

Safety Information Bulletin

Airworthiness – Operations

SIB No.: 2025-06R1**Issued: 01 October 2026**

Subject: **Potential Risk Management Issue after Engine Load Reduction Device Activation**

Revision:

This SIB revises EASA SIB 2025-06 dated 18 July 2025.

Ref. Publications:

- National Transportation Safety Board (NTSB) Docket No. [DCA24LA330](#).

Applicability:

Operators of aeroplanes powered by CFM International LEAP engines.

Description:

The Boeing 737 Max aeroplanes and certain models of the Airbus A320 NEO family aeroplanes are powered respectively by the CFM International LEAP-1B and LEAP-1A engines, which are equipped with a Load Reduction Device (LRD). The LRD is a mechanical device that fuses to reduce the loads transmitted to the engine structure and the aeroplane during high fan unbalance events. The LRD is designed to activate at a given load; it is not a system that is controlled by the flight crew.

When the LRD is triggered (based on specific load thresholds), an oil leakage path is created, which allows leakage of both, oil from the sump and oil from the oil supply tubes, into the primary flow path. This releases oil into the core compressor upstream of the aircraft bleed ports contaminating the bleed air delivered to the Environmental Control System (ECS). This air is further distributed to the cabin and/or flight deck.

Two serious incidents involving LRD activation after engine bird strike, followed by propagation of oil into the ECS, occurred in the Boeing 737 Max aeroplanes powered by CFM LEAP-1B:

- First event: On 05 March 2023, a Boeing 737-8 aeroplane experienced a right engine bird strike after take-off and subsequent commanded in-flight shutdown (IFSD). The flight crew declared an emergency and returned to the airport, safely landing the aeroplane. The flight attendants reported heavy smoke in the cabin.
- Second event: On 20 December 2023, a Boeing 737-8 aeroplane experienced a left engine bird strike after take-off and subsequent IFSD. The flight crew declared an emergency and returned to the airport, safely landing the aeroplane. Pilots reported heavy smoke in the flight deck and donned oxygen masks. According to Federal Aviation Administration information, the smoke dissipated in approximately three minutes (based on NTSB Docket No. DCA24LA330, the smoke began to dissipate rapidly after the First Officer pulled the engine fire switch as directed by the Quick Reference Card). The investigation of this incident is closed.

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One serious incident involving LRD activation after bird strike, followed by propagation of oil into the ECS, occurred in the Airbus A320 Neo family powered by CFM LEAP-1A:

- On 3 August 2025, an Airbus A321 Neo experienced a bird strike on the aircraft radome during climb (6 400 ft) and debris from the bird and the aircraft radome were ingested by the left engine. The aircraft's interior filled with white smoke. The flight crew returned to the departure airport where the aeroplane landed safely. The investigation of this incident is still ongoing.

To date, the investigations have identified the following potential hazards in the event of LRD activation and subsequent oil release into the aircraft ECS system:

- Smoke or fumes may develop in the flight deck at a concentration that can reduce vision and cause discomfort, which could lead to flight crew diminished operational performance in an already high-workload situation, including possible crew incapacitation, potentially affecting the safety of the aeroplane or its occupants.
- Smoke or fumes may develop in the cabin or flight deck, potentially causing personal injury to passengers or crew members.

In nominal configuration, the bleed air delivered to the flight deck is mainly taken from the left engine, while the bleed air delivered to the cabin is taken from both engines. Therefore, the smoke which can be generated after an LRD activation will be released either in the flight deck and cabin, or in the cabin only, depending on the affected engine.

It should be noted that ECS architecture differs between the Boeing 737 Max and Airbus A320 NEO family aeroplanes. Above nominal configuration description refers only to the source of fresh air (bleed air) for the cockpit and the cabin supply and identifies the occupied compartments affected by smoke/fume ingress versus the affected engine sides.

The duration of the smoke event following LRD activation depends on the time taken for the affected engine to be shut down or the affected engine bleed system to be isolated. When the affected engine speed falls below a given core speed threshold (for instance, when engine automatically shuts down) the engine bleed will automatically be isolated through the closure of the corresponding ECS valve without any crew action, and the smoke release will be stopped. If, however, the affected engine core speed does not immediately fall below the given threshold (i.e. the engine continues to operate), the engine bleed will not be automatically isolated, and the isolation will depend on the application of the appropriate procedures by the flight crew. In this latter case, where engine bleed is not automatically isolated, it is crucial that the flight crew promptly applies the corresponding procedures that result in an engine shutdown, or a commanded isolation of the ECS bleed from the affected engine.

In the Boeing 737 Max aeroplanes, with the application of the Quick Reference Handbook (QRH) "Engine Fire or Engine Severe Damage or Separation" and the "Smoke, Fire or Fumes" actions the pilots can isolate the affected engine which will mitigate the smoke contamination. As a

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precautionary measure, Boeing issued a Flight Crew Operations Manual (FCOM) Bulletin to direct pilots to the engine fire or severe damage checklist first when engine problems/failure and smoke appear simultaneously. Boeing has also updated the QRH to incorporate this recommendation.

In the Airbus A320 NEO family aeroplanes, with the application of the QRH “ENG (x) FAIL”, “ENG(x) STALL”, “ENG(x) OIL LO PR” and the SMOKE/FUMES/AVNCS SMOKE procedures, with or without ECAM activation, the pilots can secure the affected engine and mitigate the smoke contamination following LRD activation.

As a precautionary measure, Airbus has introduced a memory item in the QRH procedure in case of smoke after an engine malfunction (e.g. stall, high vibrations, abnormal indications or failure) to promote the prompt isolation of the LRD smoke source. This memory item involves the pilot switching off the air conditioning pack on the side of the affected engine just after the oxygen masks are donned by the flight crew. This procedure was also updated in the FCOM and the Aircraft Flight Manual (AFM) (refer to AFM Temporary Revision D-AFM-TR796).

An additional mitigation measure is available using a pack-off take-off procedure, which is part of the standard operating or supplementary procedures for normal take-off of the Boeing 737 Max and Airbus A320 NEO family fleets.

This performance-enhancing take-off technique involves manually switching off the air-conditioning packs or manually isolating them from the Engine/Auxiliary Power Unit (APU) bleed air supply, prior to the take-off phase. The packs are then manually reactivated immediately after take-off to restore air-conditioning and cabin pressurization functions.

Applying this procedure prevents smoke from entering the cockpit or cabin in the event of an LRD activation occurring during or shortly after take-off, as the air-conditioning packs are not supplied with bleed air during the critical take-off phase, until the packs are manually reactivated.

The pack-off take-off procedure depends on the aircraft type, as an example, the Boeing 737 Max procedure “Unpressurized Take-off” closes the Engine/APU bleed air valves while the Airbus A320 NEO procedure “Take-off performed with Packs-off” closes the Pack valves. The corresponding procedure is in the flight manuals with associated flight crew indications and alerts.

This SIB is an interim measure pending the introduction of a final fix and has been revised to reflect additional safety information gathered since its original issue, including new occurrences and updated mitigation measures. CFM is developing an engine software change for the LEAP-1A and LEAP-1B engines that will detect an LRD activation event, isolate the bleed air extraction from the affected engine through the corresponding ECS valve closure without crew action and prevent smoke propagation to the ECS system.

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 Commission Regulation (EU) No [748/2012](#), Part 21.A.3B, nor it would warrant the issuance of a Safety Directive (SD) under Commission Regulation (EU) No [965/2012](#), Annex II, ARO.GEN.135.

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Recommendation(s):

EASA recommends that aircraft operators:

- Provide their flight crew members with an identification of which aeroplanes in their fleet are equipped with CFM LEAP engines that include an LRD.
- In the event of severe engine damage or engine high vibrations on aeroplanes fitted with CFM LEAP engines, ensure the flight crews are prepared for a possible LRD activation and consequent dense smoke in the cockpit.
- Emphasise the above scenario during flight crew conversion and recurrent training, to ensure that pilots are aware of the challenges of an LRD event, LRD activation consequences on aeroplanes fitted with CFM LEAP engines, and familiar with the procedures and memory items allowing to secure the affected engine and promptly isolate the smoke source.
- Verify with the aeroplane manufacturer the principle and the conditions to perform pack-off take-off procedure, as defined in the applicable flight manuals.

Contact(s):

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