



EASA
European Aviation Safety Agency

Future Rulemaking Activities

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Rotorcraft Structures Workshop
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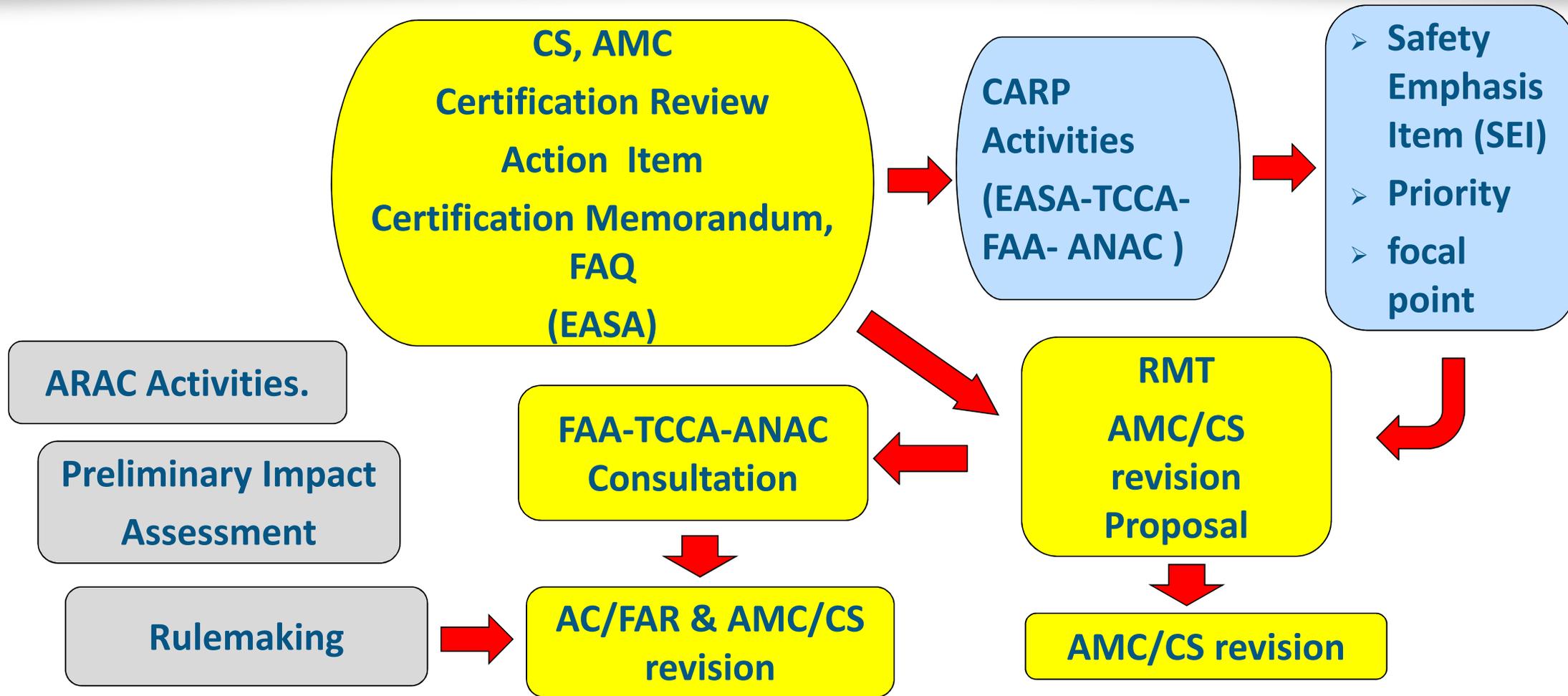


Rulemaking activities

- Rulemaking Organisation
- ARAC (Occupant Protection and Bird Impact)
- Examples of proposed AMC Revision.
- SC Vertical Take Off and Landing (VTOL)



Organisation





Aviation Rulemaking Aviation Committee (ARAC) & Preliminary Impact Assessment (PIA)

ARAC, TOR (FAA-EASA-Industries)

Rotorcraft Occupant Protection (27/29.561)

- Crash Resistant Fuel System (CRFS)
- Crash Resistant Seat and Structure (CRSS)

➤ Rotorcraft Bird Strike protection (29.610)

PIA (EASA)

➤ Rulemaking Activities with ARAC
Recommendation



Activities completed to be submitted to FAA & TCCA

	Title	Description	Impacted requirement	Revision
1	Standard fastener.	Application of standard fasteners (nuts and bolts) in critical installations	CS 27/29.601, .602, .603	AMC
2	Air density & Temperature	Air density & Temperature	27/29.337 & 309	CS or AMC
3	Seat Adapter Plate	Seat Adapter Plate	27/29.562	AMC
4	Lightning strike	Structures and rotors damage assessment after lightning strike	27/29.610	AMC
5	Proof of Structure	Analysis vs test Similarity	CS27/29.307	AMC

DONE



1. Standard fasteners

Standard Fasteners (nuts and bolts) are widely used on rotorcraft.

failed Standard Fasteners (nuts and bolts) in aviation has been observed.

If Standard Fasteners are used in Critical Installations, deviations from the standard, or installation issues may result in unexpected failure of the fastener with severe consequences at the rotorcraft level.

The intent of this AMC is to give further guidance to the Design Approval Holders (DAH) and Applicants for design approvals



2. 27/29.337 & 309 Air density & Temperature

The operational range of density should be taken into account when determining the maximum design load factor if +3.5 is not selected.

3 options to address density effects on manoeuvring load factors:

Option 1: AC Revision (FAA)

Option 2: New AMC (EASA)

Option 3: CS27/29.309

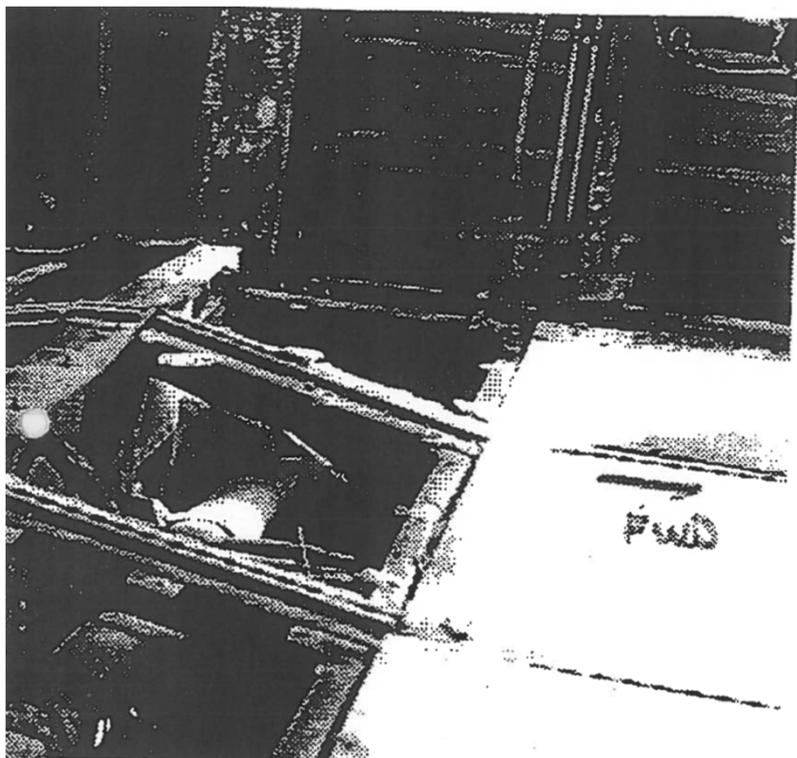
To include CS27/29.337

gust

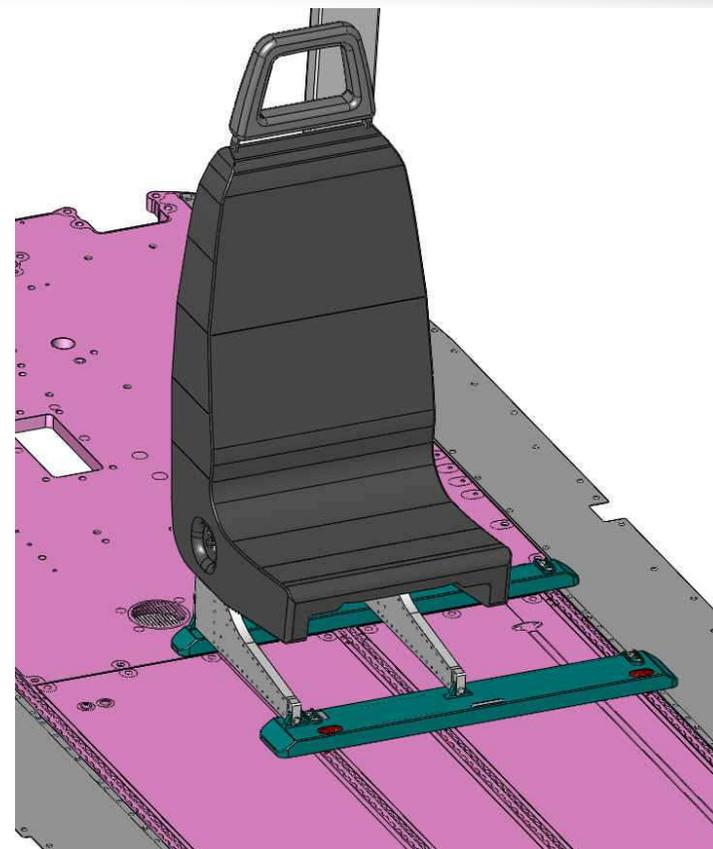
landing loads.



3. 27/29.562 Seat Adapter Plate (Example)



Floor deformation



Seat adapter plate



3. 27/29.562 Seat Adapter Plate (Definition)

The seat adapter plate includes any other forms of (new) interface structure installed between the seat and the rotorcraft floor.

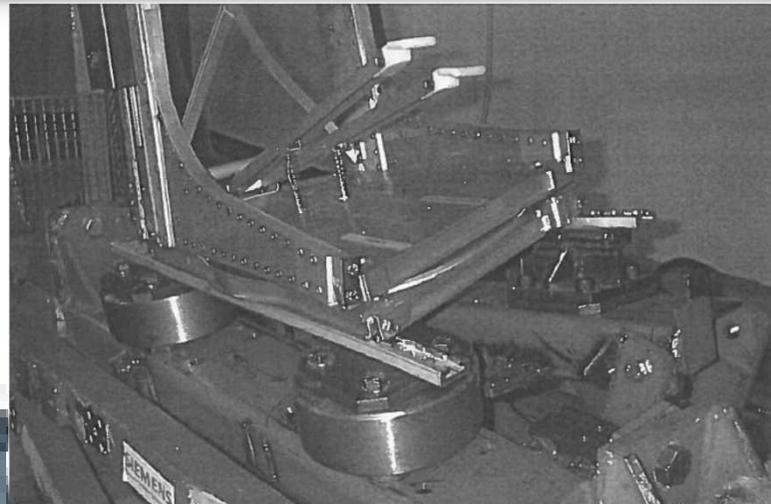
Three Different approaches proposed:

- 1) Pallet
- 2) Plinth
- 3) “as part of the floor!”

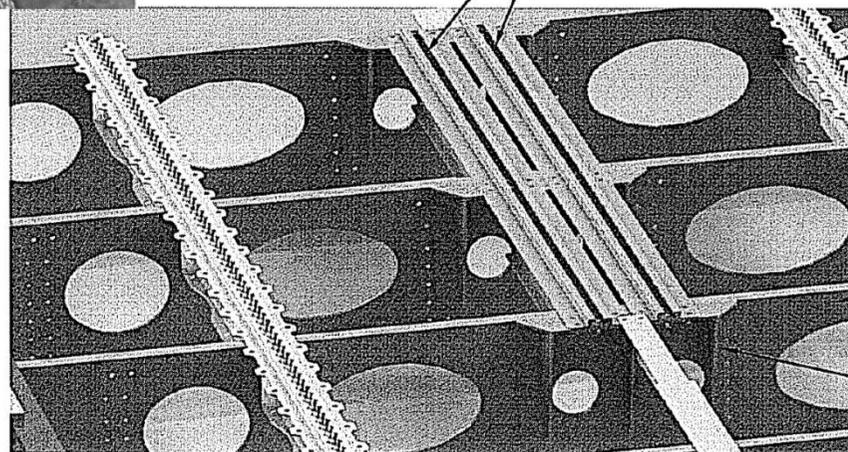


3. 27/29.562 Seat Adapter Plate

Pallet



Plinth



“as part of the floor”

New
Seat Track



27/29.610 Lightning strike

CS 27/29.610 Lightning strike

Protect rotorcraft structural components, propulsion system, gearboxes, mechanical and hydraulic control systems from lightning damage that could result in catastrophic failures.



4. 27/29.610 Lightning strike

For part with potential catastrophic consequences and exposed to damage under lightning conditions:

- Evaluation of the lightning damage (threat assessment, damage detectability...).
- A static residual strength capability supported by analysis or/and test.
- If necessary, a fatigue evaluation of a part with lightning damage for the exposure time justification before detection.
- The airworthiness instruction requested after lightning strike (flight manual and maintenance instructions, ...)



5. 27/29.307 Proof of Structure

Adoption of the AMC 25.307 to the AMC 27/29.307.

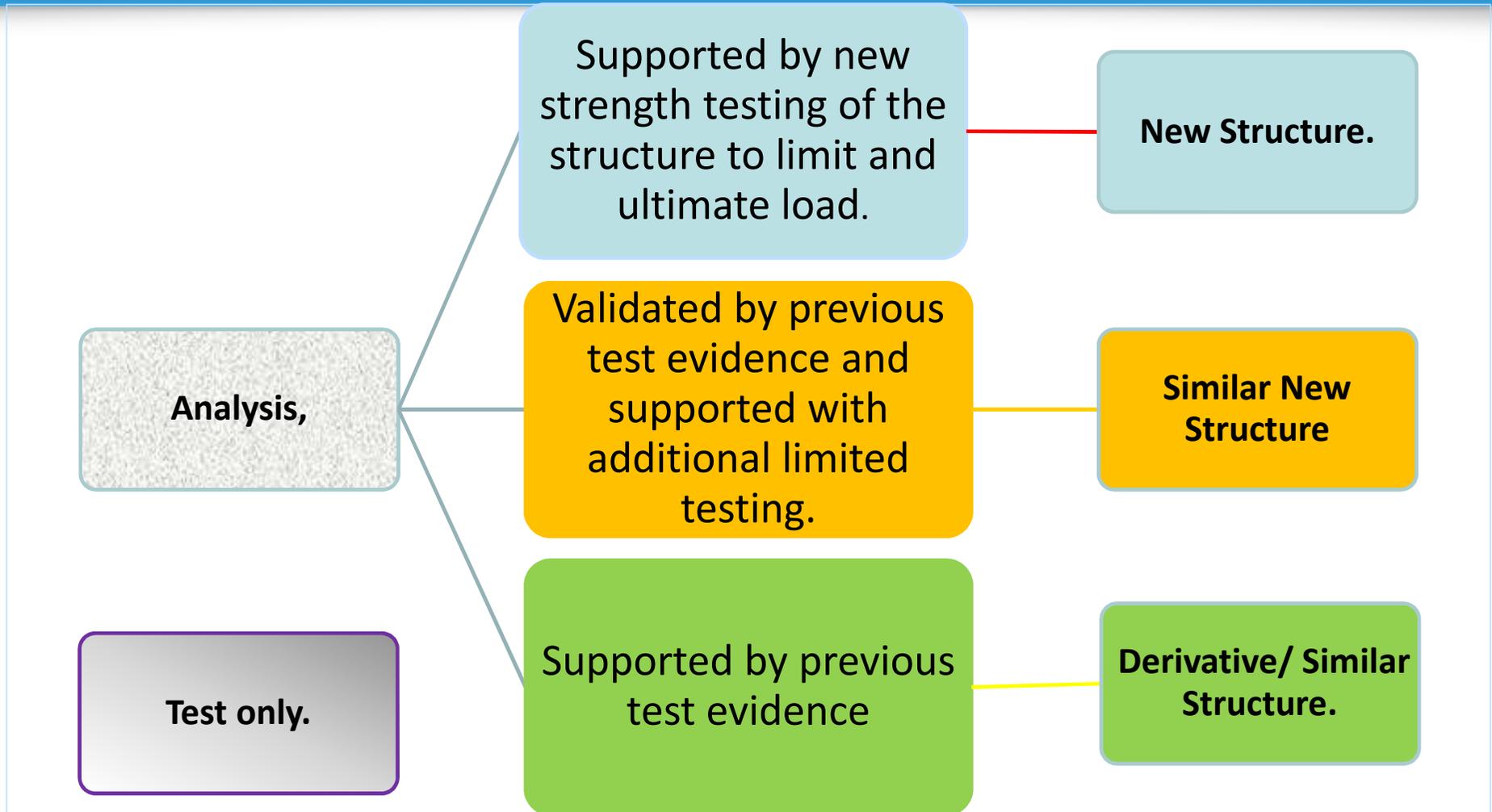
This proposed AMC establishes methods of compliance with CS 27/29.307, which specifies the requirements for Proof of Structure.

The approach described is valid for static and fatigue justification.

However similar approach can be extended for compliance with dynamic and crashworthiness requirements.



5. 27/29.307 Proof of Structure





Conclusions

- ARAC (Traditional rulemaking Process)
- CARP for SEI (Safety Emphasis Items)
- AC/AMC revision
- VTOL Vertical Takeoff and Landing (unconventional rotorcraft):
<https://www.easa.europa.eu/document-library/product-certification-consultations/proposed-special-condition-vtol>

Challenges

Incorporate consistent, relevant, harmonised (and accepted) position between the different guidance and supports.



27/29.XXX AMC to be adapted to the different CS

27/29.571 Fatigue (tolerance) evaluation:

- CS 27.571 Fatigue evaluation (safe life & fail safe) Vs
- CS 29.571 Fatigue tolerance evaluation (flaw tolerance)

E.g.: Lightning strike Damage, HEC cables

Prevent inconsistencies with existing AC/AMC



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Thank you for your attention!

Any questions....?

Your safety is our mission.

An agency of the European Union 