

# Integrity Improvement of Rotorcraft Main Gear Box (MGB)



## Contractor

Airbus Helicopters Technik GmbH  
(former ZF Luftfahrttechnik GmbH)

## Consortium Members

None

## Contract period

16/06/2020 - 15/03/2024

## Budget

1 700 000 €

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## Main objectives

**The main objective** of this research project has been to determine ways of improving the integrity of rotorcraft gearboxes. There have been two primary work streams to be carried out as part of this research project:

**Stream 1:** The project should evaluate Rotor and Rotor Drive System configurations and determine system architecture and design means to prevent single points of catastrophic failure, wherever possible. This shall be accomplished by means of a review of typical rotorcraft gearbox configurations and development of proposals for improvements based on the knowledge and experience of the organisation conducting the research.

**Stream 2:** The project should identify the most significant design parameters that influence the reliability and tolerance to flaws of case-hardened materials subject to rolling contact fatigue. Based on the outcome of this activity, conduct rolling contact fatigue tests and simulations with the objective of:

- Proposing limitations for these design parameters that provide an acceptable level of reliability without crack initiation or without catastrophic cracking developing when the component is subject to specific flaws;
- Identifying probable threats or flaws that cannot reliably be addressed by the proposed design parameters and that have the potential for crack initiation and subsequent propagation;
- Determining the factors that promote crack development back to the surface rather than into the core of a case-hardened component.

## Impacts & benefits

The outcomes of each stream of this research project shall:

**Stream 1:** Identify Rotor and Rotor Drive System architecture concepts and design solutions that may help reduce the exposure to catastrophic failure modes.

**Stream 2:** Support the determination of adequate means of analysis and testing to ensure that acceptable levels of reliability and tolerance to flaws in rotors and rotor drive system components are demonstrated at the time of certification.

