NASA Space Shuttle Program
Shuttle Environmental Assurance (SEA) Initiative

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Outline

• Background
• SEA Establishment
• Obsolescence Drivers
• SEA Activities
• Issues
• Mitigation Strategies
Background

- First Space Shuttle flight in 1981
- Fleet originally expected to be replaced with a new generation vehicle in the early 21st century
- Current projection is until 2020
- Aging vehicle and systems present obsolescence issues
SEA Establishment

• SSP Program manager created the Shuttle Environmental Assurance Initiative in 2000

• SEA is to provide an integrated approach for the SSP to:
  ▪ promote environmental excellence,
  ▪ proactively manage materials obsolescence, and
  ▪ optimize associated resources.

• SEA membership is comprised of representatives from the SSP Elements, Integration, Space Flight Operations Contract, SSP Contractors, and other NASA Organizations

Obsolescence Drivers and SEA Issues

Obsolescence Drivers:
• Vendor Economics
• Industrial/Safety Hazard
• Natural Disaster
• Obsolescent Technology
• Government Regulations (EPA, OSHA, State)

SEA Issues:
SEA issues present risk to the SSP, and are environmentally-driven or require material re-qualification.
SEA Work Areas

- Facilitation/Communication
- Issue Management
- Emerging Regulations
- Interfaces
- Resources
- Documentation

Issue and Risk Management Process

- Identify
- Analyze
- Plan
- Mitigate
- Track
- Control
### Regulatory Assessments

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### Interfaces

**NASA**
- Materials Replacement Technology Team (NMRT2)
- Acquisition Pollution Prevention (AP2)
- Headquarters Code JE
- Environmental Management Offices (EMOs)
- EEE Parts Working Group
- Workmanship Technical Committee
- SSP Integrated Logistics Panel

**Joint Group on Pollution Prevention**
- NASA/Air Force/Army/Navy/Defense Contract Management Agency

**Department of Defense**
- Air Force
- United States Environmental Protection Agency (EPA)
## SEA Issues

### Alternate Solvents
- Trichloroethane (TCA) Elimination (SSV Use)
- Trichloroethane (TCA) Elimination (RSRM Use)
- Chemical Paint Stripper Alternatives

### Alternate Coatings, Inks, and Finishes
- High Volatile Organic Compounds (VOC) Coatings
- Hypalon Paint Replacement
- Hexavalent Chromium Replacement: Conversion Coating
- Hexavalent Chromium Replacement: Alkaline Cleaners
- Hexavalent Chromium Replacement: Primers
- Alternate Dry Film Lubricant (Lube-Lok)

### Alternate Foams
- HCFC 141b Blowing Agent

## Issues Across Shuttle Elements

### Space Shuttle Vehicle
- Paint stripper alternatives
- Chromium replacement
- HCFC 141b blowing agent
- High VOC coatings
- TCA elimination

### External Tank
- Chromium replacement
- HCFC 141b blowing agent
- High VOC coatings

### Solid Rocket Boosters
- Chromium replacement
- HCFC 141b blowing agent
- High VOC coatings
- Alternate dry film lubricant
- Hypalon paint

### Reuseable Solid Rocket Motors
- Chromium replacement
- High VOC coatings
- Hypalon paint
- TCA elimination
### Mitigation Strategies

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