CCHRAG Status

Cargo Compartment Halon Replacement Advisory Group

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International Coordinating Council of Aerospace Industries Associations

CCHRAG - organisational context



Going beyond CCHRAG: HAC³

HAC³ aims at sharing:

- ✓ Planning, status and results for
 - o performing FAA cargo halon replacement task group MPS tests
 - o performing material compatibility testing for alternative agents
 - performing shelf life testing for alternative agents
 - developing new instrumentation to be used in flight testing of new agents
 - o generic flight test for demonstrating performance of new agents
- General guidelines for tubing designs for alternative agents to ensure proper distribution in the compartment
- Methods for addressing health and safety regarding unintended exposure to maintenance personnel and aircraft occupants
- Coordination with environmental regulators for approval of alternative agents, such as EPA SNAP and TSCA approvals and European Union ECHA approvals



ICAO A41 WP 2022



ASSEMBLY — 41ST SESSION

TECHNICAL COMMISSION

Agenda Item 31: Aviation Safety and Air Navigation Standardization

AIRCRAFT HALON REPLACEMENT

(Presented by the International Coordinating Council of Aerospace Industries Associations (ICCAIA) and the International Federation of Air Line Pilots Associations (IFALPA))

EXECUTIVE SUMMARY

Industry is actively pursuing alternatives to Halon for commercial airplane cargo fire protection, and meeting the ICAO 2024 deadline seems achievable. However, many candidate agents, as well as already-approved substitutes for halon in other aircraft fire protection applications, are at risk of being subject to the proposed ECHA (European Chemical Agency) PFAS regulation, which on a mid-term perspective will not be limited to Europe. It will be very important to consider aircraft fire suppression as an essential use of PFAS regulations on a global scale, in order to maintain progress in replacing halons.

Action: The Assembly is invited to:

- a) Acknowledge the significant impact of international PFAS (Per- and PolyFluoroAlkyl Substances) regulations on the schedule of Aircraft Halon replacement efforts.
- b) Request the ICAO Council to urge memoer states to consider classifying the application of already fire protection as permanent essential use or to grant permanent derogation/exemption to ensure the safe continuation of air transportation using the best available options.
- c) Request the ICAO Council to urge harmonization between member States on the classification and restriction of chemicals as essential for the safety of aviation

Strategic This working paper relates to the Safety Strategic Objective.



2022 CCHRAG risk assessment

Criterion	2019 Conclusion	2021 Conclusion	2022 status	Remarks
Cup burner fire extinction/suppression concentration established (ISO, NFPA)	Achievable	Achievable	Achievable	
FAA MPS testing concentration determined	Achievable on condition	Achievable	Achievable	2 agents have passed MPS testing, 2 show potential. Continued technology development is needed to guarantee successful certification
Agent & System Weight is less than or equal to Halon system	Not Achievable	Not Achievable	Not Achievable	A weight increase cannot be avoided for any of the halon replacement solutions presented. A consequence is an increased CO2 emission caused by higher fuel burn.
Clean agent (gaseous) - no clean up	Achievable	Achievable	Achievable	All candidate agents that have passed MPS are gaseous
Currently used in other industries and/or applications	Achievable	Achievable	Achievable	One solution is dedicated to the aircraft industry.
Risks for aircraft system adaptation/integration are mitigated or low	Achievable on condition	Achievable on condition	Achievable on condition	Three participants additionally mitigated the risks from 2019.
Not Present on regulatory lists	Full compliance will take time and resources.	Achievable on condition	Risk to be mitigated	High risk that candidate replacements will be regulated as PFAS.
Toxicity is less than or equal to Halon 1301		Achievable on condition	Risk to be anticipated	Need to monitor: toxicity may be greater than Halon 1301
Current TRL is equal or greater than 4	Achievable	Achievable	Achieved	
TRL6 Roadmap in place	-	Achievable on condition	Achieved	Pandemics has slowed down efforts of some participants. Roadmap in place for at least 2 candidate agents with TRL6 before 2024



ICAO Conclusion on WP96

A harmonized approach between member States on the classification and restriction of chemicals as essential for the safety of aviation will be critical to ensure that aircraft can continue to safely fly.





Industry's view on Halon replacement agent

ICAO Scope: New type certificates

- The only substitute identified by the industry for Cargo FireEx System which has passed TRL6 is Verdagent[™], a blend of 2-BTP and CO2.
 - As per EU restriction proposal, 2-BTP (thus Verdagent[™]) is classified as PFAS.
 ⇒ Consequently, would be banned by 2039, thus at same time horizon as Halon in EU.
 - Compared to Halon, Verdagent offers (at iso mass) lower fire extinguishing performance
 ⇒ This induces mass penalties
- Potential Halon & PFAS free alternatives may be inert gas solutions (far from TRL6)
 - Compared to Verdagent[™], inert gases offer (at iso mass) significantly lower fire suppression performance.
 - \Rightarrow Foreseen significantly higher mass penalties.
 - ⇒ Foreseen Impact transfer from Ozone Layer Depletion to Climate Change domain



Conclusion and key messages

- The only technically feasible solution for Halon replacement identified to date raises issues and compliance is at risk
- Need to have harmonization on global level on potential substitutes to Halon for fire suppression applications
- Additional risk:

Halon obsolescence will be increasing by next decade



Sharing this information

This presentation was given:

- 10 June 2024 ICCAIA Airworthiness Committee
- 09 July 2024 European Commission Rep @ ICAO
- 11 July 2024 ICCAIA Strategy Committee

Support was offered

Advocacy Position to be aligned in CCHRAG



Thank you!



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