



# **Cargo Compartment Halon Replacement Working Group (CCHRWG) Update**

*October 30, 2014*

*International Aircraft Systems Fire Protection Working Group Meeting  
Atlantic City, NJ*

***By***

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## **ToR Commit Industry to Broad Stakeholder Approach**

### **Task:**

ICCAIA shall establish a working group tasked to work on Halon Replacement issues for Cargo compartments.

Under the ICCAIA-AC authority, the working group shall establish and coordinate a process to:

- Develop an industry recommendation to ICAO for a cargo compartment halon replacement deadline for new design (new aircraft types) taking into account progress towards identification of an alternative agent and/or approach to fire suppression in cargo compartments, including the state of research (available agent, viability), supply chain readiness, testing, qualification, and certification.
- To enable this deliverable, the work group will encourage/support timely research, testing and approval of a halon alternative for cargo compartments, in coordination with the relevant industry and governmental/certification entities, including:
  - Inviting non-member industry associations to participate as appropriate.
  - Facilitating the exchange of non-proprietary research data.
  - Collecting information and reporting to the ICCAIA-AC.
  - Continuing dialogue with government/certification entities.



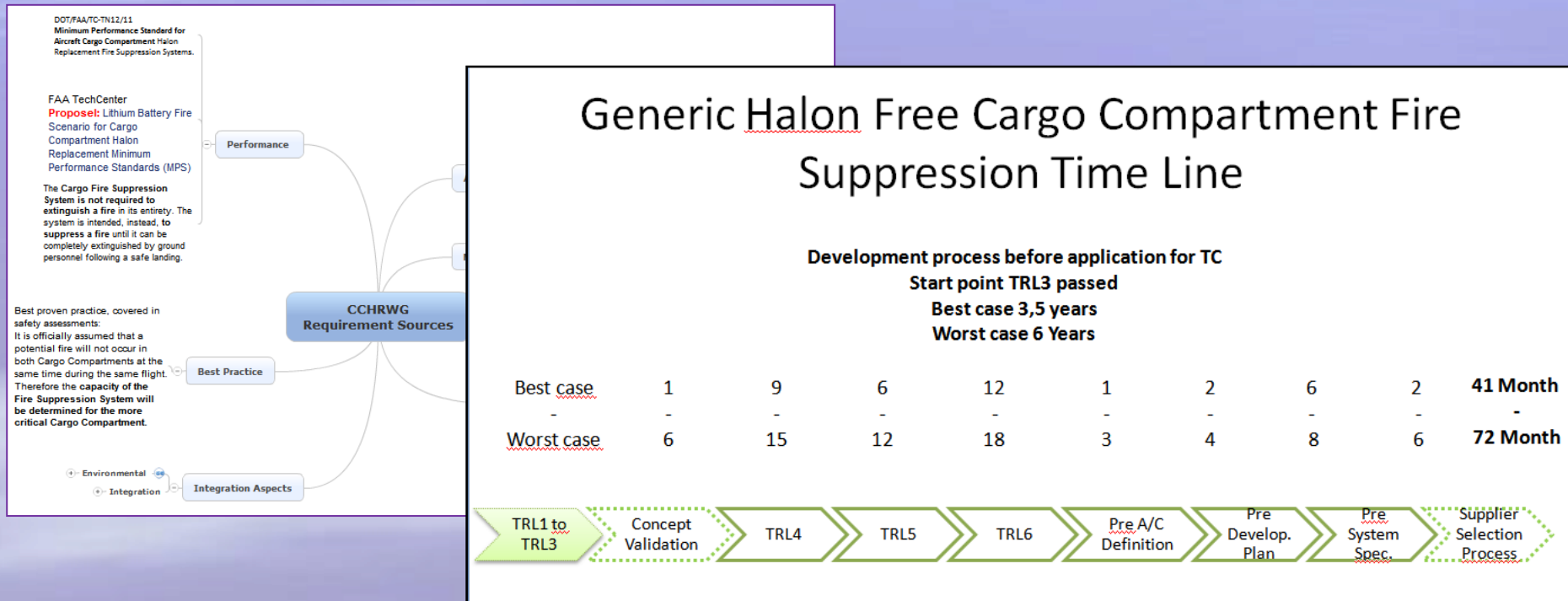
## **The Work Plan is progressing**

- Outreach and engagement with stakeholders continues
  - 6 Stakeholder WG teleconferences have been held
    - With nearly 100 invitees
    - From nearly 40 different organizations
    - Representing 7 different sectors including
      - Fire protection system and extinguishing agent manufacturers
      - Airline and cargo aircraft operators
      - Academia and research institutions
      - Authorities as advisors on regulatory and certification issues
  - 2 Face-to-Face Stakeholder Meetings held since May 2013 Kick Off meeting
    - Next meeting on October 31<sup>st</sup> in Atlantic City, NJ
- Roadmap to Action in-work
  - First Deliverables: Requirements & Timeline Documents



# Stakeholder Engagement Critical for Next Steps

- Time Line provides a development “schedule” after discovery of a new agent or system (Technology Readiness Level 3)
- Next Step will identify TRL3 candidates







# Stakeholders to develop Action Plan at Face-to-face Meeting (October 31)

International Coordinating Council of Aerospace Industries Associations  
**CARGO COMPARTMENT HALON REPLACEMENTS  
ACTION PLAN**

**Research Activities<sup>1, 2</sup>**  
*Incorporate non-proprietary research on halon replacements into plan*

- NIST Combustion research study on FAA MPS aerosol can test (2009-2013)
  - Results: Modeling of chemistry shows lean mixture flammability characteristics
  - Technology Status: TRL1 – Research expanding with input from refrigeration industry
- Hybrid Halon/Nitrogen from fuel tank inerting system
  - Results: Intermediate solution – reduces halon quantity, does not replace
  - Technology Status: Implementation on hold
- Hybrid Watermist / Nitrogen System (AOA)
  - Results: Improvement to former water mist system from FAA TC concept
  - Technology Status: TRL3 – will not be implemented
- Hybrid Generic Knockdown / Fuel Cell component valve
  - Results: Fuel Cell component valve
  - Technology Status: TRL 4
- Cargo container w/dry chemical?
- Fedex system w/foam injection in
- Others?

**Notes:**  
1. Information source: ICCAIA CCHRWG, non-proprietary  
2. Timeline for Development begins after TRL3; these are

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**CARGO COMPARTMENT HALON REPLACEMENTS  
ACTION PLAN (cont'd)**

**Development Timeline Risks and Opportunities**  
*Note potential schedule risks and opportunities that have been identified, and implications to the overall schedule*

- Recommended revision to FAA MPS to include lithium battery fires could delay development of halon fire extinguishing agent replacement

tion process  
actively engaged

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**CARGO COMPARTMENT HALON REPLACEMENTS  
ACTION PLAN (cont'd)**

**Cooperation Opportunities**  
*Explore options to cooperate with regard to identifying promising design approaches and/or extinguishing agents*

- NIST flammability of halogenated hydrocarbons (Oct 2014)
  - Objective: New chemical or combination of agents
  - Status: Preliminary, exploration
- ICAO Lithium Battery Multidisciplinary Group
  - Objective: Coordination may impact schedule if any halon replacement needs to meet lithium battery performance requirements (tbd, equivalent to halon)
  - Status: Recommendation to be reviewed by AirNav Committee and to be discussed @ IHRCM/4
- Provide coordinated OEM/regulatory authority support to knock-down (watermist) system or inerting (nitrogen) suppression system suppliers
- Others?

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## Action Plan Leads to ICAO Recommendation

- Develop Action Plan with schedule (ECD Dec 2014)
  - Incorporate non-proprietary research on halon replacements into plan
  - Explore options to cooperate with regard to identifying promising design approaches and/or extinguishing agents
  - Note potential schedule risks and opportunities that have been identified, and their implications to the overall schedule
- Obtain commitment to support Action Plan from relevant stakeholders
  - Kick-off Action Plan (ECD May 2015)
  - Recommend a deadline for cargo compartment halon replacements for consideration during 2016 General Assembly (ECD Dec 2015)
- Continue ongoing stakeholder outreach and engagement
  - Contacts:  
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# Thank you!

*Contact:*

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*Rolf Greiner (ROLF.GREINER@airbus.com)*



## Roadmap to Action

Collect & document requirements for cargo compartment halon replacements (ECD Dec 2013)

- Agent (US EPA SNAP, material compatibility, commercialization)
- System (Concentration, distribution, duration)
- Component (Temperature, vibration, electrical, software, reliability)
- Regulatory (MPS, FARs, ACs, standards)
- Certification (Component qualifications, system test demonstrations, flight test)
- Maintenance (dispatch reliability, lifecycle/duration of parts, repair procedures)

Map requirements into a flow diagram (ECD June 2014)

- Investigate and evaluate options to harmonize requirements across stakeholders
- Determine dependencies and sequence between requirements
- Estimate time needed to meet each requirement
- Identify complete list of current and potential agents noting pros/cons

Develop Action Plan with schedule (ECD Dec 2014)

- Incorporate non-proprietary research on halon replacements into plan, and/or
- Explore options to cooperate with regard to identifying promising design approaches and/or extinguishing agents
- Note potential schedule risks and opportunities that have been identified, and their implications to the overall schedule

Obtain commitment to support Action Plan from relevant stakeholders

- Kick-off Action Plan (ECD May 2015)
- Recommend a deadline for cargo compartment halon replacements for consideration during 2016 General Assembly (ECD Dec 2015)