



5 November 2021

Mr. Geoffrey Budden
Commission Counsel
Newfoundland and Labrador Ground Search and Rescue Inquiry
c/o 5 Hallett Crescent, Unit 4
St. John's, Newfoundland, A1B 4C4

Dear Mr. Budden

Subject: Public Inquiry Respecting Ground Search and Rescue for Lost and Missing Persons

Thank you for your invitation to Leonardo Helicopters to provide the Newfoundland and Labrador Ground Search and Rescue (GSAR) Commission of Inquiry with information on the proposed upgrades to Canadian Armed Forces primary search and rescue helicopter, the AW101/CH149 "Cormorant" helicopter, referred to by the Government of Canada as the Cormorant Mid-Life Upgrade Project (CMLU).

Leonardo Helicopters is the original equipment manufacturer of the Cormorant, which entered service in Canada in 2002 and recently surpassed 100,000 hours of service in support of the Canadian Armed Forces and Royal Canadian Air Force search and rescue efforts in virtually every corner of Canada.

The proposed CMLU Project will: increase the fleet size; extend the estimated life expectancy to at least 2042; acquire training devices and infrastructure; address obsolescence; upgrade the engines; enhance aircraft flight management, communications, navigation and safety capabilities to meet current and pending airspace regulatory requirements; and improve the search and rescue sensor capabilities of the Cormorant helicopter. These objectives shall enable the Cormorant helicopter to return to Canadian Force Base Trenton and provide greater capability to the fleet, with less search more rescue.

We are pleased to provide you the following submissions:

- 1) Cormorant Mid-Life Upgrade Project backgrounder
- 2) Canada Cormorant Mid-Life Upgrade briefing presentation.

Should the Commission have any questions arising from these submissions, we would be pleased to respond at your convenience.

Thank you again for the invitation and the opportunity to provide the Commission with this information.

Yours sincerely

A handwritten signature in blue ink, appearing to read "D. Howe".

Dominic Howe
Head of Campaigns – America and Canada
Leonardo Helicopters

Leonardo Helicopters
Lysander Road
Yeovil BA20 2YB United Kingdom
Tel +44 (0)1935 475222

Leonardo UK Ltd
Registered in England & Wales No. 2426132
Registered Office: One Eagle Place, St. James's
London SW1Y 6AF

Leonardo Canada
55 Metcalfe Street Suite 540
Ottawa Ontario K1P 6L5
613-235-0353



Cormorant Mid-Life Upgrade Project Backgrounder

Canada acquired 15 Leonardo AW101/CH-149 "Cormorant" Search and Rescue (SAR) helicopters that entered service in 2002 with the Royal Canadian Air Force (RCAF) at Canadian Forces Bases (CFBs) Gander (Newfoundland), Greenwood (Halifax), Trenton (Ontario) and Comox (British Columbia).

In 2006, one of the helicopters was lost in a tragic training accident, Canada did not replace the lost aircraft and due to other operational issues, the remaining 14 aircraft were redeployed to three bases (CFBs Gander, Greenwood and Comox).

In 2011, the Canadian Government acquired the assets (nine helicopters and spares) of the cancelled VH-71 U.S. Presidential Helicopter Program, for use as spare parts for the Cormorant Search and Rescue helicopters.

In 2012, the RCAF initiated the Cormorant Mid-Life (CMLU) Project and the subsequent year, they commenced an Options Analysis to consider the upgrade path for the Cormorant which would include addressing forecast elements of technology obsolescence after a decade of service at that point.

In 2017, the CMLU Project was identified in *Strong, Secure, Engaged: Canada's Defence Strategy* as one of the Canadian Armed Forces funded capital projects.

In 2018, the Government of Canada, through Public Services and Procurement Canada, issued a Letter of Notification (LON) to Industry which defined the scope of the CMLU Project to upgrade the existing 14 helicopter fleet and augment it "by up to 7 additional aircraft." The LON stated that the government intended to move forward with Leonardo Helicopters as the Original Equipment Manufacturer and would only consider Leonardo AW101 solution for the project as "the Cormorant is the only solution to meet the Rotary Wing Search and Rescue capability requirements ... (and) the augmentation of the CH-149 fleet with a different type of helicopter is not feasible."

As per the LON, the CMLU Project will:

- Extend the life of the Cormorant helicopter until 2040 and beyond;
- Return the Cormorant fleet to CFB Trenton as the primary SAR helicopter;
- Provide enhanced aircraft flight management, communication and navigation systems, complying with latest regulations;
- Introduce modern SAR mission sensors;
- Develop a domestic training and simulation capability with a full-mission simulator and other training aids in Canada;
- Ensure there is no disruption to Cormorant Rotary-Wing SAR capability during the Project.

The CMLU Project will also address existing and projected obsolescence while incorporating maintainability and reliability enhancements.

The CMLU solution will leverage the existing design and development undertaken by Leonardo Helicopters on the latest generation of the AW101 – the Norwegian All-Weather Search and Rescue Helicopter (NAWSARH) – which is currently being delivered to Norway.



Leonardo Helicopters established “Team Cormorant” comprising Leonardo helicopters, IMP Aerospace & Defence, CAE, GE Canada and Collins Aerospace Canada, to deliver the CMLU Project with the vast majority of the work to be done in Canada primarily at IMP’s Halifax, N.S. facilities.

In 2019, then Defence Minister Harjit Sajjan reaffirmed the commitment of the Canadian Armed Forces to CMLU, which was then defined as the 14 helicopter CMLU with a fleet augmentation of at least two helicopters.

In 2020, Leonardo Helicopters received a Request for Proposal (RFP) and submitted its response. In November 2020, Leonardo Helicopters was informed that the Project had affordability challenges.

Leonardo Helicopters continues to work with the RCAF and the CMLU Project Management Office to identify a path forward for the Project.

Current Situation

The Cormorant has undertaken countless rescues across Canada since 2002, with the fleet accumulating over 100,000 flying hours for missions and training – an average of more than 7,000 hours per helicopter.

The Cormorant is now facing obsolescence issues which are impacting operational availability and is introducing a long-term risk to helicopter SAR capability. Resuming a path for CMLU is essential to Canada sustaining a robust rotary SAR capability to beyond 2040.

Potential CMLU Benefits of Impact for the Newfoundland and Labrador Ground Search and Rescue Commission of Inquiry

As per the terms of reference, the Commission has been directed to, in its final report, “review the organization and operation of ground search and rescue in the province *including air support for ground search and rescue.*”

As a provider and partner to SAR services and training around the world, Leonardo Helicopters believes the CMLU Project can contribute to improving ground search and rescue in Newfoundland and Labrador as follows:

- 1. Increased fleet size, returning to CFB Trenton:** By increasing the fleet size and returning to CFB Trenton will result in greater asset availability across Canada.
- 2. Domestic Training and Simulation:** With the addition of robust full mission simulator in Canada, fewer training hours will be flown on the Cormorants. This will increase their availability for SAR missions.
- 3. Technology and Capability Enhancements:** The CLMU Project will enable Cormorant aircrew to locate and recover persons in distress quicker, significantly increasing survivability in the harshest of conditions. In other words, less search, more rescue.



CANADIAN CORMORANT MID-LIFE UPGRADE

Newfoundland and Labrador Ground Search and Rescue (GSAR)
Commission of Inquiry

Briefing





AGENDA

- Executive Summary
- Current Situation
- CMLU Objectives
- The Solution
- Equipped for Every Eventuality
- Largest SAR Helicopter
- Best In Class Range
- Less Search More Rescue
- Capability Enhancements
- Training System
- Outcome and Benefits



EXECUTIVE SUMMARY

- Leonardo Helicopters is the original equipment manufacturer of Canada's fleet of 14x CH-149 Cormorant Search And Rescue (SAR) helicopters and the nominated prime contractor for the **Cormorant Mid Life Upgrade (CMLU)** Project
- The CMLU Project is a funded Project in **Strong, Secure, Engaged**: Canada's Defence Policy
- The CMLU Project will be delivered through **Team Cormorant**, a collaboration of Leonardo Helicopters and IMP Aerospace & Defence together with CAE, GE Canada and Collins Aerospace Canada
- The Team Cormorant solution will deliver up to **16 CMLU helicopters** (upgraded and augmented) and a **Training System in Canada**
- The CMLU Project provides significant opportunity to increase the fleet size and capability – **Less Search More Rescue**
- Canada and the Cormorant crews who operate them deserve the most capable advanced search and rescue tools to conduct their operations successfully, the lives and people that they are searching for depend on it
- The CH-149 Cormorant was and still is the **only helicopter able to meet Canada's rigorous Statement Of Requirements** – range, endurance, capacity and all weather capability.



CURRENT SITUATION

- The Cormorant helicopters are currently stationed at Canadian Forces Bases (CFB); Gander, Greenwood and Comox
- Since commencing operational service in 2002, the Cormorant has flown over 100,000 hours and performed thousands of missions saving countless lives
- Following 20 years of service, the Cormorant fleet needs to be upgraded to remove obsolescence and introduce new technologies and capabilities to reduce search times and conduct rescues faster, thereby reducing the risk of loss of life
- The Cormorant aircrew rely on the "Mark 1 eyeball" to locate persons / vehicles in distress i.e. they do not have access to an electro/optical device, surveillance radar, or other automatic / semi-automatic electronic scanning visual / radio equipment – but rely on visual clues (oil spills, trails) using their eyesight
- Additional Cormorant helicopters are required to enable the fleet to return to CFB Trenton and the Great Lakes SAR region
- Aircrew simulator training is currently performed overseas, but predominantly on front line Cormorant helicopters
- The Northwest Passage and the Arctic in general, is witnessing an increase in commercial and tourism activities bringing increased safety and security challenges that include search and rescue.



CMLU OBJECTIVES

- Extend the life expectancy of the CH-149 Cormorant to 2042 and beyond
- Address current and projected obsolescence issues
- Enhance aircraft flight management, communications, navigation and safety capabilities to meet current and pending airspace regulatory requirements
- Introduce improved sensor capability enhancing on-scene search effectiveness
- Upgrade communication systems to improve interoperability with other SAR assets such as the fixed wing aircraft, the Joint Rescue Coordination Centres and civilian SAR
- Improve aircrew training effectiveness, through provision of a full mission simulator, a dedicated training facility and CMLU training devices
- Address a rotary wing SAR capability deficiency at the CFB Trenton.

The CMLU Project will fully meet these objectives without any interruption to Cormorant SAR posture during the contract execution.



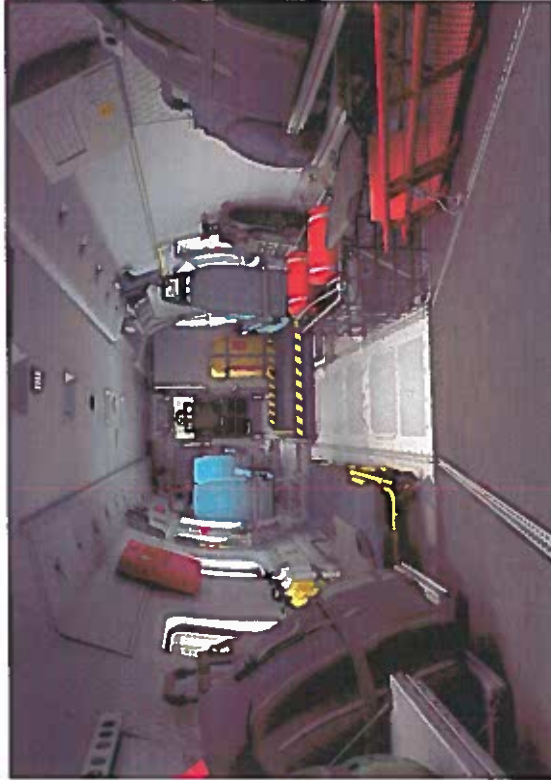


THE SOLUTION

- At least two additional Cormorant helicopters, at the same configuration standard, to enable the return of the Cormorant SAR capability to CFB Trenton and the Great Lakes SAR Region
- The additional helicopters will enable the CMLU Project to be undertaken against a low risk transition plan without interruption to existing Cormorant coverage
- Utilizing an existing designed and implemented solution that benefits from 20 years of evolution and capability enhancement – enabling an affordable, low risk and proven solution
- The CMLU Project assures the continued airworthiness and mission effectiveness through the resolution of obsolescence, introduction of latest generation technology
- The CMLU Project will, subject to the selection of options, introduce enhanced modern sensors including: Electro-Optical Infra-Red (EO/IR) device, 360° Active Electronically Scanned Array (AESA) surveillance radar and mobile phone detection localization system
- The CMLU Project presents an opportunity to provide a reduction in maintenance and improved reliability of equipment
- The full mission simulator and associated training devices, located in a dedicated training facility in Comox, will reduce the training burden on front line Cormorant helicopters.



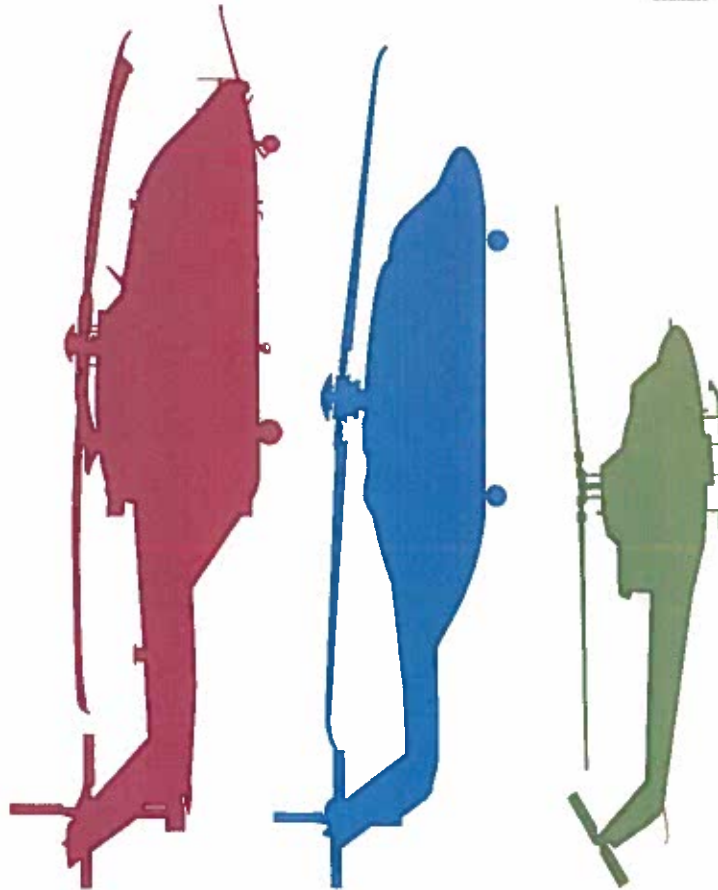
EQUIPPED FOR EVERY EVENTUALITY





LARGEST SAR HELICOPTER

The Cormorant has 39% more cabin volume than the S92 and over 400% more than the Bell 412 (RCAF Griffon helicopter):



Leonardo CH-149 Cormorant

Sikorsky S-92

Bell 412 (Griffon helicopter)

With five underfloor fuel tanks, the Cormorant has the capacity to carry all necessary SAR equipment in the cabin.



BEST IN CLASS RANGE

With complete crew composition, fully equipped with Search and Rescue equipment, the CMLU helicopter is the only helicopter able to meet Canada's rigorous Statement Of Requirements:



550NM of range:

- SAR Load of 2,600lbs.
 - 5 crew + personal equipment
 - Rescue and survival gear
- VFR fuel reserves
- Temperature = ISA+15
- No auxiliary tank

Range circles overlaid onto the globe



LESS SEARCH MORE RESCUE

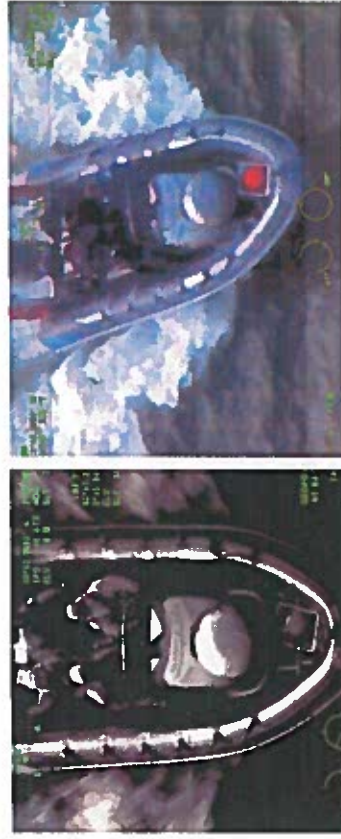
- CMLU Mission Sensor capability enhancements:

Electro-Optical Infra-Red (EO/IR) Device

The EO/IR device provides the ability to detect objects/people in distress, day or night. It can be linked to selected peripheral equipment, e.g. radar and high intensity searchlight, which enables pointing capabilities. The system improves capability and efficiency of the visual search capability, especially in reduced visibility situations, with infra-red thermal imaging.



Images demonstrating increasing detail and recognition of target information through increasing zoom scales



Textual information purposefully blurred to protect third parties.



LESS SEARCH MORE RESCUE

- CMLU Mission Sensor capability enhancements:

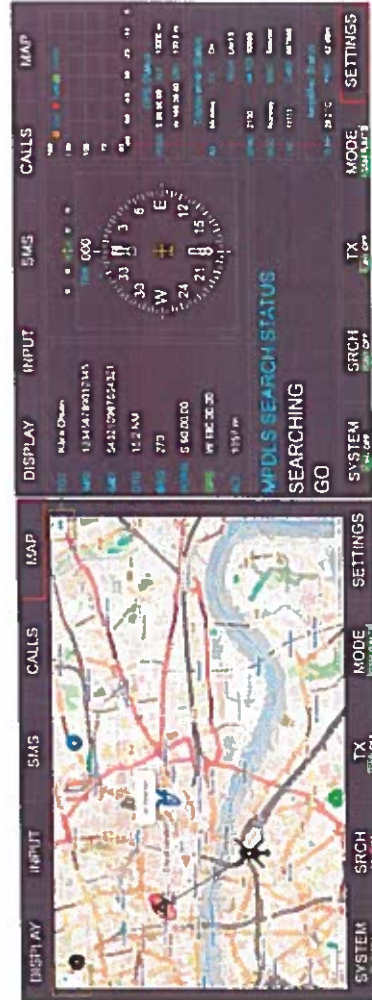
Mobile Phone Detection and Localization System (MPDLS)

The operationally proven MPDLS utilizes cellular telephone system communication protocols to detect and localize a cell phone of an individual in distress at substantial range, significantly reducing search times.

The MPDLS is more effective in remote locations where limited / no cell coverage exists and has become the primary search sensor with enabled SAR operators. This enables crews to locate persons in distress and communicate with them by voice or text.

User testimonial:

MPDLS is the most important new sensor capability provided with the AW101. It enables us to detect and localize the cell phone of a person who is lost and/or in distress up in the mountains or at sea. If the person is in a remote location where there's no cell phone network coverage, the MPDLS unit installed in the AW101 assumes the role as a base station and provides for the required GPS triangulation whereby a network becomes available to call or text the cell phone of the lost person.



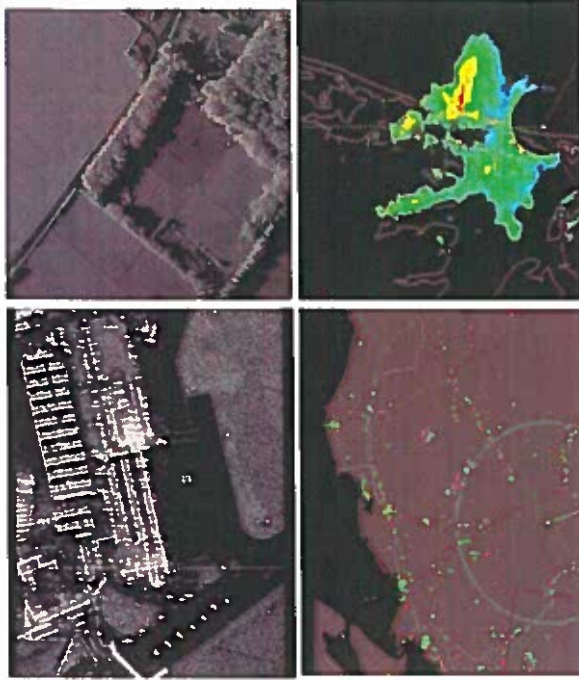


LESS SEARCH MORE RESCUE

- CMLU Mission Sensor capability enhancements:

360° AESA Surveillance Radar

The surveillance radar utilizes an active electronically scanned array to deliver large area, long range surface search with small target mode and moving target detection. The system provides unrivalled high resolution surveillance for intelligence gathering, helping to detect, identify and track: slow moving objects; hard to see small objects masked by different terrains; targets hidden by adverse weather conditions. The system has interleaved scan and imaging capability. In order to confirm the area of interest, radar detections can be further investigated with the EO/IR.





CAPABILITY ENHANCEMENTS

- Resolution of obsolescence and introduction of capability enhancements:

Aircraft Management System (AMS) and Flight Management System

Latest standard of AW101 AMS together with multi-purpose control display units provides coupled instrument flight rules navigation and improved data management and selection.

Cockpit Display System

Full Night Vision Goggle compatible, large format cockpit display system enables the presentation of flight plans, digital maps, terrain data, synthetic vision, helicopter terrain avoidance warning system and video presentation of mission sensors, including electro-optical infra-red device, surveillance radar, and external cameras and sharing of information to the sensor workstation operator.



Exhibit P-207

Upgraded Automatic Flight Control System (AFCS)

Four-axis digital dual-duplex AFCS providing improvements to autopilot and stabilization capabilities, reducing crew workload and improved safety especially during low altitude operations in degraded visual conditions. The AFCS operates with the flight management system to provide a Mark on Top automatic circuit to hover, GPS based approach capability and inertial sensor based hover modes for mountain flying and fully coupled search modes.

GE CT7-8E Turboshaft Engine

CT7-8E, 2,500 SHP engine, derived from the proven CT7-8 engine, will provide increased power and includes a full authority digital electronic control system providing engine self management, reducing crew workload.

Company Confidential



TRAINING SYSTEM



• The CMLU Project includes an in-country training capability:

- A full mission simulator (Level D)
- A rear crew trainer
- Training media/equipment
- A dedicated training centre in Comox B.C.

• The Training System will:

- Remove the necessity for Royal Canadian Air Force personnel to travel overseas for simulator training
- Reduce the training burden on front line Cormorant helicopters through the use of synthetic devices.





OUTCOME AND BENEFITS

- The CMLU Project presents the lowest risk, most cost effective solution to optimize the Cormorant capability and will result in the following outcomes/benefits:

| OUTCOME / BENEFITS | AW101 |
|--|-------|
| An updated fleet with common equipment to address obsolescence issues | ✓ |
| Increased numbers of Cormorant helicopters throughout Canada to allow the return of Cormorant SAR capability to CFB Trenton and the Great Lakes SAR Region | ✓ |
| Provides Canada with sufficient medium to heavy lift rotary wing capacity to provide support to the increasing Northern activities and respond to international crises without impacting national SAR responsibilities | ✓ |
| An opportunity for a reduction to the current CH-149 cost of ownership | ✓ |
| A low risk commercial off the shelf upgrade solution from both a schedule and financial perspective | ✓ |
| Continued, uninterrupted CH-149 Cormorant SAR coverage during the CMLU Project implementation | ✓ |
| Incorporation of new technology and product improvements that increase reliability, capability, safety and availability, while reducing the cost of maintenance | ✓ |
| Compliance to existing and emerging airspace regulations | ✓ |
| Sustaining a rotary wing SAR capability until 2042 and beyond | ✓ |
| Significant Industrial and Technological Benefits and Value Proposition realized through innovation and long term product relationships with Canadian industry | ✓ |



HELICOPTERS DIVISION

THANK YOU



Comptel Confidential