HALON ALTERNATIVE OPPORTUNITIES FOR H-60 HELICOPTERS

Presented to:
Halon Options Technical Working Committee (HOTWC)
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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 2\textsuperscript{nd} 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