EASA European Union Aviation Safety Agency	**Consultation paper** **Special Condition**	Doc. No. : CPTS-0000418 Issue : 1 Date : 23 September 2024 Proposed ☒ Final ☐ Deadline for comments: 15 Oct 2024

SUBJECT	:	Propeller speed and pitch controls
REQUIREMENTS incl. Amdt.	:	CS 25.1149 at Amdt. 27
ASSOCIATED IM/MoC	:	Yes☐ / No ☒ *[Delete last page of associated IM/MoC if not applicable]*
ADVISORY MATERIAL	:	

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INTRODUCTORY NOTE:

The following Special Condition (SC) 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.) 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.*"

ABBREVIATIONS:

CAR	Civil Aviation Regulations
CFR	Code of Federal Regulations (FAA)
CS	Certification Specifications

IDENTIFICATION OF ISSUE:

EASA received an application for a major design change on a CS 25 twin turboprop powered aircraft. The proposed design change incorporates a single lever per engine dedicated to power control, with full automation of the propeller speed and pitch controls. It is considered that the applicable CS 25.1149 "*Propeller speed and pitch controls*" at amendment level 27 does not contain adequate or appropriate safety standards for such "novel or unusual design features" of the throttle quadrant.

The CS 25.1149 "*Propeller speed and pitch controls*" states:

(a) There must be a separate propeller speed and pitch control for each propeller.

(b) The controls must be grouped and arranged to allow –

(1) Separate control of each propeller; and

(2) Simultaneous control of all propellers.

(c) The controls must allow synchronisation of all propellers.

(d) The propeller speed and pitch controls must be to the right of, and at least 25 mm (one inch) below, the pilot's throttle controls.

The paragraph CS 25.1149 is harmonized with FAA's paragraph 25.1149 of 14 CFR Part 25 Initial Issue, which itself is derived from the older paragraph 4b.474 of CAR 4b. The intent of this paragraph was to provide requirements for propeller speed and pitch control in the context of early generation transport airplanes powered by piston or turboprop engines.

Due to the progress of electronics, the modern cockpit designs generally intend to maximize automation to reduce flight crew workload. In this context, some applicants have proposed throttle quadrant layout featuring a single lever per engine dedicated to power control, with full automation of the propeller speed and pitch control.

Such throttle quadrant layout cannot be demonstrated as compliant with the paragraph 25.1149, which have led the Agency to accept Equivalent Safety Findings in the past.

It is acknowledged that the current provisions of CS 25.1149 are outdated for recent and future throttle quadrant design for turboprop powered aeroplanes. This may lead the applicants to propose partially compliant, “in-between” designs which may not take full credit of the available technologies and reduce their safety benefit.

This Special Condition intends to provide new requirements for propeller speed and pitch control.

Considering all the above, the following Special Condition is proposed.

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Special Condition

Propeller speed and pitch controls

1. APPLICABILITY

This SC is applicable to CS 25 Large Aeroplanes powered by turboprop engines and incorporating a single lever per engine dedicated to power control, with full automatic control of the propeller speed and pitch.

2. SPECIAL CONDITION

The content of the CS 25.1149 "Propeller speed and pitch controls" is replaced by this Special Condition as follows to include additional requirements specific for automatic control of propeller speed and pitch:

(a) For manual control of propeller speed and pitch:

(1) There must be a separate propeller speed and pitch control for each propeller.

(2) The controls must be grouped and arranged to allow –

(i) Separate control of each propeller; and

(ii) Simultaneous control of all propellers.

(3) The controls must allow synchronisation of all propellers.

(4) The propeller speed and pitch controls must be to the right of, and at least 25 mm (one inch) below, the pilot's throttle controls.

(b) For automatic control of propeller speed and pitch:

(1) The automatic function must:

(i) control each propeller separately; and

(ii) allow synchronization of all propellers.

(2) There must be a means for the flight crew to check that the automatic control status.

(3) Any controls affecting the automatic function of propeller speed and pitch must have a means to prevent inadvertent disconnection.

(4) If controls are provided for a reversion to manual control of the propeller speed and pitch, these controls must comply with sub-paragraph (a)(1), (a)(2) and (a)(3) of this paragraph.