

Proposed Equivalent Safety Finding for Power boost and power-operated control system CS27.695 (a)(1)

Applicable to Robinson R66

Introductory note:

The hereby presented Equivalent Safety Finding has been classified as important and as such shall be subject to public consultation, in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) of which states:

"2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."

Statement of issue

CS 27.695 (a)(1) requires that if a power boost or power-operated control system is used, an alternate system must be immediately available that allows continued safe flight and landing in the event of any single failure in the power portion of the system.

The Robinson R66 is a new single engine Small Rotorcraft with 5 seats that includes hydraulically boosted main rotor flight controls with a mechanical back-up in case of e.g. a hydraulic pressure failure.

The R66 hydraulic servos of the flight controls incorporate a control valve design which does not provide a conventional solution for alternate means of control in the event of a single failure of that valve.

The FAA has approved an Equivalent Level of Safety finding to 14 CFR § 27.695(a)(1), Power boost and power-operated control systems, as documented in FAA ELOS Memo AT14992LA-R-S-1.

14 CFR § 27.695(a)(1) is equivalent to CS 27.695 (a)(1).

Robinson R66 – Equivalent Safety Finding D-01 - Power boost and power-operated control system

Applicant Proposal:

In order to demonstrate an equivalent level of safety with CS27.695(a)(1) at Amendment 2, Robinson Helicopter Company will provide a compensating design feature. The compensating design feature is a control valve design that averts all applicable jamming modes. Applicable jamming modes are those that conventional control valve designs meeting the requirements of §27.695(a)(1) are able to overcome and allow continued safe flight and landing.

Applicant equivalent safety demonstration:

The failure modes of the control valve design and their effect on the aircraft operations throughout various conditions will be evaluated. Robinson Helicopter Company will demonstrate by testing that the design features provide an equivalent level of safety to the level intended by the certification specification.