Proposed Equivalent Safety Finding to CS 29.1203(d): Fire detection electrical circuit testability in flight

Applicable to EC 175B

The EC175B is a 7 tons class rotorcraft powered by 2 turbine engines P&W PT6C-67E and with a passenger seating capacity of 16. It shall be certified under the CS29 requirements applicable to Category A.

The CS29.1203d requires: "…means to allow crew members to check, in flight, the functioning of each fire detector system electrical circuit."

The EC175B does not include such a means of checking in flight; the engine compartment fire detectors have their electrical circuit tested during the pre-flight test, and the system design is such to ensure that - even with a subsequent undetected failure of the engine fire detector system during one flight - the probability of an undetected engine fire, is Extremely Improbable.

CS29.1203d derives from FAR 29.1203d requirement, more precisely from CAR 7 §7.485(c) dated 1st of August 1956. While the initial scope of this rule could not be documented, one could reasonably interpret it as to allow crew members to perform a test – in flight - in order to minimize as much as possible the risk of undetected fire due to a fire detector system electrical circuit failure. This interpretation would be confirmed by AC29-2C: "The detector system should be designed for highest reliability to detect a fire and not to give a false alarm." and "If the probability of the fire detection system experiencing a false indication cannot be shown to be improbable, a secondary means of determining the validity of the fire indication should be provided."

Even though the scope of the existing requirement is supported, the possibility to perform a check in flight does not seem necessary, given the EC175B design; it is worth to note that known existing products which are in compliance with this rule do not in fact provide procedures in the flight manuals for such in flight check.

Considering all the above, Eurocopter is of the opinion that the current design provides at least an equivalent safety to the demonstration of compliance with CS 29.1203(d).

EASA concur with the Eurocopter position