

Crash Resistant Fuel System (CRFS) PART 26.440

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History

1994. FAA 14 CFR Part 27 and Part 29 require newly certified rotorcraft to incorporate features to the fuel system to ensure resistance to post-crash fire (Crash Resistant Fuel Systems (CRFS)).

Issues:

Low incorporation rate of the latest CRFS requirements in the rotorcraft fleet. The number of fatal accidents where mitigation through CRFS design could have prevented fatalities or life changing injuries (2009 to 2018- 11 Accidents/12-35 Fatalities/8 Safety Recommendations).



Accidents & Safety Recommendations

AS350 B3 helicopter crash in Frisco, Colorado, US 3rd July 2015

Accident R-44 (VH-HWQ) 21/03/2013 Australia

ASTL-2015-030 & ASTL-2015-029

Recommendation to increase the number of rotorcraft equipped with crash-Resistant fuel system (production and retrofit)

Accidents EC130B4 (N356AM) 06/03/2015 and AS350B3e (N390LG) 03/07/2015, US.

“Once Airbus Helicopters completes development of a retrofit kit to incorporate a crash-Resistant fuel system into AS350 B3e and similarly designed variants, prioritize its approval to accelerate its availability to operators.”



ARAC ROPWG - CRFS Crash Resistant Fuel System

CS27/29.952 Crash Resistant Fuel Crash (CRFS)



Objective:
To prevent post crash fire in a survivable crash (No fuel leak)



Fuel Systems installation must be shown to be capable of sustaining the following:

Drop test described in CS 29.952(a) for fuel tank with adjacent structure.

Breakaway fittings

Static ultimate inertial load factors defined in CS 29.952(b)



ARAC ROPWG - CRSS Crash Resistant Seat & Structure

CS 27/29.561, 562, 785 Crash Resistant Seat and Structure (CRSS)



Objective: To prevent/minimise injury in “survivable” crash
(Seat remains attached & occupants and Items of mass restrained)

CS 27/29.561 Items of mass (including rotor & transmission) and occupant must be restrained under the required ultimate inertial load factors.

CS 27/29. 562, 785 dynamic and static requirement for Seat combined with anthropomorphic criteria (HIC)



Occupant protection history

1988: FAA and JAA introduced certification requirement for CRSS (seat)

1994: FAA and JAA introduced certification requirements for CRFS (fuel)

2003: EASA incorporated these requirements into CS-27 and CS-29

Since 2011: 9 Safety Recommendations addressed to EASA on this topic.

2015: FAA initiated ARAC ROPWG with the participation of EASA and published a set of recommendations



Crash Resistant Fuel System History

2015-2018. FAA established an ARAC Rotorcraft Occupant Protection Working Group (ROPWG) :

→ For newly manufactured rotorcraft:

- Task #1 & #2. Evaluation of the efficiency (cost/benefit) of the existing requirements
- Task #3. Existing requirements implementation or new alternative performance-based occupant
- Task #4 and #5. Cost benefit analysis if Alternative performance based is proposed.

→ For existing rotorcraft fleet:

- Task #6. Recommendations on how to improve crash safety of the existing fleet of rotorcraft

2018. US senate passed a law requiring that **from 2020 all new rotorcraft that are built and operated for the first time in the US must be CRFS compliant (or partially).**



CRFS compliant rotorcraft list (April 2020)

Make	Model (as documented on FAA Type Certificate)
Airbus Helicopters	EC120B
	EC130T2
	EC135 (all models)
	MBB-BK 117 C-2
	MBB-BK 117 D-2
	STC SR03931NY installed on the AS350B3 with Arriel 2D engine (AS350B3e)
	STC SR02492AK installed on models AS350D, AS350B, AS350B1, AS350B2, AS350BA, AS350B3 and EC130B4
Bell	427
	429
	505
Helicopteres Guimbal	CABRI G2
Leonardo	A109S
	AW109SP
	AB139 and AW139
	AW169
	AW189
MDHI	600N
Robinson	R22, R44, R66
Sikorsky	S-92A



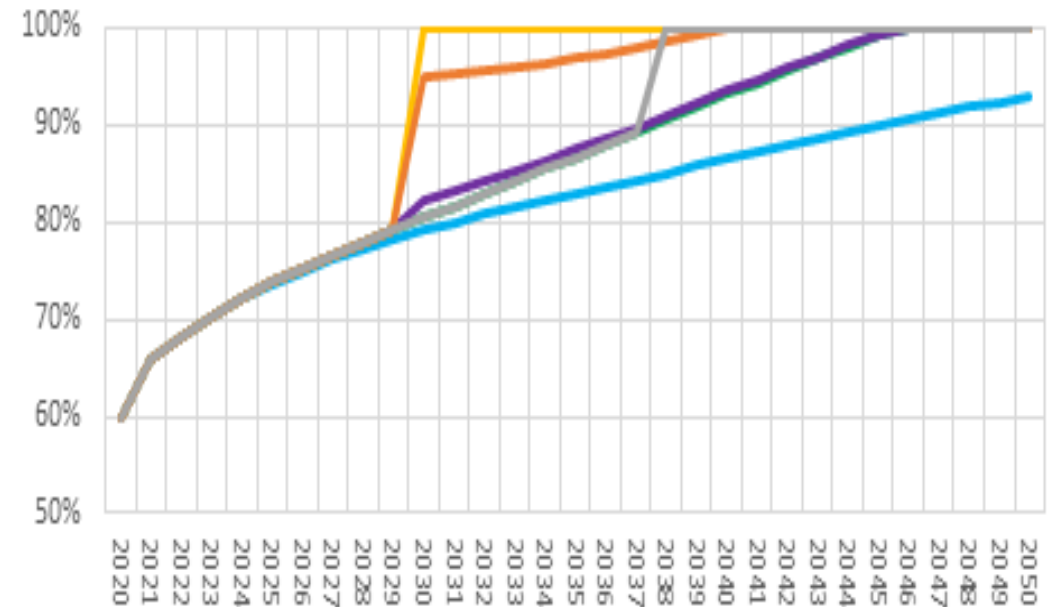
EASA Rulemaking process RMT 0710

- Terms of Reference for rulemaking task RMT.0710 (task 1 & 2)
- Comment Response Document to Draft ToR RMT.0710
- Executive Safety Committee (option 4 & 5)
- Draft PART/CS 26 sent in March 2022
- Part 26.440 & CS 26.440 published (2024)



RMT 0710 Options investigated

Option 0	Do nothing
Option 1 (US law)	All newly produced rotorcraft from 1 year after Part 26 amendment (est.2025)
Option 3	Option 1 + Whole existing rotorcraft fleet applicable from 2030
Option 4	Option 1 + Existing rotorcraft fleet with more than 5 passengers applicable from 2030
Option 5	Option 1 + Whole existing rotorcraft fleet applicable from 2038

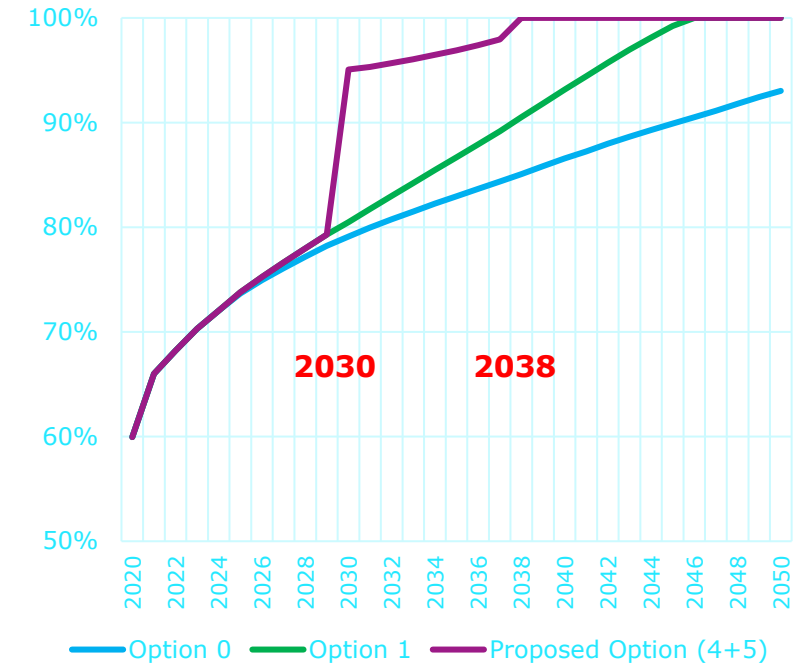


EASA Position

Option 1 (2025), mandating the CRFS for newly manufactured rotorcraft is proposed to be implemented as a minimum (US Law).

Option 4 require the compliance of **newly produced rotorcraft from 2025** and **existing rotorcraft with 5 or more occupants** with the CRFS requirements from **2030** onwards;

Option 5 for the remaining **existing rotorcraft fleet with less than 5 occupants** which would require compliance with the CRFS requirements by **2038**.



PART 26.440

Operators of small helicopters and large helicopters shall ensure that the likelihood of a post-crash fire is minimised as far as practicable in the design of the fuel system when:

(a) the helicopter type certificate was issued on or **after 2 October 1994**, and:

(1) the helicopter first **individual** certificate of airworthiness is issued on or after 22 December 2026, or

(2) the helicopter first **individual** certificate of airworthiness is issued before 22 December 2026, and:

(i) if any individual certificate of airworthiness is issued by a Member State on or after 22 December 2024 after an **import** of the helicopter from a non-Member State, or

(ii) if:

A. the helicopter has been designed for six or more occupants, and is operated on or after 22 December 2031; or

B. the helicopter has been designed for five or less occupants, and is operated on or after 22 December 2039.

Manufactured

Imported

Retrofit



PART 26.440

(b) the helicopter type certificate was issued before 2 October 1994, and:

- (1) the helicopter first individual certificate of airworthiness is issued on or after 22 December 2026 or,
- (2) the helicopter first individual certificate of airworthiness is issued before 22 December 2026 and if any individual certificate of airworthiness is issued by a Member State on or after 22 December 2024 after an import of the helicopter from a non-member

Manufactured

Imported

TC < 1994 - TC < 1994



PART 26.440 (in production)

Applicability:

TC issued before 1994 (b)(1) & after 1994 (a)(1)

Effectivity date: 22 December 2026

Requirement

CS 29.952 (a)(1) to (a)(3), (a)(5), (a)(6), (c), (f), (g), 29.963 (b) & 29.975(a)(7)

CS 26.440 (a) (see FAA US law 49 U.S.C. § 44737 (2018) established by the FAA Reauthorization Act of 2018 (H.R. 302, Pub.L. 115-254), Section 317, HELICOPTER FUEL SYSTEM SAFETY)



PART 26.440 (Imported)

Applicability:

Individual certificate of airworthiness is issued by a Member State on or after 22 December 2024 after an import of the helicopter from a non-Member State.

- TC issued after 1994 (a)(2)(i)
- TC issued before 1994 (b)(2)

Effectivity Date: 22 December 2024

Requirements

CS 26.440 (b) (29.952 (a)(1) to (a)(3), (a)(5), (a)(6) (f) & 29.963 (b)(*)

(*) 250 or 370 lbs



PART 26.440 (In service, retrofit)

Applicability

TC issued after 1994 (a)(2)(ii) (A) &(B) 2031 (≥ 6 Occupants) or 2039 (< 6 Occupants)

Effectivity Date:

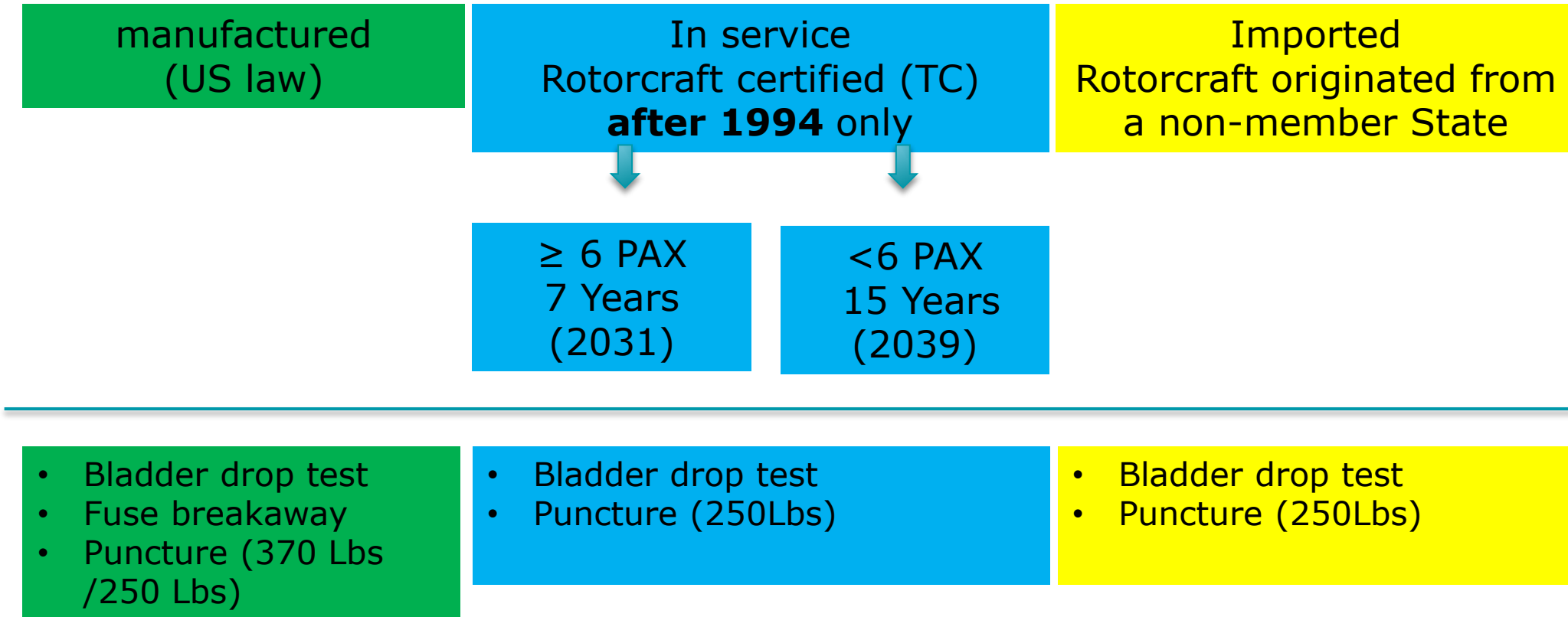
- 22 December 2031 (≥ 6 Occupants) or
- 22 December 2039 (< 6 Occupants)

CS 26.440 (b) (29.952 (a)(1) to (a)(3), (a)(5), (a)(6) (f) & 29.963 (b)*

(*) 250 or 370 lbs



CRFS Summary



PART 26.440 - Conclusion

- PART 26.440 published
- Contact with NAAs in charge of the registration
- CRFS compliance status list (TCHs & PCMs support)
- Promote CRFS Kit or Modifications
- Communication during Workshop, Forum (symposium)...
- EASA Webpage under construction...



Thank you
for your attention!

Your safety is our mission.



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