



ORS

Office of Radiological Security

Protect • Remove • Reduce

Permanently Reducing the Risk of an RDD Through Alternative Technology

World Institute of Nuclear Security
Workshop

March 2018



Global
Material
Security



MISSION: The Office of Radiological Security enhances global security by preventing high-activity radioactive materials from use in acts of terrorism.

PROTECT

PROTECT radioactive sources used for vital medical, research, and commercial purposes



REMOVE

REMOVE and dispose of disused radioactive sources



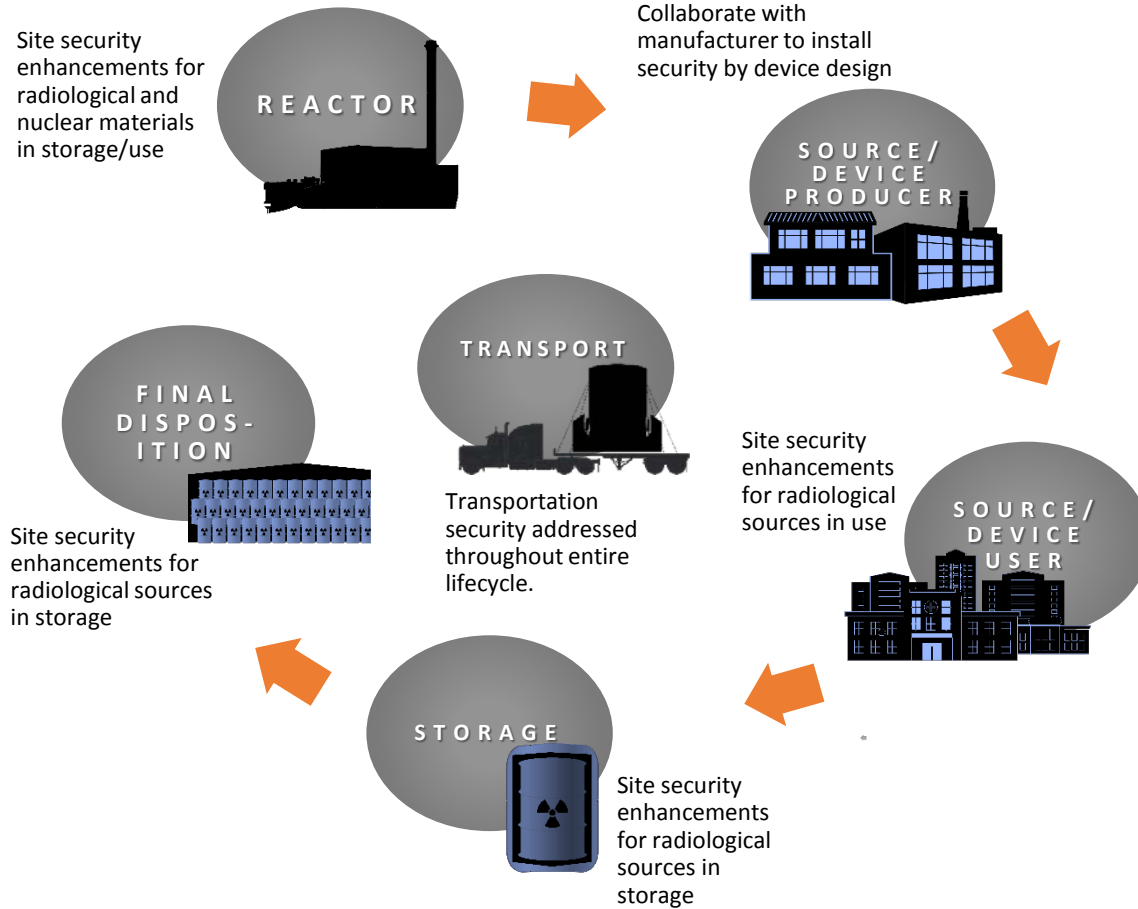
REDUCE

REDUCE the global reliance on radioactive sources by promoting the adoption and development of non-radioisotopic alternative technologies



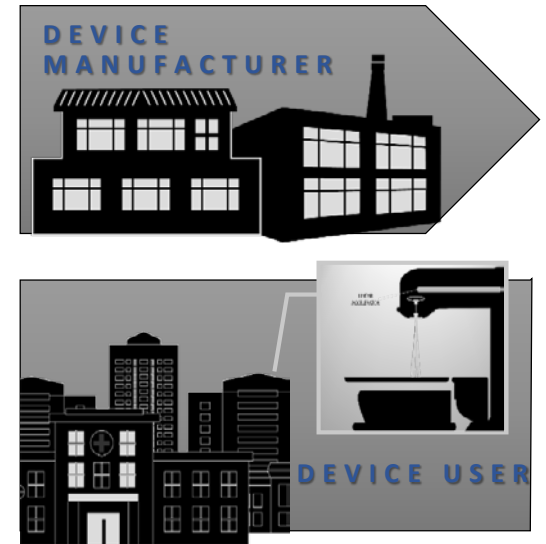
Holistic Approach to Source Security

SECURITY THROUGHOUT RADIOLOGICAL SOURCE LIFECYCLE



ALTERNATIVE NON-RADIOISOTOPIC TECHNOLOGIES

The use of non-isotopic technologies negates the need for security and disposal requirements and eliminates the risk that radioactive sources will become orphaned



Alternative Technologies for High-Activity Radioactive Sources

ORS promotes the adoption and development of non-radioisotopic alternative technology to achieve **permanent risk reduction** by reducing or eliminating risk-significant radioactive materials.

Isotopes of Concern for ORS

- Cesium-137
- Cobalt-60
- Americium-241
- Ir-192

Commercially available, non-radioisotopic alternatives exist for most of the major applications of high activity radioactive materials.

- Blood & Research Irradiation
- Radiotherapy
- Industrial Sterilization
- Radiography
- Well Logging*

Strategic Approach



ORS International Reduce Activities

Implementation

- Cs-137 irradiator replacement (GCSI)
- Co-60 Teletherapy removals
- IAEA– Technical Cooperation projects

Outreach

- NGO and/or professional association workshops and meetings
- Reports and other products to be shared with interested stakeholders
- Bilateral meetings with country partners

Research

- IAEA – Nuclear Sciences & Applications research and Member State analytical support (e.g., Dosimetry Lab)
- Industry engagement to understand state of technology & gaps for research

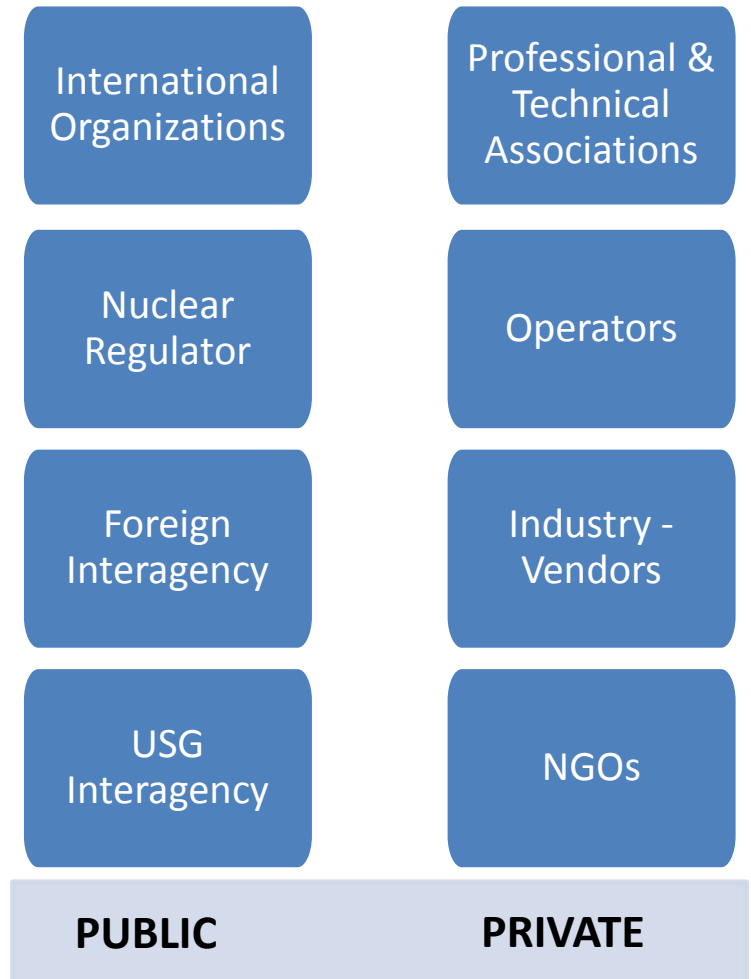
Policy

- Multilateral working group with 22 IAEA Member States on Alternative Technology
- Interagency coordination on relevant USG & international policy documents

ORS Reduce: Partners Overview

Multiple stakeholders are key to a comprehensive, alternative technology approach that balances security, operational, and technical needs.

USG Interagency: DOE, HHS/NIH, DHS, DOS, EOP, EPA, FBI, FDA, NIST, NRC, USDA, VA	GARS Working Group, DHS-Led CIPAC working group, Task Force on Radiation Source Protection and Security
IAEA	Ad hoc Alternative Technology Working Group, Funding for technical research/implementation projects
WHO, World Bank	Participation in IO meetings, informal outreach
GP, UNICRI, GICNT	Informal outreach via HQ channels, some overlap with CBRN topics and alt tech
HPS, AAPM, AABB	Participation in industry-open federal working groups, attendance at prof. conferences
WINS, CNS, NTI	Co-sponsoring/attending workshops and supporting publications of rad security and alt tech-related topics



Cesium Irradiator Replacement Project (CIRP)

CIRP is a voluntary initiative offering financial incentives to licensees who choose to replace Cs-137 irradiators with alternative, non-radioisotopic technologies.

Incentives include:

- Removal of the cesium device through Off-Site Source Recovery Program (OSRP)
- Financial incentive towards the purchase price of a source-free machine
 - Payable upon procurement of the X-ray *and* disposition of the Cs-137 device.

Benefits of Irradiator Replacement

- Reduced security procedures, requirements, costs
- Elimination of terrorism risk—and potential liability
- Avoids complicated and costly disposition at end-of-life
 - No low level or Greater than Class C waste
- Steady and potentially increased device throughput—no source decay
- Some X-ray irradiators have additional capabilities



- CIRP removals: 30 irradiators to date
- Additional removals in the pipeline (contracted or pledged): 80 irradiators



**New
York
City**

- Working with the NYC regulator and the Nuclear Threat Initiative
 - Four workshops or events on radiological security and irradiator replacement since 2015
 - Press conference in October 2017
- Up to 32 irradiator replacements at 14 sites



**University
of
California**

- Working with the University President's Office, the regulator, and the Nuclear Threat Initiative
 - Two workshops on radiological security and irradiator replacement in 2017
- Around 14-22 device replacements across the UC complex of 10 campuses and 5 medical centers

Many countries are using or transitioning to non-radioactive source-based alternative technologies.



- Cobalt-60 teletherapy to LINACs
- Cesium-137 Blood Irradiation to X-ray blood irradiation

Increasing recognition of alternative technologies as part of a comprehensive approach to radiological security.



- Nuclear Security Summit commitments
- IAEA Nuclear Security Series, Conference Reporting, & Speeches

Continued complex challenges: access to reliable maintenance, technical capabilities, and resources for implementation.



- R&D – more robust & improved technology
- Increased focus on training & capacity-building

Ad hoc Alternative Technology Working Group

- Fourth Meeting of the Ad Hoc working group on Alternative Technologies to High Activity Radioactive Sources
- **June 14, 2018** at the Vienna International Centre on the margins of the International Atomic Energy Agency's (IAEA) meeting on the Code of Conduct on the Safety and Security of Radioactive Sources.
- Provides a forum for States that are interested in sharing information and experiences with alternatives to high-activity sealed radioactive sources
- Representatives welcome from any interested country

Thank you!

Malika Taalbi

Office of Radiological Security

US DOE/NNSA

Malika.taalbi@nnsa.doe.gov



Global
Material
Security

