

CARRIER AIRCRAFT FIRE SUPPRESSION SYSTEM

Program Overview

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ABSTRACT

Joint Department of Defense (DoD) efforts thus far have proven unsuccessful in identifying an acceptable alternate to Halon 1211, the streaming agent used in portable fire extinguishers and ground-based fire rescue vehicles. The Naval Air System Command has initiated efforts to re-address the overall program objective from strictly a chemical replacement standpoint to a systems requirements standpoint. That is, before continuing the search for an elusive drop-in replacement chemical that meets the considerable performance and material characteristics of Halon 1211, this program intends to evaluate formally each of the underlying threats currently countered by Halon 1211, in order to assess properly the "real" requirements that any alternate protection system need meet to be deemed acceptable. In this manner, it is envisioned that agents/systems already labeled as less than acceptable as a drop-in might find favor when evaluated against these "real" requirements. The NAVAIR-Halon 1211 alternative program is structured into the following assignments:

Assignment I - Halon 1211 Alternative Development Status: Evaluation of past and continuing work being conducted by the DoD to identify an acceptable alternate chemical for Halon 1211, with particular attention to defined agent acceptability criteria.

Assignment II - Halon 1211 Mission Critical Reserve Evaluation: Development of accurate representation of existing stores, "ownership" provision, and reliable draw-down predictions to assess properly the criticality of the alternate agent.

Assignment III - Halon 1211 Requirements Review: Proper definition of the metrics used to evaluate the proposed systems. Investigation into the actual firefighting requirement for each threat is required to determine the overall need to be met, rather than just a relative comparison of chemicals.

Assignment IV - Halon 1211 Use Minimization: Evaluation of training, maintenance, recycling, and inadvertent discharges for potential material or procedural enhancements.

Assignment V - Re-Focused Halon 1211 Replacement RDT&E: Should it be shown that use minimization and re-evaluation of system requirements do not lead toward usage levels supportable by existing stockpile assets, an acceptable alternative(s) must be identified. Diverging from previous methodology, a systems-based approach will be employed.

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CARRIER AIRCRAFT FIRE SUPPRESSION SYSTEM

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Presented 13 May 1998 to

Halon Options Technical Working Conference
NMERI

Presented by Bill Leach
NAVAIR Fire Protection Team Lead
NAWCAD Lakehurst

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CARRIER AIRCRAFT FIRE SUPPRESSION PROGRAM

MISSION DESCRIPTION

*TO IMPROVE FIREFIGHTING SYSTEMS
AND FIRE PROTECTIVE MEASURES
FOR AIRCRAFT-RELATED FIRES ON
AIRCRAFT CARRIERS.*

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CARRIER AIRCRAFT FIRE SUPPRESSION PROGRAM

- **Background**
 - Program Was Centered on P-25 Development
 - Recent Halon 1211 Replacement Emphasis
 - ODS Production Restrictions
 - Fixed Strategic Reserve
 - Possible Use Restrictions / Destruction
 - Responsible Use Policy

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- Carrier Use of Halon 1211
 - P-16: 400# (Internal)
 - P-25: No Internal Halon (three 20# portables)
 - Twin Agent Unit: 350# (+ AFFF)
 - Portables: 20# (or CO2 + PKP)

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- Program Focus
 - Existing DOD Program
 - Identify 1211 Replacement for Use in Existing Equipment
 - Extreme Challenge - No Acceptable Solutions Yet
 - Efforts *Or-Going*
 - Carrier Program
 - New Approach
 - Applicable Beyond Carrier Environment
 - *ENHANCES (does not preclude) existing program*

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- Historical Approach
 - “Need” What You Can Fit
 - Quantities Not Based on Defined Fire Threat
- New (Systems) Approach
 - Define and Standardize Baseline Fire Threat(s)
 - Conduct Comprehensive Systems Testing
 - Promote Synergistic Response

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- Progress
 - Halon 1211 Replacement Study
 - I: Development of Alternatives
 - II: Requirements Review
 - III: Reserve Evaluation
 - IV: Program Plan
 - Test Facility Refurbishment

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- Facility
 - China Lake Mini-Deck
 - Resurfaced Deck
 - New O/W Separator
 - New Fuel Tank
 - Wind Generators
 - Flush Deck Nozzle
 - 1st Test Scheduled for Friday

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- Part I: Development of Alternatives
 - Review DOD Efforts Thusfar
 - Equivalent Performance
 - Compatible with Existing Hardware
 - 150# Wheeled Portable Unit
 - No Acceptable Solutions Yet

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- **Part II: Requirements Review**
 - Agent Quantities Not Based on Defined Fire Threat
 - Five Threats
 - Engine (majority of reported incidents)
 - Wheel / Brake
 - Electrical
 - Spill
 - Crash

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- **Part III: Reserve Evaluation**
 - Installed Base
 - Aircraft: 1,000 pounds
 - Ships: 157,000 pounds
 - Facilities: 1,400,000 pounds
 - Mission Critical Reserve
 - Navy/USMC: 450,000 pounds

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- **Part III:**
 - Halon 1211 Usage
 - **Fire Incident Data**
 - 35,000 pounds/year
 - 13 Years of Reserve
 - **Reserve Requisitions**
 - 113,500 pounds/year
 - 4 Years of Reserve

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- **Part IV: Program Plan**
 - **Develop Baseline Fire Standards**
 - Establish Threat Repeatability
 - Apply Integrated Fleet Doctrine/Tactics/Equipment
 - **Test Systems Performance**
 - Fielded Systems
 - COTS
 - Modified COTS

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- **Conclusions**
 - **Difficulty in Defining Urgency**
 - Long Term Halon 1211 Availability?
 - **Clean Agent "Requirement" Verified - But Not Quantified**
 - **Additional Collated Damage Must Be Evaluated**
 - Frequency of Application
 - Cost of Repair

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- **Conclusions**
 - **Promise of Non-Developmental Solution(s)**
 - Based on Systems Approach
 - Agent / Hardware / Tactics
 - **Most Critical Use of Halon 1211: Carrier**
 - Increased Tempo
 - Increased Mission Dependence on Fixed Assets
 - Extreme Potential for Loss