



NASA PRINCIPAL CENTER FOR REGULATORY RISK ANALYSIS AND COMMUNICATION

Mission Risk Reduction Through Regulatory Change Management

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Topics

- **Principal Center Overview**
- **Regulations Can Drive Program Risk**
- **Regulatory Communications Process**
- **Examples of Current Regulatory Activities**





RRAC PC Overview

- **RRAC PC Goals**
 - Proactively detect, analyze and communicate environmental regulatory risks to NASA Programs and Facilities
 - Negotiate and participate in the mitigation of such risks, including facilitating communication with regulatory agencies on behalf of NASA Programs
 - Provide centralized support to NASA HQ Environmental Management Division (EMD)
- **Leadership**
 - RRAC PC Lead: Sharon Scroggins/MSFC EEOH (AS10)
 - ❖ *Support Contractor: CH2M HILL*
 - RRAC PC HQ Sponsor: David Amidei/HQ EMD





Risks posed by the Program to the environment

- Identified under NEPA through the Environmental Impact Statement (EIS) process **prior to Program inception**
- The EIS describes programmatic options and addresses environmental considerations associated with each, usually in a one-time effort

Risks posed to the Program by environmentally-related drivers

- On-going effort through the life of the program
- Risk to program grows with time due to changes in laws and regulations





Regulations Can Drive Program Risks

Changing regulations have the potential to affect program activities directly and indirectly

- **Can restrict certain activities or processes; for example:**
 - Changes in how operations may be done
 - ❖ *High-efficiency spray equipment*
 - ❖ *Quantities of thinner allowed for coating application*
 - Limitations on where or how operations can take place
 - ❖ *In spray booths rather than “in the field”*
 - ❖ *Require dipping or brushing instead of spraying*
 - Changes to protective equipment requirements
- **Can affect availability and usage of materials; for example:**
 - Production phase-out or restriction of usage applications
 - ❖ *ODSs, brominated flame retardants, and others*
 - May require material replacement efforts
 - ❖ *Replacement costs; potential schedule impacts; potential performance variance*
 - Formulation changes by vendors to critical materials and/or components
 - ❖ *Despite contractual notification clauses, can happen without notification*





Regulatory Communications Process **RRAC PC Regulatory Communication**

- **Regulatory communication takes many forms:**
 - **Communicate regulatory change to NASA Community**
 - ❖ *Regulatory update presentations to management*
 - ❖ *Technical working group participation*
 - Constellation and Shuttle Program Working Groups
 - JANNAF Propulsion meetings
 - Interagency Working Groups
 - etc.
 - ❖ *Regulatory alerts and special reports*
 - Regulatory posture of specific materials
 - Operational impact analyses of specific regulations
 - etc.
 - ❖ *Biweekly regulatory summary*
 - Federal and State actions
 - Other significant developments and news
 - **Solicit feedback from NASA Programs and Facilities on potential impacts from emerging regulatory changes**
 - **Communicate potential issues to regulatory agencies**
 - ❖ *Lead and facilitate negotiations for exemptions and other considerations from EPA*
 - ❖ *Assist EPA and other agencies in rule development activities*

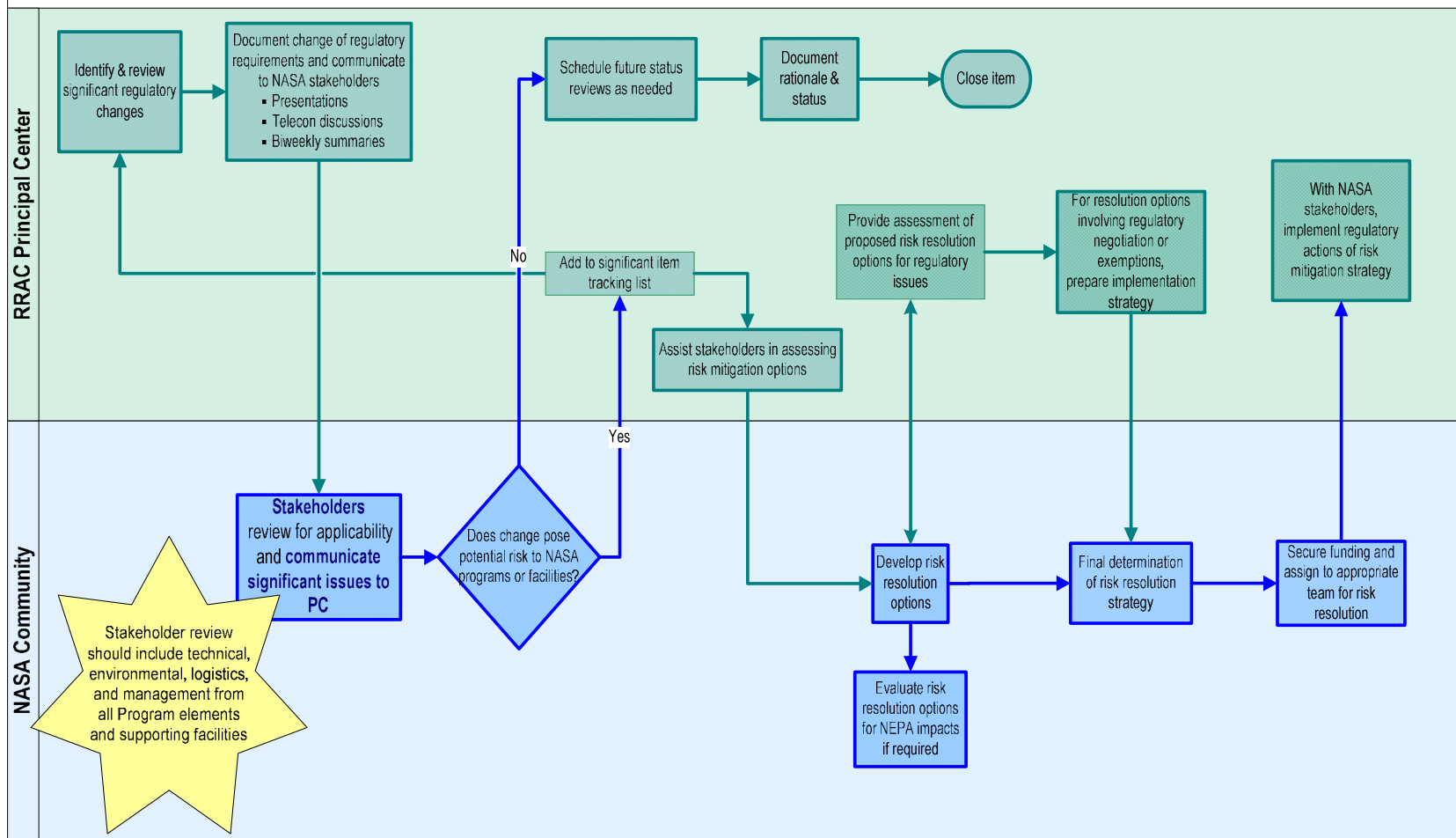




Regulatory Communications Process

RRAC PC Program Support: "Swim Lanes"

NASA Regulatory Risk Communications Process





Examples of Current Regulatory Issues **Ozone Depleting Substances**

- **Being phased out with varying requirements and schedules; many are no longer in production**
- **Several ODSs are still used in critical applications on space vehicle systems, including:**
 - TCA (1,1,1-trichloroethane, methyl chloroform)
rubber activation and bonding; precision cleaning
 - HCFC 141b
blowing agent in foam insulation.
 - HCFC 225
precision cleaning and cleanliness verification; LOX systems
 - Halon 1301
fire extinguishing





Examples of Current Regulatory Issues

Global Warming and Greenhouse Gases

- **The U.S. Supreme Court has ruled that EPA has authority under the CAA to regulate carbon dioxide and other greenhouse gas (GHG) emissions**
 - [*Massachusetts v. EPA – 2 April 2007*](#)
- **Other Federal legislative initiatives could limit availability of greenhouse gases, including HFC 134a and HFC 245fa**
 - Numerous climate-related bills have been introduced in the US Congress
 - ODSs are also GHGs
- **Several US states are establishing state greenhouse gas reduction programs**
- **European Union initiatives may affect materials availability and suppliers' formulations**





Examples of Current Regulatory Issues

Hazardous Air Pollutants

- **Aerospace NESHAP**
 - Currently being reviewed for effectiveness; covers coating, cleaning and paint stripping operations on flight hardware
- **DLSME NESHAP**
 - Under development; will cover coating, cleaning and paint stripping operations on ground support equipment and other non-flight hardware located on NASA facilities
- **Area Source Rules**
 - Numerous rules will affect facilities other than KSC and MSFC, including contractor and sub-tier vendor facilities





Examples of Current Regulatory Issues

Others

- **OSHA Exposure Limits**
 - OSHA recently lowered the exposure limit for hexavalent chromium; increased regulatory burden and physical requirements for some operations involving hexavalent chromium
 - Other exposure limits to be considered include beryllium, crystalline silica, and others
- **European Union**
 - Reduction of Hazardous Substances (RoHS) regulation helped drive world-wide replacement of lead in solder and electrical finishes
 - Registration, Evaluation, and Authorisation of Chemicals will address over 30,000 chemicals; could potentially drive widespread replacement of hexavalent chromium and other carcinogens, as well as limit usage of many other substances.





For More Information

If you have further questions and/or need assistance, please contact:

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Back Up Information





Acronyms and Abbreviations

CAA	Clean Air Act
CFC	Chlorofluorocarbon
DoD	Department of Defense
EIS	Environmental Impact Statement
E.U.	European Union
EPA	U.S. Environmental Protection Agency
ET	External tank
GHG	Greenhouse gas
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
lbs/yr	Pounds per year
LOX	Liquid oxygen
MSFC	Marshall Space Flight Center
NASA HQ	National Aeronautics and Space Administration Headquarters
NEPA	National Environmental Policy Act
ODS	Ozone depleting substance
OSHA	Occupational Safety and Health Administration
RRAC PC	NASA Principal Center for Regulatory Risk Analysis and Communication
RSRM	Reusable solid rocket motor
SSP	Space Shuttle Program
TCA	1,1,1-Trichloroethane
TSCA	Toxic Substances Control Act
TPS	Thermal Protection System

