EPA'S PROGRAM FOR HALON REPLACEMENT

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Protecting the Ozone Layer

- 2001 Antarctic ozone hole spread over 10 million sq. miles
- Predictions for recovery in 50 years
- Depends on continued reductions in ozone depleting substances
EPA’s Program for Halon Replacement: Overview

- EPA authority and halon regulations
- SNAP program on alternatives
- EPA/Industry partnerships
- Other cooperative activities
EPA Authority

• Montreal Protocol on Substances that Deplete the Ozone Layer (1987)
  – US is a party
  – approx. 170 nations have ratified

• Title VI of the 1990 Clean Air Act (CAA)
  – establishes controls on chemicals contributing to ozone depletion including CFCs and halons
Halon Regulations

- 1994 phaseout of production and import
- Labelling rule
- SNAP program
  - Updates to SNAP listing of alternatives
  - New rule adopting NFPA 2001 standard for clean agents
- Halon emissions reduction rule
- Upcoming ban on Halon 1011 production and import
SNAP Background

• CAA Section 612 directs EPA to evaluate and list substitutes for ozone depleting substances (ODSs) that reduce overall risk to human health and the environment

• Alternatives include:
  – Chemical replacements
  – Product substitutes
  – Alternative technologies
SNAP Background (continued)

- SNAP considers:
  - Ozone depletion potential (ODP)
  - Global warming potential (GWP)
  - Toxicity
  - Flammability
  - Other environmental impacts

- ~270 substitutes reviewed across 8 industrial sectors
Achievements of SNAP Program

• Health/safety and environmental benefits
  – Controlled workplace exposures to new chemicals
  – Improved health risk assessment models (PBPK model, aerosols risk screen)
  – Responsible use of global warming gases
  – Control over flammability risks
  – Alternative technologies reduce aggregate chemical use
Types of Decisions under the SNAP Program

• Acceptable
• Acceptable subject to use conditions
  – ex. Must meet egress times if halocarbon fire suppressants are discharged
• Acceptable subject to narrowed use limits
  – ex. Use perfluorocarbons only if reasonable efforts determine no other alternatives feasible
• Unacceptable
Safety Guidelines: Based on Cardiac Sensitization

Where is there a health effect?
No effect?

How does this relate to humans?
NFPA 2001 Standard Exposure Guidelines

- NFPA standard 2001 was developed since original SNAP rule, and has recently been updated:
  - For halocarbons, includes the use of data from a PBPK model to establish exposure limits
  - For inert gases, includes the findings of an expert panel on health effects of low oxygen atmospheres
Significance of New SNAP Rule

• Uses a new scientific tool, the physiologically-based pharmokinetic (PBPK) model to determine safety guidelines
  – More precise than current approach
  – Makes alternatives easier to use
• Coordinates with industry standard
• Simplifies SNAP listings
• Adds new alternatives
New SNAP Rule

• EPA will replace the SNAP conditions for exposure limits and times for halocarbon and inert gas substitutes
• SNAP listings will refer to NFPA 2001
• EPA will continue to review and list halon substitutes, and to evaluate them based on overall risks to:
  – Human health
  – Environment
Upcoming Listings

• Acceptability listing for Halotron II in total flooding
  – Only for normally unoccupied areas
• Acceptability listing for Envirogel in total flooding in occupied areas
  – For ammonium polyphosphonate additive
  – Previously listed for areas that are normally unoccupied only
• Delisting HBFC-22B1
Tentative Timeline for New Rule

- OMB began review of direct final rule package this summer
  - Rescind rule
  - New listings
- Publication in Nov/Dec
- If no adverse comment - final in 60 days
Pending Submissions for Halon Replacements

- Total Flooding Agents
  - Novec 1230
  - H Galden HFPEs
  - Goodrich 244
  - FM-200 + NaHCO3

- Streaming Agents
  - Novec 1230
  - H Galden HFPEs
EPA/Industry Partnerships

• Voluntary Programs to minimize emissions of high global warming gases
  – Responsible use principles for HFCs and PFCs
  – Innovative technologies
  – New alternatives

• EPA partners:
  – Semiconductors
  – Aluminum
  – Magnesium
  – Electric power systems
  – Refrigerant manufacturers
EPA/Industry Partnerships (continued)

• Halon Alternatives Research Corporation (HARC) and EPA working to develop Voluntary Code of Practice for halon substitutes
Coordinating within the Federal Government

- Federal Aviation Administration
  - Testing of alternatives
  - Safety in airplane cargo holds
- Department of Defense
  - Finding and testing alternative agents
- US Coast Guard
  - Standards on safety for sea vessels
Coordinating with Other Organizations

• Industry associations
  – Fire Suppression Systems Association
  – HARC and the Halon Recycling Corporation (HRC)

• Codes and Standards
  – National Fire Protection Association
  – International Maritime Organization
  – International Standards Organization
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For More Information

• EPA Ozone Depletion Web Site
  http://www.epa.gov/ozone/

• Stratospheric Ozone Hotline
  1- 800-296-1996
  (301) 694-3396 in D.C. area

• EPA Air Docket A-91-42
  (202) 260-7548