EPA'S NEW REGULATORY PROGRAM FOR EVALUATING CFC AND HALON SUBSTITUTES

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ABSTRACT

The Clean Air Act Amendments (CAAA) of 1990 require the U.S. Environmental Protection Agency (EPA) to phase out production of ozone-depleting chemicals, including the halons. Under the existing provisions of the CAAA, the halons are scheduled for phaseout by the year 2000; however, recent scientific evidence of continued ozone depletion has supported current efforts to accelerate the phaseout by several years.

The CAAA also require EPA to examine and either approve or disapprove chemicals and associated processes proposed as replacements for chemicals being phased out. Section 612 specifically requires: (1) EPA to promulgate a rulemaking will prohibit the use of substitutes that pose adverse impacts on human health and the environment, (2) EPA notification at least 90 days before the introduction of substitutes (either existing or new) as replacements for ozone-depleting chemicals, (2) publication of a list of prohibited and acceptable alternatives, and (3) establishment of a process by which the public can petition EPA to add or delete substitutes from the unacceptable list. This new regulatory program, referred to as the Significant New Alternatives Policy (SNAP) Program, must be promulgated by November 15, 1992. Currently, EPA is drafting the regulation to implement the SNAP program process, as well as conducting risk assessments by substitute and application to develop an initial list of reviewed substitutes. The latter activity is particularly important given the current activities to accelerate the phaseout date.

The presentation will describe the SNAP program in more detail and discuss how various criteria will be used to evaluate substitutes. The key criteria comprise human toxicity, exposure (consumer, worker, and general population), ozone depletion, global-warming potential, flammability, and economics. The presentation will then focus on the halon alternatives being examined by EPA, the general issues that are arising in context of EPA's review of these substitutes, and some (if possible) preliminary decisions regarding the acceptability of several halon alternatives. The presentation will conclude with an overview of next steps, including discussion of the remaining regulatory schedule for the SNAP program

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Outline of Presentation

- Clean Air Act Requirements
- Significant New Alternatives Policy (SNAP) Program
- Halon Assessment

Title VI: Major Sections

Section 604 & 605:	Phaseout
Section 608:	Emission reduction and recycling
Section 609:	Mobile air conditioning (MACs)
Section 610:	Nonessential uses
Section 611:	Labeling
Section 612:	Safe alternatives

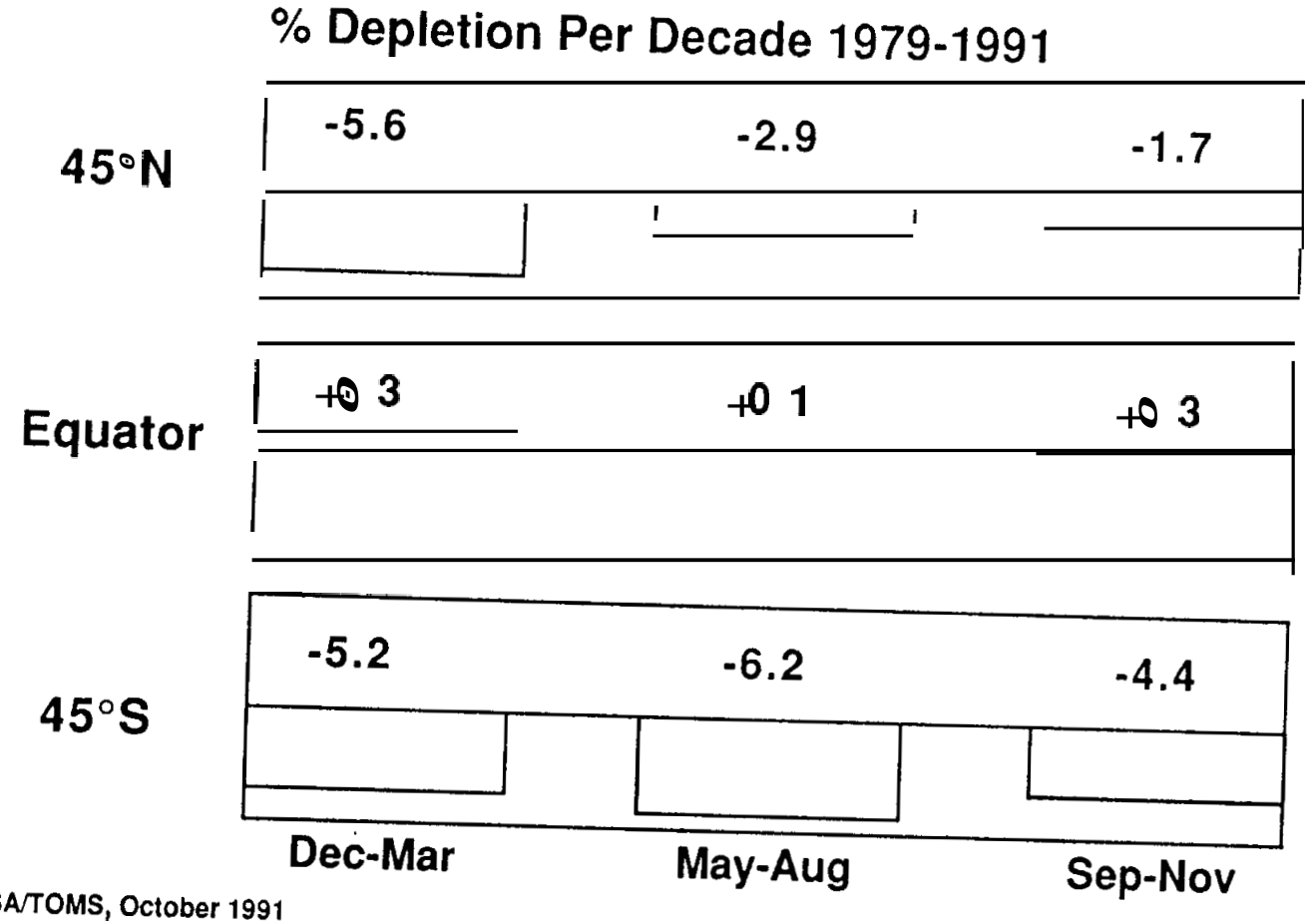
Phaseout of Halons

Substance	Formula	ODP *
Halon 1211	CF_2ClBr	4
Halon 1301	CF_3Br	16
Halon 2402	$C_2F_4Br_2$	7

*UNEP Assessment, 199

Originally, phaseout of production by 2000 under the Clean Air Act Amendments of 1990

Most Recent Findings on Ozone Depletion



Source: NASA/TOMS, October 1991

New Science

- **Pre-1987:** no ozone depletion until the middle of next century (based on modeling results)
- **1987-1990:** a 3 to 5 percent decrease between 1969 and 1988 in northern hemisphere (based on monitoring data)
  - ozone hole over Antarctica
- **1991:** ozone depletion has occurred twice as fast over last 10 years in northern hemisphere
- **Implications:**
  - more international pressure to phase out in 1997
  - more controls on HCFCs?

President's Announcement to Accelerate the Phaseout

On February 11, 1992, President Bush announced that:

- The US will phase-out production of Class I substances by the end of 1995 rather than by the year 2000.
- The US will re-examine the phaseout schedule for Class II substances.

Safe Alternatives Policy: Requirements

- By November 15, 1992, EPA must issue rules making it unlawful to replace any Class I or Class II with an unacceptable substitute
- EPA must publish a list of prohibited substitutes by use sector
- EPA must establish a petition process
- 90-day notification is required prior to the use of any new or existing substitute as a significant alternative

Definition of Substitute

- "...chemicals, product substitutes, or alternative manufacturing processes that reduce overall risks to human health and the environment"
- Substitutes may be existing or new
- Substitutes may be "currently or potentially available"

Decision Making Under SNAP

Risk Assessment → **Risk Management** ← **Petition Process**

- To assess "overall risks to human health and the environment"
- Sector/use specific
- Existing/potentially available substitutes

- Listing of unacceptable substitutes
- Corresponding list of acceptable substitutes
- Sector/use specific

90-day review

- To add or delete substances from unacceptable list

Key Risk Assessment Criteria

- Chlorine, Bromine loadings
- Ozone-depletion potential
- Total global-warming potential
- Flammability
- Chemical toxicity
- Exposures
  - air, water, hazardous/solid waste
  - worker, consumer, general population, aquatic organisms

Key Assessment Criteria (Continued)

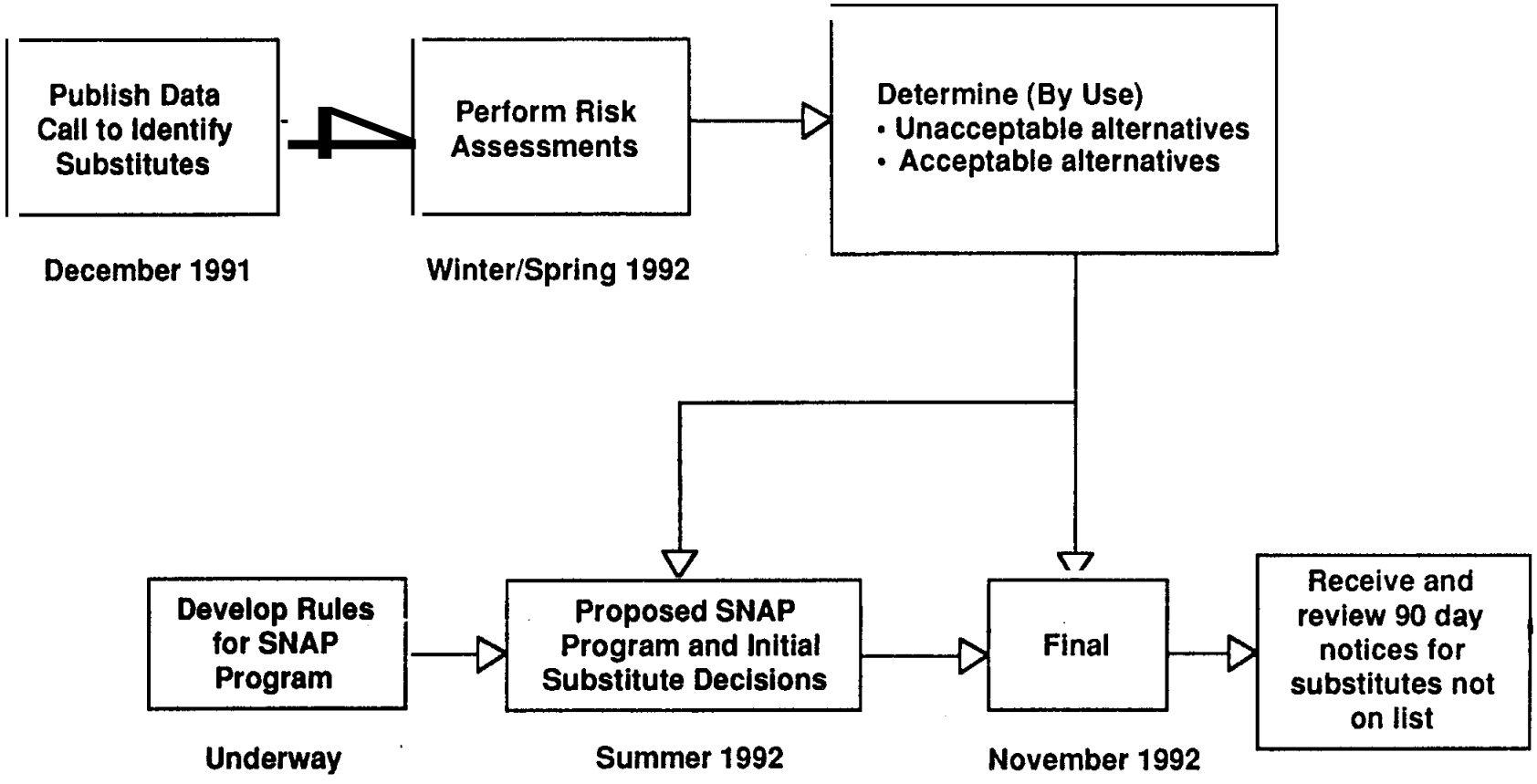
Costs

- **Substitute chemicals**
- **Capital expenditures**
- **Operating (including energy costs)**
- **Avoided costs for meeting environmental regulations**

Risk Management Goals

- Evaluate substitutes
  - by use
  - in context of risks they are replacing
  - compared to other available substitutes
- Prohibit only those alternatives that are significantly worse
- Include consideration of economic feasibility

SNAP Timeline



Near Term Replacements

HBFCs	HCFCs	HFCs	PFCs	Proprietary
HBFC-22B1	HCFC-22	HFC-23	FC-3-1-10	NAF S-III
	HCFC-123	HFC-32	FC-5-1-14	NAF P
	HCFC-124	HFC-125		Halotron I
		HFC-134a		
		HFC-227ea		

Comparison of Near-Term Replacements (By Class)

Agent	Benefits	Concerns
HBFC	Fire-extinguishing capability.	ODP; Toxicity (may not be acceptable in occupied areas); Addition of 1201 as a Class 1 substance.
HCFC	Lower ODP than HBFCs (though still non-zero).	Less effective than halons, HBFCs; Decomposition products; Toxicity of HCFC-123: Phaseout.
HFC	ODP= 0; Explosion inertion capability.	Less effective than halons, HBFCs in fire suppression; GWP of HFC-125; Decomposition products.
PFC	ODP = 0; Low toxicity.	Long atmospheric lifetimes (GWP); Less effective than halons.

Comparison of Alternatives Agents

Agent	Benefits	Primary Concerns
Water	Effective against Class A and B fires; Non-toxic.	Use with electrical equipment; Secondary damage.
Foam	Effective against liquid fires; Low toxicity.	Use with electrical equipment; Secondary damage; Low expansion foams ineffective against 3-D fires.
Dry chemicals	More effective than halons in many applications.	Penetration; Secondary damage; No inertion
Inert Gas	Clean; Penetration.	Asphyxiation; Required concentration; Toxicity of CO_2

Key SNAP Issues: Halons

- Can HCFC-123 be used safely and effectively as a fire suppressant?
- Should the primary SNAP decision focus on the toxicity of the fire-fighting agent?
- How should substitutes that have long atmospheric lifetimes be treated?

Next Steps: Halon Assessment

- Complete Risk Assessments
  - representative use scenarios
  - size of use sectors, penetration of substitutes
  - exposure and atmospheric analyses
- Make Risk Management Decisions
  - suitability of substitutes by sector
  - listing of acceptable/unacceptable substitutes
- Outreach
  - industry, trade groups
  - computer databases