European Union Aviation Safety Agency

Safety Information Bulletin

Airworthiness

SIB No.: 2019-10

Issued: 22 August 2019

Subject: Power Turbine Over-Speed Protection on ARRIEL 2D Engines

Ref. Publications:

Airbus Helicopters (AH) Service Bulletin (SB) EC130-76-006 dated 01 July 2019 and
SB AS350-76.00.23 dated 18 July 2019.
SAFRAN Helicopter Engines (SAFRAN) SB 292-73-2210 dated 10 May 2019.

Applicability:

AS 350 B3 and EC 130 T2 helicopters equipped with ARRIEL 2D engine.

Description:

The power turbines (PT) of all SAFRAN ARRIEL 2 series engines are protected from the hazardous effects of over-speed (e.g. turbine disc burst) by the design principle of blade shedding. Once a certain rotational speed (N2) is reached, the PT blades are released and the PT disc has no more driving power. The ability of the ARRIEL 2D PT blade shedding to prevent turbine disc burst, and full containment of the blade debris, has been demonstrated by test to be in compliance with the applicable engine requirements. The helicopter design is also adapted to accommodate this behaviour in case of an impact accident. Therefore, the blade shedding could also occur following a main rotor tip strike leading to transmission system failure and loss of loading on the engine output shaft.

In the particular case of an accident, some specific threats can be observed. If conditions are such that flammable fluids or flammable materials are released or exposed in combination with a sufficient thermal source, a potential risk of post impact fire may exist. Sometimes, during blade shedding, extra thermal energy is released from the engine. Along with other thermal sources existing in a helicopter, this extra thermal energy is a potential source of ignition.

The ignition source has not always been clearly determined for every previous occurrence of post-impact fire. However, AH and SAFRAN have joined efforts to study some ways to reduce the unwanted blade shedding occurrences on rotorcraft equipped with ARRIEL 2D engines and hence reduce the potential for post-impact fire. The result of this effort is the implementation of an electronic over-speed protection that, if still operational after the impact, has the aim to limit occurrence of PT blade shedding by early detection of the over-speed condition and subsequent rapid fuel flow shut off. This new function is introduced through a Full Authority Digital Engine Control (FADEC) software modification and a wiring modification at helicopter level.

Table 1 of this SIB provides a list of modifications approved by EASA and the associated SBs as available at the issue date of this SIB.

Table 1 – Approved Modifications / Service Bulletins

Modification / Approval Reference	SB Reference
Modification 074831 EASA Approval 10066998	Airbus Helicopters • SB EC130-76-006 • SB AS350-76.00.23
Modification DM 116271 EASA Approval 10065664	SAFRAN SB 292-73-2210

At this time, the safety concern described in this SIB is not considered to be an unsafe condition that would warrant Airworthiness Directive (AD) action under Regulation (EU) 748/2012, Part 21.A.3B.

EASA is, however, reviewing the accident data and further recommendation and/or AD action may follow.

Recommendation(s):

EASA recommends operators to modify the affected helicopters by incorporating the applicable engine and helicopter modifications.

Contact(s):

For further information contact the EASA Programming and Continued Airworthiness Information Section, Certification Directorate, E-mail: ADs@easa.europa.eu.

For any question concerning the technical content of this SIB, please contact:

Airbus Helicopters – Aéroport de Marseille Provence, 13725 Marignane Cedex, France,
Telephone: +33 (4) 42 85 97 97, Fax: +33 (4) 42 85 99 66,
E-mail: support.technical-engine-st.ah@airbus.com,
Web portal: https://keycopter.airbushelicopters.com - Technical Requests Management;

or your nearest SAFRAN Helicopter Engines technical representative, or connect to www.tools.safran-helicopter-engines.com.