

NATO Project NGRC Association of Old Crows Europe Electronic Warfare 2021 12 October 2021

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- The importance of Rotorcraft in past and current military operations is widely recognized and predicted to endure.
- The threat is constantly evolving and places the NATO Rotorcraft fleet at risk of capability overmatch.
- Large numbers of Medium Rotorcraft will reach the end of their programmed life between 2030 – 2055.
- The current state of technology is such that significantly enhanced capability is now achievable.
- Traditionally, Rotorcraft take an extended time to develop, typically 20 years between Pre-Concept and In-Service phases.
- The capability/requirements process is currently underway with the project transitioning to Concept phase in 2022.



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Background to Requirement

- Large numbers of the NATO Medium Rotorcraft fleet will be nearing the end of their service life in the period 2030 2055.
- Analysis suggests a long-term enduring requirement for the capability currently provided by Rotorcraft.
- Analysis of open-source long term Rotorcraft fleet plans for NATO nations (excluding US) suggests a large number will be retired in the coming decades:
 - Mil 8/17 100 helicopters, OSD 2030-35
 - Puma 191 helicopters, OSD 2025-40
 - S-70/UH-60 167 helicopters, OSD 2030-40
 - AW.101 143 helicopters, OSD 2035-50
 - NH90 331 helicopters, OSD 2040-55
- Total: 932 by 2045

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Medium Rotorcraft First Flight Dates



SA.330H-60EH.101V-22NH9019651974198719891995



- It is estimated that for traditional procurement models it takes at least 20 years from project inception to entry into service.
- Multinational projects are likely to take longer than single nation ones but offer benefits in terms of (for example) interoperability.
- Using NH90 as an example:
 - NIAG Sub-Groups
 - Pre-Feasibility Study
 - Feasibility & Pre-Definition Study
 - Development Contract Signed
 - First Flight
 - First Aircraft Deliveries

 1981

 1983

 1983

 1985

 1992

 1995

 2006



NATO Initial Activities

- 2012: Science & Technology Organisation's Applied Vehicle Technology panel established a task group to look into Future Rotorcraft Requirements with a nominal IOC in the 2040s.
- 2015: Future Rotorcraft Requirements workshop in Prague.
- 2016: Joint Capability Group Vertical Lift sponsored the formation of the Next Generation Rotorcraft Capabilities Team of Experts (NGRC TOE) to develop strategy for a Next Generation Rotorcraft.
- NGRC TOE engaged with multiple NATO bodies including:
 - Science & Technology Organisation (STO)
 - NATO Industrial Advisory Group (NIAG)
 - Allied Command Transformation (ACT)
 - Joint Air Power Competence Centre (JAPCC)



NGRC TOE Report

- 2018: NGRC TOE Reported to JCG VL and NAAG. The report considered the findings from supporting studies and the projected future operating environment and concluded that:
 - The Next Generation Rotorcraft should be designed modular, to enable nations to procure those capabilities they require.
 - Modularity can reduce Life Cycle Costs, enhance Interoperability and Sustainability.
 - Identified 8 Key Enabling Technologies that should be prioritized to meet TRL8 for a postulated NGRC from 2035.
- 2018: JCGVL endorsed the recommendations and supported the establishment of Project NGRC to take them to the next stage.
- 2019: UK agreed to lead Project NGRC pre-concept stage for a Next Generation Medium Multi Role Rotorcraft.

Key Enabling Technologies

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Key Enabling Technologies

- Survivability
 - Multi-Spectrum Signature Control
 - Defensive Aids Systems
 - Sensors
 - Effectors
 - Hard Kill
 - Adoption of STANAG 4781 (NATO Defensive Aids Systems)
 - Vulnerability Reduction
 - Crashworthiness
- Lethality
 - Directed Energy Weapons



- Avionics & Mission Equipment
 - Modular Open System Architectures
 - Reconfigurable Mission Systems
 - Multi-vehicle & multi-sensor fusion
 - Flight in Degraded Visual Environments
 - Precision Navigation & Timing Systems
- Human Factors
 - Sensory Cueing Augmented Reality, 3D audio
- Teaming

Optionally/Optimally Manned Rotorcraft (crew of 2, 1 or 0)

> Teaming Interoperability, Communication Technologies



Project NGRC

- Apr 2019: Project Mandate distributed within NATO.
- Sep 2019: Kick off meeting (at DSEI).
- Nov 2019: Discussions with NATO Multinational Capability Cooperation Unit (MCCU) and NATO Support & Procurement Agency (NSPA) commenced.
- Oct 2020: NGRC Identified as a NATO High Visibility Project.
- Oct 2020: Letter of Intent for Pre-Concept stage signed by Defence Ministers from France, Germany, Greece, Italy and UK.
- Jan 2021: MoU for Concept Stage Development commenced.
- Mar 2021: Statement of Requirements and Timelines finalized.
- Sep 2021: Industry Event at NSPA.
- Mid 2022: MoU signed transition to (3 year) Concept Stage.

NATO OTAN NGRC Required Attributes

- Modular Open Systems Approach (MOSA)
 - Inclusive of the digital backbone
 - AI aided multi-sensor fusion
 - Compliant with STANAG 4781 (NDAS)
- Ability to act as an optionally crewed/remotely piloted vehicle.
- Manoeuvrability & Agility: Level 1 Handling Qualities
- Maximum All Up Mass of 17T.
- Internal cabin dimensions of at least 2m x 1.6m x 5m.
- Unrefuelled range of greater than 900nm.
- Cruise airspeed in mission configuration:
 - Target: 220 Kts +, Threshold: Not less than 180 Kts.
- <u>https://eportal.nspa.nato.int/eProcurement/FBO/eProcurementFBODe</u> <u>tails.aspx?OpportunityId=21LAM007</u>



- The importance of Rotorcraft in past and current military operations is widely recognized.
- The current state of technology is such that significantly enhanced capability is now achievable.
- Significant numbers of NATO Rotorcraft will reach the end of their programmed life between 2035 and 2055 and will need to be replaced.
- Traditionally, Rotorcraft take approximately 20 years from the pre-concept stage to entry into service.
- NATO sponsored activities are ongoing aimed at initiating a development programme for a Next Generation Medium Multi-Role Rotorcraft with initial service entry in the mid/late 2030s.



Thank You for Your Attention!

