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

May 14, 2019
INTERNATIONAL AIRCRAFT SYSTEMS FIRE PROTECTION FORUM MEETING
Cologne, Germany

By
Stephane Pugliese – Airbus SAS
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)

Governance Board (GB)
- Strategy, Advocacy
- Consortium Oversight
- Approve Participants
- Budgets, Funding Allocation
- Define Project Requirements / Selection
- Product Integration

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

Joint Collaboration Agreement (JCA)

Technical Direction

Governance Members
- Airbus
- Boeing
- Bombardier
- Embraer
- Textron, Inc.
- OAI

Administrator
Ohio Aerospace Institute
- Fiscal, legal representative
- Day-to-day Administrative & Contract Mgmt.
- Facilitator

Industry and Advisor Members
- Airworthiness Certification Authorities
- Environmental regulatory authorities
- Aircraft Operators
- Aircraft Component OEMs
- Extinguisher system suppliers
- Universities
- Consultants
- Other Stakeholders

Negotiated Agreements (as appropriate)
HAAPS Critical Milestones

Phase II (1 Year Maximum)

- Formal Start to Phase II* - 15 Oct. 2018
- RFIs to Suppliers – End Oct 2018
- RFI Response Evaluations & Preliminary Down Selection Workshop (March 25-28, 2019)
- HAAPS/FAA Familiarization Meeting (Sept. 26 2018)

Year 1 – Phase II

• 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)

Phase III (3 Years Maximum)

- Phase II Down Selection/Closeout & Phase III Start Workshops – Oct./Nov. 2019 – Montreal - Tentative
- Evaluation Collaboration Contract Awards - SOW, etc. – ENDS PHASE II (est. by Oct. 2019)
- Final Solutions(s) Selected - ENDS PHASE III (est. by Oct. 2022)

Year 1 - Phase III

• In-Depth Evaluations of Down Selected Candidates
  - Extinguishing performance, qualification requirements, weight/volume impact, Material compatibility, certification path refinement, certification documentation development, environmental & health acceptability, new/restarted testing, etc.

Year 2 – Phase III

Year 3 – Phase III

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

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HAAPS Charter and Statement of Work

• Phase I – Joint Collaboration Agreement (JCA)
  • Primary working together agreement signed June 2018
    • Airbus, Boeing, Bombardier, Embraer, Textron, and Ohio Aerospace Institute

• Phase II – Development of Technical Statement of Work & Industry Engagement

• Phase III – execute activities required to produce the solution(s)
  • Solicitation of supplier proposals
  • Proposal evaluation and down selection
  • MOC/MeOC agreement
  • Testing & analyses
  • Selected solution(s) agreement
HAAPS Charter and Statement of Work

- Phase II – Development of Technical Statement of Work & Industry Engagement

**COMPLETE**
- Design Requirements Document – Initial Issue
  - General & gaseous agent requirements
- Initial FAA Engagement
- Phase II supplier engagement documentation

**IN DEVELOPMENT**
- High level solution(s) strategy
- Design Requirements Document – Future Reissue
- Other agent types
- Performance validation, down selection criteria
- Compile Regulatory Requirements & Develop Certification Path Proposals
- Follow-up FAA engagement – Summer 2019
- Phase III supplier engagement documentation
HAAPS Charter and Statement of Work

• Phase II – Development of Technical Statement of Work & Industry Engagement

  • RFIs to Suppliers – “Step 1” COMPLETE
    • Requested high level information on Solution(s) candidates
    • Numerous RFIs transmitted
      • Firex system suppliers, firex agent suppliers, firex distributors, chemical companies
    • Down selected to approximately 10-12 solutions proposals

  • RFIs to Suppliers – “Step 2” IN PROGRESS
    • Evaluates down selected solutions from “Step 1” in greater detail
      • Conformance to HAAPS Design Requirements Document

  • Down Selection of “Step 2” Solutions Proposals IN PROGRESS
    • Successful proposals move into Phase III evaluations
      • Business agreements, statement of work definition, deliverables responsibilities, schedules
Contacts, Announcements & History

- Ohio Aerospace Institute (OAI) [http://www.oai.org/](http://www.oai.org/)
  - Don Bailey, HAAPS Project Manager [DonBailey@oai.org](mailto:DonBailey@oai.org), Phone: 440-962-3050

- OAI’s HAAPS Press Release – Phase I

- OAI’s HAAPS Press Release – Phase II

- ICCAIA Support of HAAPS Consortium

- IASFPWG Meeting, Cologne, Germany, May 22-23, 2013 – Consortium Proposal
  - [https://www.fire.tc.faa.gov/pdf/systems/May13Meeting/BennettMacias-0513-ICInterestEngineAPU.pdf](https://www.fire.tc.faa.gov/pdf/systems/May13Meeting/BennettMacias-0513-ICInterestEngineAPU.pdf)

- Halon Alternatives Research Corporation (HARC) sponsored Aviation Stakeholder's Meeting

- 2013 ICAO Assembly recognized consortium commitment, Resolution 31/1: Halon replacement ([link](#))
Thank you!