EASA
European Union Aviation Safety Agency

CIVP

Continued Integrity Verification Programme

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1. Why CIVP? (1/2)

CS-27/29.602: AC 27-1B (AC 27.602 § 27.602 CRITICAL PARTS) and AC 29-2C (AC 29.602 § 29.602 CRITICAL PARTS) state that:

> The objective of identifying critical parts is to ensure that critical parts are controlled during design, manufacture, and throughout their service life so that the risk of failure in service is minimized by ensuring that the critical parts maintain the critical characteristics on which certification is based.

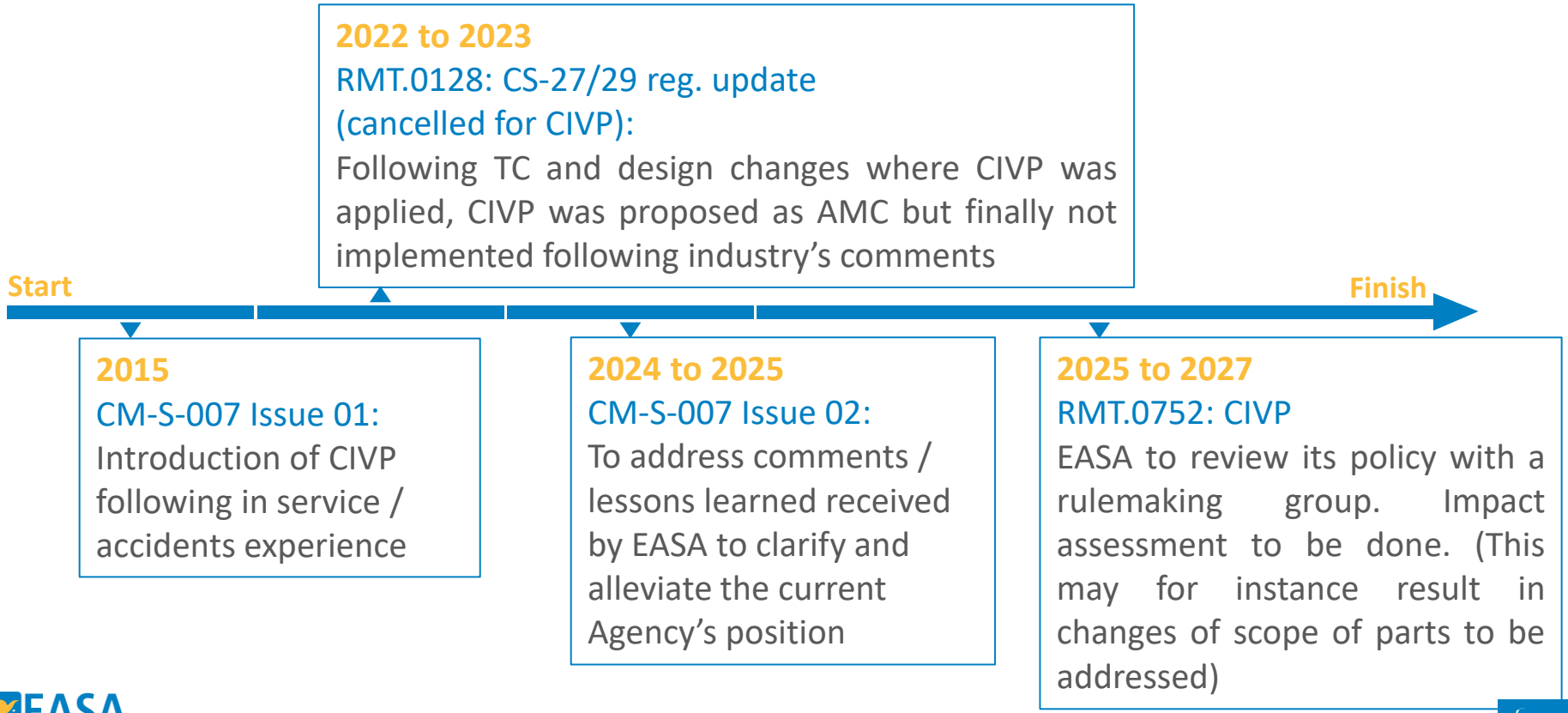
1. Why CIVP? (2/2)

Safety recommendations: Following accidents on rotorcrafts involving as a root cause the failure of dynamic components, EASA received safety recommendations from accident investigators. In particular, the following safety recommendations was addressed to EASA:

AIBN report SL 2018/04: The Accident Investigation Board Norway recommends that the European Aviation Safety Agency (EASA) review and improve the existing provisions and procedures applicable to critical parts on helicopters in order to ensure design assumptions are correct throughout its service life.

AAIB report AAR 1/2023: It is recommended that the European Union Aviation Safety Agency amend Certification Specification 29.602 to require manufacturers to implement a comprehensive post removal from service assessment programme for critical parts. The findings from this should be used to ensure that reliability and life assumptions in the certification risk analysis for the critical part or the system in which it operates remain valid.

2. Rulemaking timeline



3. Proposed CM-S-007 issue 2 : Scope of parts

Clarifications on the scope of parts where CIVP should be applied:

- CIVP should be used to support the continued validity of assumptions (when applicable) made during certification that could affect the integrity of critical parts. This means that:
  - Note 1: CIVP may not be needed for all critical parts (only needed for the ones for which assumptions would require verification in service).
  - Note 2: The CIVP should not be considered as a means to replace CS-27/29 compliance demonstration. Therefore, the applicant should demonstrate compliance to all applicable certification specifications and take a conservative approach whenever assumptions are necessary.
- The focus should be on rotors, rotor drive systems, rotor control mechanisms and primary flight controls and parts with novelties (e.g. novel design features, technologies or applications)
- Should the applicant justify that sufficient experience already exists for some parts such that an assessment within the CIVP would be of limited benefit, these need not be included in the CIVP.

3. Proposed CM-S-007 issue 2 : Certification assumptions

Clarifications on the certification assumptions to be verified in service using CIVP:

Examples of certification assumptions to be verified in service through a CIVP could include:

- Failure modes, degradation mechanisms, fatigue and damage tolerance aspects:
  - Location, occurrence, severity, extent, growth rate, and type of damages (e.g. scratch, impact, corrosion, wear, fretting, loss of tightening torque, spalling, crack, disbond).
- Effectiveness of monitoring means and ICAs:
  - Such as chip detection systems, HUMS, lubrication system monitoring means and/or continuing airworthiness tasks, when these help ensure the continued integrity of the involved critical parts.
- Operations:
  - Type of operations.
  - Usage spectra.
  - Environmental conditions.

3. Proposed CM-S-007 issue 2 : CIVP plan (1/2)

CIVP plan example:

Part identification			Certification assumption addressed in CIVP	Data to be collected and evaluated for the CIVP	
System	Part name (number of parts per system)	Part reference		What	When and How many
MGB	Pinion A (x2)	AAA	No corrosion	Visual check for presence of corrosion	- At initial TBO (e.g. 1000 FH): 10 aircrafts from at least 2 different operators including one operating in corrosive environment - At extended TBO (e.g. 2500 FH): 10 aircrafts from at least 2 different operators in corrosive environment - At TBO objective (e.g. 5000 FH): 10 aircrafts from at least 2 different operators in corrosive environment
Main rotor	Bolted connection (x1 bolt)	BBB	Maximum 50% of loss of tightening torque	Tightening torque check	- At 15 FH (installation inspection): 10 aircrafts - At 500 FH (dedicated check for CIVP): 10 aicrafts - At 1000 FH (targeted inspection interval): 10 aircrafts

3. CM-S-007 issue 2 : CIVP plan (2/2)

CIVP Plan example:

MGB	Planet gear bearings (x6)	CCC	Failure mode by spalling of the inner race or roling elements detected by chip detection before reaching advanced spalling condition	Bearing detailed inspection including: - Identification of degradations - location of the potential degradation (races, rolling elements) - characterisation of the degradation (e.g. surface, depth and volume of spalling) - in case of spalling of the outer race, evaluation of the potential presence of sub-surface cracks by destructive evaluations	In case of chip detected by the chip detection system accumulated within the first 100,000 FH of the fleet: - At initial TBO (1000 FH): 10 aircrafts from at least 2 different operators - At extended TBO (2500 FH): 10 aircrafts from at least 2 different operators At TBO objective (5000 FH): 10 aircrafts from at least 2 different operators

3. CM-S-007 issue 2 : Reporting

Clarifications on the reporting of CIVP activities to Authorities:

On a case by case basis, regular reporting to the certification authority and/or validation authority on the CIVP results should be agreed. (even to report “no finding” potentially)

In addition, if a potential unsafe condition is identified, report to the competent authority for continued airworthiness. (as per Part 21.A.3A)

4. LoI and change classifications

Level of Involvement:

- May be novel, typically for 1st application of CIVP and/or when a new approach is proposed.

- May be complex, considering the complexity of the system, design and certification assumptions to be evaluated using CIVP.

- Critical, as targeting critical parts.

Change classification:

Major? A change introducing/changing the CIVP plan related to critical parts should be Major

Minor? A change introducing/changing the CIVP plan related to parts added on a voluntary basis should be Minor

4. RMT.0752

Based on the feedback received on the RMT.0128 (reg. update of CS-27/29) and the Proposed CM-S-007 issue 2, the RMT.0752 aims in particular at:

- reconsidering the scope of parts to be addressed in the CIVP activities, considering proportionality between helicopter categories;
- identifying the possibilities/process for TC holders to obtain the expected data;
- clarifying role and responsibilities between the different actors of a CIVP.
- creating new AMCs/GMs for CS-27/29 (as needed) superseding the CM-S-007

To achieve these objectives:

- an impact assessment will be done, and
- an expert group will be created.

Planning

- 2025: Terms of reference + Impact assessment
- 2026: NPA publication
- 2027: Final publication

6. Conclusions

CIVP should be considered as part of compliance demonstration to CS-27/29.602.

CM-S-007 Issue 02 is proposed to address comments / lessons learned received by EASA to clarify and alleviate the current Agency's position

RMT.0752 on CIVP to review policy on CIVP with a rulemaking group and by doing an impact assessment.

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