

Engine/APU Halon Replacement Industry Consortium – Halon Alternatives for Aircraft Propulsion Systems (HAAPS) - Update

August 3-6, 2020

FAA INTERNATIONAL AIRCRAFT SYSTEMS FIRE PROTECTION FORUM
VIRTUAL MEETING

By (Alan Macias) Boeing GBM of HAAPS

HAAPS Charter and Statement of Work

- Define common non-halon fire extinguishing solution(s) for use in engine/APU fire zones that...
 - is compliant to basic industry and regulatory requirements
 - meets multiple OEM (airframe, engine, APU, nacelle, etc.) requirements
 - meets multiple governmental agency regulatory requirements;
 - provides a viable business solution for Consortium partners; and
 - is production-ready
- Engage...
 - Primary Stakeholders = Airframer OEMs
 - Firex Agents/System Suppliers, Airlines, engine companies, nacelle suppliers, airworthiness authorities, etc.
 - A focal point, facilitator & fiscal/contracting “Managing Entity” (ME)

HAAPS Organization

Halon Alternatives for Aircraft Propulsion Systems (HAAPS)

Joint
Collaboration
Agreement
(JCA)

Technical Direction

Governing Members

Airbus

Boeing

Bombardier

Embraer

Textron, Inc.

OAI*

*non-voting

Administrator Ohio Aerospace Institute



- Fiscal, legal representative
- Day-to-day Administrative & Contract Mgmt.
- Facilitator

Governance Board (GB)

- Strategy, Advocacy
- Consortium Oversight
- Approve Participants
- Budgets, Funding Allocation
- Define Project Requirements / Selection
- Product Integration

Negotiated
Agreements
(as appropriate)

Project Teams

- Established by GB
- Prepare proposals in response to GB defined requirements and relevant funding opportunities
- Resources, cost share commitment (as appropriate)
- Execute funded projects
- Share results through GB

Industry and Advisor Members

- Airworthiness Certification Authorities
- Environmental Regulatory Authorities
- Aircraft Operators
- Aircraft Component OEMs
- Extinguisher System Suppliers
- Universities
- Consultants
- Other Stakeholders

HAAPS Critical Milestones



HAAPS/FAA Familiarization Meeting (Sept. 26 2018)

- Preliminary Certification Path Proposals Development
- High Level Request For Information RFI
- 1st Down Selection (“Step 1” RFI)
- Solutions(s) Requirements Definition
- Detailed RFI (“Step 2” RFI)
- Down Select Finalists for In-Depth Evaluation in Phase III
- Phase III Statement of Work Definition
- Technical Readiness Level (TRL) Defined
- Agreements with Supplier(s) - planning

- In-Depth Evaluations of Down Selected Candidates
- Agreements with Supplier(s)

Post-HAAPS – Solution(s) Incorporation (TRL 9) →

- Air framer member’s independent certification activities
- Utilize HAAPS Certification Path, MOCs agreements, test and qualification data, etc. and other to support airplane integration

Phase II Solutions Down-Selection - Completed

- More than 40 potential suppliers identified globally;
 - From chemical companies to aerospace suppliers;
- Majority were contacted which demonstrated interest
 - subset received an initial RFI with the HAAPS requirements document;
- After several GBM reviews and potential supplier telecons, approximately 10 suppliers signed PIAs and were evaluated in depth by GBM based on second RFI submittal which provided more details
- Down Selection Results Summary
 - Two primary solutions candidates selected to be evaluated
 - Phase III – Projects #1 and #2
 - One standby primary solution backup candidate selected for Phase III
 - Three potentially promising solution candidates identified
 - development being monitored for possible future Phase III entry

Phase III Statement of Work

- Phase III – execute activities required to produce the solution(s)
 - Formal start pending signature of working agreement by all parties
 - Selected Phase III activities underway
 - Detail evaluation of selected supplier(s) final proposals (system and agent)
 - Extinguishing performance, qualification, weight/volume impact, material compatibility, environmental & health acceptability, new/restarted testing (e.g. MPSHRe, possible gnd and/or flt aircraft tests), MPSHRe open issues, project risks, concentration measuring equipment, etc.
 - Compile Regulatory Requirements & Develop Certification Path Proposals
 - Follow-up certification authorities engagements
 - Discussions with certification authorities in regards to final solution MOC/MeOC agreement
 - Issue Paper and CRI requirements
 - Phase III schedule/TASK preparation
 - Final down selection(s)

Contacts, Announcements & History

- Ohio Aerospace Institute (OAI) <http://www.oai.org/>
 - Don Bailey, HAAPS Project Manager DonBailey@oai.org, Phone: 440- 962-3050
- OAI's HAAPS Press Release – Phase I
 - <http://web1.oai.org/oaiweb.nsf/wnews/B16B96B2AFB1763D85257DD9004F0B28?OpenDocument&sc=2>
- OAI's HAAPS Press Release – Phase II
 - https://www.prnewswire.com/news-releases/haaps-consortium-seeks-replacement-for-halon-1301-300817203.html?tc=eml_cleartime
- ICCAIA Support of HAAPS Consortium
 - <http://www.aia-aerospace.org/news/iccaia-supports-international-consortium-seeking-alternatives-to-halon-fire-suppressant/>
- IASFPWG Meeting, Cologne, Germany, May 22-23, 2013 – Consortium Proposal
 - <https://www.fire.tc.faa.gov/pdf/systems/May13Meeting/BennettMacias-0513-ICInterestEgineAPU.pdf>
- Halon Alternatives Research Corporation (HARC) sponsored Aviation Stakeholder's Meeting Chicago, Illinois, U.S.A., 11 June, 2013 – Consortium Proposal
- 2013 ICAO Assembly recognized consortium commitment , Resolution 31/1: Halon replacement ([link](#))

Thank you!