U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Overview of the U.S. Nuclear Regulatory Commission's Initiatives on the Use of Cesium-137 Chloride Sources

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Use of CsCl Sources

- Primary Applications
  - Blood irradiators
  - Research irradiators
  - Calibrators
- Use of Cesium-137 Chloride (CsCl)
  - Ideal energy spectrum (670 keV)
  - Long half life (30 years)
  - Readily available
- Materials Properties
  - Currently in compressed powder form
  - Highly soluble
  - Highly dispersible

Gammacell 40 irradiator

Gammacell 1000 Elite Irradiator

J.L. Shepherd - Category 1 Irradiator

J.L. Shepherd Calibrator

Hopewell Designs, Inc. calibrator

Current Status

- The security and control of radioactive sources has been significantly enhanced
- Integrated and comprehensive program is in place for management and control of radioactive sources
- Risk-informed requirements are in place to ensure security (Large Irradiators, Manufacturers/Distributors, Transportation, Increased Controls, and Fingerprinting)
- NRC continues to work closely with domestic and international partners to improve security

History of NRC's CsCl Work

2005 The Energy Policy Act of 2005

- Radiation Source Protection and Security Task Force is to be established
- NRC is to fund a study by the National Academy of Science

2006 Task Force 1st Report issued

2008 National Academy study completed

2008 CsCl Working group report completed

2008 Public Workshop on the use of Cs-137

2010 Task Force 2nd report issued

2010 Draft Policy Statement published in *Federal Register*

2010 Nov. 8-9: Public Meeting on Draft Policy

Task Force Objectives

- Primary vehicle for advancing source security issues across the Government
- Identify gaps, overlaps, inconsistencies or weaknesses in current programs
- Provide recommendations related to security of radiation sources in the U.S. from potential terrorist threats, including acts of sabotage, theft, or use of radiation source in a radiation dispersal device (RDD)

2006 Task Force Report

- Conclusions:
  - No significant gaps that are not already being addressed
  - Current framework provides reasonable assurance that risk-significant sources (Category 1 and 2 sources) in use and storage are safe and secure through inspection and enforcement
- 10 Recommendations
- 18 Actions

2008 CsCl Working Group Report

- Immediate phase-out would not be feasible
- Step-wise phase-out could be feasible
- Challenges would have to be overcome
- Sufficient time would be necessary for replacement technologies to be established and for disposal pathways
- Sequences and time-frames would be critical
- Interim security measures are important

2010 Task Force Report

- Shorter, more concise (accessible as ML102230141)

- Four main topical areas/chapters:
  - Coordination and communication
  - Advances in the security and control of radioactive sources
  - Status of recovery final disposition of radioactive sources
  - Progress in the area of alternative technologies

- 11 recommendations
  - 4 directly related to CsCl sources (#’s 3, 4, 10, 11)
  - 1 indirectly related to CsCl sources (# 9)

2010 Task Force Report: Cs-137 Recommendations

- Recommendation 3: discontinue licensing exports (contingent on disposal capacity, alternative technologies, threat)
- Recommendation 4: continue evaluation of disposal options, including handling large number of CsCl sources
- Recommendation 10: investigate options for voluntary use of alternative technologies with initial focus on CsCl sources
- Recommendation 11: review discontinuation of licensing CsCl sources (contingent on alternatives and threat)
- Recommendation 9 (indirectly related): support research and development for alternative technologies

2010 Draft Policy Statement

- Published in the Federal Register (75 FR 37483), June 29, 2010:
  - to solicit public input
  - to announce a public meeting November 8-9, 2010

- 7 major statements

- discussion of specific issues:
  - Security and control of sources
  - Areas use
  - Disposal
  - NRC's perspectives on further security enhancements

2010 Public Meeting

- Issues for discussion were published in 2nd *Federal Register* Notice (75 FR 60149), June 29, 2010
- 6 technical issues
- Announcement of date and location

2010 Public Meeting Issues

1. The safety and security of risk significant sources is an essential part of the NRC's mission. Licensees have the primary responsibility to securely manage and to protect sources in their possession from misuse, theft, and radiological sabotage.

2. Adequate protection of public health and safety is maintained if CsCl sources are managed in accordance with the security requirements of the NRC and the Agreement States. NRC monitors the threat environment and maintains awareness of international and domestic security efforts. If changes in the threat environment necessitate regulatory action, the NRC is ready to issue additional security requirements to apply appropriate limitations for the use of CsCl in its current form.

3. Could hardware improvements be made that would further mitigate or minimize the radiological consequences?

Public Meeting Issues (cont'd)

4. The development and use of alternative forms of cesium-137, while not required for adequate protection, is prudent and the NRC intends to monitor these developments closely.

5. CsCl enables three specific classes of applications that benefit society:(a) blood irradiation, (b) bio-medical and industrial research, and(c) Calibration of instrumentation and dosimetry.

6. The NRC recognizes that currently there is no disposal capability for such commercial sources. The NRC considers it imperative to develop a pathway for the long term storage and disposal of these sources whether or not there are alternatives developed.

2010 Public Meeting Participation

- Date: November 8-9, 2010
- Location: The Universities at Shady Grove Conference Center, 9630 Gudelsky Drive, Rockville, MD 2085
- Attendance:
  - Panelists
  - Participants
- All relevant information continually posted:
  http://www.nrc.gov/materials/miau/licensing.html#cc

2010 Public Meeting Contacts

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CsCl Source Security

- CsCl sources are widely used and safely secured in medical, industrial, and research applications
- Several initiatives have been implemented already to improve security of these sources
- Strengthening domestic/international collaboration is a top priority for further enhancing security of CsCl sources
- Publication of the final Policy Statement on the use and protection of CsCl sources is scheduled for 2011