a much-reduced penalty of $8 million. Even those funds had not been re-

ceived by January 2012, and the government is apparently not actively pursuing collection.[93]

One reason for the lack of collection seems to be that DND and Public Works introduced new requirements for the helicopter after the contract was signed. Sikorsky therefore might have a basis for legal action against the government if they are fined. This may also explain why Public Works reduced the penalty from $250,000 per day in the original Request for Proposal to $100,000 a day, and why it capped that penalty at one year.[94]

Canada thus finds has itself between a rock and a hard place, unable to secure new helicopters without pressuring Sikorsky, and unable to pressure Sikorsky for fear of being sued.

10. Industrial and Regional Benefits

As part of its bid Sikorsky committed more than $4.5 billion to Canadian industrial activity.[95] According to the Department of National Defence, Sikorsky has partnered with over 170 businesses across Canada.[96] It is unclear how many of those businesses will benefit from additional work if and when other international orders are made for the CH-148 Cyclone. Canada is presently Sikorsky's only customer for the aircraft. The German Navy has expressed interest but is also looking closely at the NH-90.[97] A representative for the German Navy told the authors of this report that the decision is not imminent.[98] The Germans are likely waiting to see if there are any serious problems with the Cyclone after it becomes operational in the Royal Canadian Navy.

Reassessing the SOR

The 1999 SOR becoming outdated would not be a problem had the procurement proceeded on the original timeline. However, with the Cyclone still in development and new technological options appearing all the time, the 13-year-old SOR has provided both the excuse and the opportunity for DND and Sikorsky to "make it up as they go along". As explained above, it seems the new electronics and armaments added beyond the original SOR have caused, in turn, the requirement for more powerful engines.

So what would be included in a new SOR if the exercise were to begin anew? It is a given that Canada's maritime helicopters will need to serve a variety of roles, including anti-submarine warfare; over-the-horizon surveillance; transport of personnel, equipment and supplies; and search and res-

cue. General-purpose maritime helicopters are clearly needed, rather than limited-role ones.

The key mechanical requirements need not be revisited since the basic physical challenges have not changed. Up-to-date electronic systems are clearly required, although it can be questioned whether the latest interoperable war-fighting technologies are really needed. Slightly older technologies are usually better-proven technologies, and one can therefore question whether continuing to chase the latest technology is wise.

Alternative Helicopters

The list of alternatives to the Cyclone is short. However, due to the age of the Sea King fleet and the ongoing delays and uncertainties in the development and delivery of the CH-148 Cyclone, an examination of possible options seems wise. At the least, if Canada is to have a strong and credible negotiating position vis-à-vis Sikorsky, it must have a credible alternative in view.

1. MH-60R Seahawk

In 1987, during the bidding process for Canada's search and rescue helicopters, Sikorsky considered advancing the SH-60 Seahawk but decided that it would not meet Canada's specifications.[99] The Seahawk currently serves in the U.S. Navy as the airborne platform aboard cruisers, destroyers and frigates.[100] Although the older versions of the Seahawk are now being phased out, the latest variants — the MH-60S and MH-60R — will be operational for decades.[101] If Canada were to adopt a new-version Seahawk it would enable interoperability with U.S. Navy vessels, as spare parts and experienced mechanics would be readily available.

Canada would have to opt for the MH-60R, because the MH-60S has no sensors and is primarily used for vertical replenishment, combat SAR and utility roles.

The operational radius of the Seahawk is approximately 417 km,[102] which is comparable to the Sea King and Cyclone.[103] The operational radius of the Cyclone is estimated to be 450 km.[104] "Operational radius" indicates the greatest distance the helicopter can venture before having to return to its home ship. The Seahawk has an external cargo hook capable of carrying 6,000 lbs.[105] The Cyclone has a external cargo hook capable of 10,000 lbs.[106] The Sea King's external cargo hook is capable of 5,000 lbs.[107] Of course the

MH-60R Seahawk (U.S. Navy photo by Mass Communication Specialist Seaman Brian T. Glunt)

operational radius of a helicopter and its external cargo capability decrease with every pound of fuel, personnel or equipment added.

The main drawback of adopting the Seahawk is that the design is based on Sikorsky's UH-60 Blackhawk series, which is used by the U.S. Army.[108] There is some doubt as to whether it can float for two minutes, as is required by the 1999 SOR. However, the fact that the Seahawk has been adopted by the U.S. Navy suggests this requirement may be worth revisiting. The Danish military has recently selected the Seahawk for its maritime forces.[109]

If Canada wished, it might be possible to transform the Cyclone contract into a Seahawk contract, thereby saving face and, perhaps, costs for both parties.

2. AW-101

AgustaWestland has taken over the production licence for the EH-101 Cormorant. Now designated the AW-101, it has an improved performance record since the initial production line and could be a contender for Canada's maritime helicopter project. If the AW-101 were chosen, it could

AW-101 (Photo UK Royal Navy)

bring certain cost savings related to training mechanics and aircrews, and flexibility in the stationing of search and rescue and naval helicopter fleets, as the Canadian Forces already has this helicopter in service for search and rescue.

The AW-101 has an operational range of approximately 650 km,[110] significantly greater than the 450 km for the Cyclone.[111] It can carry 10,000 lbs with its external cargo hook, which compares well to the other candidates.[112]

3. NH-90 NATO Frigate Helicopter (NFH)

The NH-90 is built by NH Industries, a company owned by Eurocopter, AgustaWestland and Fokker Aerostructures.[113] It is already in service with the navies of France, Italy and the Netherlands and has been selected by Belgium, where it has replaced both the Sea King and the Sea Lynx.[114]

The operational radius of the NH-90 is 600 km[115] and the cargo hook is capable of carrying 8,800 lbs.[116] The aircraft is made of corrosion-proof composite materials and has a useful rear ramp.[117] Like the Cyclone, the NH-90 has encountered certification and technical issues that have caused some

NH-90 NATO Frigate Helicopter (NFH) (Photo French Navy)

delay in production and delivery dates.[118] The NH-90 is currently being considered by both Germany[119] and Norway.[120]

4. Eurocopter EC-725 Super Cougar

The EC-725 Super Cougar has been in service since 2005 and has proven its versatility by operating in naval groups as well as for the French Armed Forces in Afghanistan.[121] The Super Cougar has an operational radius of 650 km[122] and a main gearbox with a dry run capability of 52 minutes.[123] The external cargo hook capacity is 10,470 lbs.[124] It has an emergency flotation rating up to Sea State 6, which is significantly better than the Sea State 3 required by Canada's 1999 SOR.[125]

A significant drawback for the Super Cougar is that its tail rotor does not fold, which would make storage more difficult onboard Canada's existing ships. The Canadian government intends to build a new fleet of Single Class Surface Combatant Ships and the necessary room could possibly be incorporated into the design of those vessels. It would be necessary to determine whether overall costs and operational capability warranted such design modifications.

Eurocopter EC-725 Super Cougar (Photo French Army)

TABLE 1 Helicopter Comparison

	SOR	CH-124 Sea King	CH-148 Cyclone	MH-60R Seahawk	AW-101	NH-90 NFH	EC-275 Super Cougar
Operational Radius (km)	≥ 370	370	450	417	650	600	650
External Cargo Hook (lbs)	≥5,000	5,000	10,000	6,000	10,000	8,800	10,470
# of Engines	N/A	2	2	2	3	2	2
Empty Weight (lbs)	N/A	14,530	15,587	13,470	23,149	14,100	12,600

Recommendations

This report is intended to provide historical context as well as suggest solutions to Canada's ongoing difficulties in obtaining new helicopters for the Canadian Navy. Based upon this analysis, three recommendations are made:

1) That the Government provide full transparency on the Maritime Helicopter Project, so that the public can judge the appropriateness of any approach to dealing with the crisis;

2) That the Government get tough with Sikorsky regarding the overdue and over-budget CH-148 Cyclone by actually imposing the late penalties, and refusing further top-up funding. Sikorsky may threaten a lawsuit, but Canada also has cards that it could and should play;

3) That the Government commence an accelerated review of off-the-shelf alternatives without further delay, so as to be in a position to negotiate a new contract with another supplier in the event of a continued failure by Sikorsky to fulfill its obligations.

It is important to note that these recommendations are mutually reinforcing. For example, identifying an alternative helicopter (recommendation 3) would strengthen Canada's position vis-à-vis Sikorsky (recommendation 2).

Conclusion

Canada's maritime helicopter crews perform essential duties on a daily basis, including search and rescue, sovereignty assertion, and reconnaissance missions that keep Canadians safe from drug trafficking and other illegal activities. The challenges involved are only exacerbated when using 50 year-old Sea King helicopters that are obsolete and unsafe. When the Defence Minister calls the replacement of maritime helicopters "the worst procurement in the history of Canada,"[126] it is time to stop the procrastination and politics — and focus on providing the right tools, quickly, for our men and women in uniform. As the government itself said in the 2008 Throne Speech: "Canada cannot afford to have cumbersome processes delay the purchase and delivery of equipment needed by our men and women in uniform."[127]

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