HALON ALTERNATIVE OPPORTUNITIES FOR H-60 HELICOPTERS

Presented to:

Halon Options Technical Working Committee (HOTWC)

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NAVAIR
AIR VEHICLE ENGINEERING

THE ISSUE

- Navy's SH-60B/F Aircraft Being Replaced with New MH-60R/S Aircraft
- Non-Halon Engine Fire Extinguishing System is Required

- Solution Planned for all Navy's MH-60R/S Aircraft

THE APPROACH

- Three Phase R&D
- Full Navy Program Office Buy-In;
  with Renewed Army Interest
- This is a Navy Effort, with Joint Opportunities
  - TEAMHAWK Model
  - On-Going Navy / Army Discussions

PHASE I

Analytical Study

- Conceptual Design, Implementation and Cost Studies for a Non-Halon Engine Fire Suppression System

- ***Status***: Completed in Summer 2003
  - HFC-125 Identified as Suitable Replacement

PHASE II

Preliminary Design & Risk Reduction Prototype Testing

- Advance Concept to Preliminary Design
- Construct Prototype System
- Conduct Risk Reduction Testing

- ***Status***: On-Going

H-60 TEST ARTICLE @ PAX

RISK REDUCTION TESTING

- Requirement: *Better Than Or Equal To Halon*
- Establish Halon Baseline
  - Define and Quantify Relight Conditions
  - 3 Different Fire Locations; 3 Different Airflows; 2 Different Exhaust Configurations
- Optimize Alternate Agent Weight, Without Changing the Plumbing
  - Three Discharge Points
  - Larger & Already-Qualified H-53 Bottle To Be Used
  - Goal: 2.5 # Halon →→→ 3.7 # HFC-125 (Max in H-53 Bottle)

- ***Planned***: Completed Oct 06

PHASE III

Production Design, System Qualification and Implementation

- Finalized System Design
- Qualification Tests on First Article Aircraft

- ***Planned***:
  - Flight Tests for Qualification: FY07
  - HFC-125 Implementation Schedule
    - FY09: Solution Incorporated into Production Line
    - FY11: Solution Backfitted Into Waivered MH-60R/S

THE OPPORTUNITY

- Requirement for 2nd Shot?
  - Both Single and Second Shot Capability to be Tested

THE DATA (NAVY H-60)

- Naval Safety Center Data
  - 1983 through 1998 & March 2001 Incident
  - In-Flight Fires: Three (3)
    - (1) Electrical: Self-Extinguished, Location Unknown
    - (2) Engine:
      - No. 1 Engine: Self-Extinguished When Engine Secured
      - No. 2 Engine: Aircraft Lost at Sea; FIREX System Not Activated
    - Fire Suppression System NOT Utilized in Any In-Flight Fires
  - Ground Fires: Five (5)
    - All in APU
    - 4 of 5: Accumulation of Residual Fuel From Previous Start Attempts

THE DATA (Cont'd)

- H-60 Reserve Bottle (2nd Shot) Effectivity
  - 2 Attempts, 1 Success
  - Both APU Ground Fires
  - All Rotary Wing Aircraft 1977 – 1993:
    - 14 Attempts, 1 Success
  - Navy Data Only
- Loss of 2nd Shot
  - Negligible
  - H-60 2nd Shot Only Used on Ground to Combat APU Fires
  - Portables and Ground Crews Available for Ground Emergencies
- Safety Center Data (Navy & Army) Currently Being Updated

CONCLUSION

- Navy Drives Toward Navy Solution
- Continued Deliberations Over Need/Benefit of Second Shot
- Opportunity to Replace One Agent (Halon) with One Agent (HFC-125) Throughout H-60 Community