HALON 1211 ALTERNATIVE EFFORTS
One More Time

Presented to:
Halon Options Technical Working Committee (HOTWC)
17 May 2006

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DoN HALON 1211 USES

- Aviation Flightline 150 lb Wheeled Portable Fire Extinguisher (PFE)
  - Predominate Usage (~75%+)
- ARFF Equipment (Installed Systems)
  - Less Significant Usage (~15%)
  - ARFF Vehicles (Shore): 500 lbs/each
    - New Vehicles Use PKP
  - Twin Agent Units (TAU) 200-350 lbs/each
- PFEs (2.5 lbs – 20 lbs)
  - Minor Usage (~5%)
  - Shore Based ARFF Vehicles
  - Shipboard MFFV (P-25)
  - Training & Transport Aircraft
- LCAC
  - Minor Usage (<3%)
  - Critical Weight & Space Req’ts
- C-130J Engine Nacelle
  - Minor Usage (<1%)
DoN HALON 1211 RESERVE

Balance (year end)  Issues  Returns
FLIGHTLINE EXTINGUISHER

• Primary Airfield Extinguishers (150 lbs)
  – Only Extinguisher Available On Most DoN/USAF Flightlines
  – Most Prevalent Halon 1211 Application/Use Within DOD

• First Line of Defense for Aircraft Fires
  – Used Mainly by Aircraft Maintenance Personnel
  – “Sailor-Proof”
    • Easy Operation

• Generally “Overkill” For Most Common Flight Line Fires
  – UL Rated 30A:240B:C

• It’s Clean
  – Allows Mission Continuity, Post “Nuisance” Fires
  – No Collateral Damage
WHY REPLACE HALON 1211?

• DoN Reserve: Nearly Depleted
  – “Taking Donations” From USAF, Army, DLA, etc.
• USAF Reserve: End in Sight
• Largest Remaining “Emissive Use” of Halon
  – Banned in Some European Nations
  – Likely to be Banned by Entire EU in the Future
• No Longer Considered “Essential/Critical” by Some
  – “Banks” Being Destroyed
  – Not Used by Airlines
  – Most Foreign Militaries Have Switched to Alternatives
    • PKP, CAFS, CO₂, etc.
JOINT SERVICE APPROACH

• Air Force Has Agreed to Fill DoN’s Current Needs
  – Inter-Service Cooperation Being Formalized by MOA

• Develop Comprehensive Halon 1211 Alternative Plan
  – Identify Sponsors for Alternate Agent Testing
    ✷ Joint Need ✷ Joint Effort ✷ Joint Sponsorship

• Alternative Projects Funded
  – NDCEE
  – ESTCP
DIFFERENT APPROACHES

• Prior R&D: *Drop-In Approach*
  – Early 1990’s @ Air Force (AFRL Tyndall)
  – Replace Effectiveness of 150# of Halon 1211, *in Same Bottle*
  – Extreme Technical Challenge; Unsuccessful

• NAVAIR Promotion: *Systems Approach*
  – Define Threats (Historical Basis)
  – Construct Representative Fire Scenarios During Testing
  – Identify Agents/Systems Proven to Meet Threat
    • Exploits Fact that *Usually* < 150# is Required
  – Very Limited Application; Successful (if ever required)

• Current Effort: *Mixed Approach*
  – Same Insistence on Agent Equivalence
    • USAF Already Has Some Stakeholder Buy-In
    • Minimum Performance Standard - AFRL-ML-TY-TR-02-4540; May 2002
  – But… No Container Restrictions
    • Allows (if not guarantees) System Growth
    • Going-In Position
PLAYERS

• Navy – Led Joint Program
  – NAVAIR Fire Protection Team
  – SAF/AQRE
  – Test Facility: AFRL Tyndall

• Supporting Navy Organizations
  – CNO N45
  – NAVSEA

• Stakeholders:
  – Fire Departments; Aircraft & Subsystems Program Managers; Engine Program Managers; Logistics Maintenance Organizations; ESOH Professionals; Egonomics/Human Factors Community; etc.
  – Disciplines: Fire Suppression/Extinguishing Performance; Material Compatibility; Material Stability; Material/System Availability; Environmental; System Maintenance; Logistics; Cost; Etc.
## ESTCP PLAN (SUMMARY)

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<th>Schedule</th>
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<td>- Assemble Stakeholders</td>
<td>Mar – Dec 2006</td>
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<td>- Compile (<em>NOT</em> Create) Requirements</td>
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<td>- Gain Formal Stakeholder Acceptance</td>
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<td>- Invite Mature Candidate Agents/Systems</td>
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<th>Task 2: Test Candidate Agents/Systems</th>
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<td>- Dem/Val Against Requirements (<em>NOT</em> S&amp;T)</td>
<td>Jan – Jun 2007</td>
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<th>Task 3: Evaluate, Select, Report</th>
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<td>- Rank Tested Candidates</td>
<td>Jul – Dec 2007</td>
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<td>- Obtain Final Buy-In from Stakeholders</td>
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AGGREGATE REQUIREMENTS

- USAF Minimum Performance Standard
  - AFRL-ML-TY-TR-02-4540; May 2002
  - Currently Undergoing Review/Discussion Within DoN
    - Navy & Marine Corps F&ES Requirements?
- Current Halon 1211 Extinguisher Purchase Description
  - WRALC PD 99LECF02 (19 Feb 99)
  - Specifies Size, Flow Rate, UL Rating, Maintainability, etc.
- Clean Agent Requirements
  - Not Clearly Defined
  - Clean Agent = Halon 1211
- Propulsion Community, Environmental, OSH, Etc.
  - TBD
- Industry Input Welcome (and encouraged)
TESTING

• To Be Conducted at AFRL Tyndall
• Only Testing Planned is Fire Testing
  – All Other “-ilities” Assessed on Contractor Furnished Information
QUESTIONS FOR STAKEHOLDERS

• Who Are the Stakeholders?
  – Multiple Disparate Communities

• What is Clean?
  – Current Requirements for Material Compatibility?
    • Manufacturer Specs/Guidelines
  – How Important is a Clean Agent?
  – What’s Impact of a Dirty Agent?
    • Huge Un-programmed Cost Burden?

• Is USAF MPS Appropriate/Sufficient?
  – Very Conservative: Extreme Fire Challenge Meant to Stress 150# of Halon 1211
  – Does New Extinguisher Need UL 30A:240B:C Rating?
    • Would a Lower Rating Be Acceptable?

• Will Higher Cost of Agent & Extinguisher Be Acceptable?
  – Halon 1211 Unit ≈ $3,150 ($15/lb for Halon + $900 Hardware)
  – Agent “X” Unit ≈ $6,000 - $7,500 (Assumes 300 lbs x $15-$20/lb + $1500 Hardware)
  – Example Base Costs:
    • Combined European Bases ≈ $1.5 - $1.8 M (240+ Extinguishers)
    • Single Master Jet Base ≈ $1.2 - $1.5 M (200+ Extinguishers)
    • Single Small Airfield ≈ $150 – $188 K (25 Extinguishers)
  – Who Pays for Flightline Extinguishers?

• Is 300+ lbs of Agent Acceptable?
  – Are There Any Size/Weight Constraints?
  – Ergonomics, Transportability, Footprint?
  – Is an Option For A Smaller (Less Capable) Extinguisher Desirable?