

Reducing Radioactive Materials

Viable Alternative Technologies for Permanent Risk Reduction

The Office of Radiological Security (ORS) enhances global security by preventing high-activity radioactive materials from being used in acts of terrorism. One strategy ORS employs to achieve this mission is to reduce global reliance on high-activity radioactive materials by promoting the development and adoption of non-radioisotopic alternative technologies.

Working with international, federal and state governments, industry, and other key stakeholders, ORS is currently focused on replacement options for cesium-137, cobalt-60, americium-241, and iridium-192 due to the higher risk associated with these materials as well as the number of sources in use.

Alternative Technology Overview

Radiological materials play a critical role in medical, industrial, and commercial applications. The maturation of technology has led to the availability of non-radioisotopic alternative technologies for some of these applications. Certain alternative technologies can work as well or better than the equipment and sources being replaced. The benefits to device users of non-radioisotopic technologies include:

- Mitigation of security risks and costs associated with radioactive sources.
- Avoiding end-of-life disposal challenges of radioactive sources.
- Elimination of liability risk associated with radioactive sources.
- Consistent performance over the lifetime of alternative devices, versus declining radiation output in high-risk radioactive devices.

ORS Reduce Initiatives

ORS works with its partners to achieve permanent risk reduction by leading efforts to support the adoption and development of alternative technologies, therefore reducing the need for the most common devices that use high-activity sources. ORS is currently engaged in efforts both domestically and internationally to exchange technology information, invest in and encourage improvement of technologies, understand and reduce obstacles preventing radioisotopic device replacement, and promote the transition to alternative technologies where feasible. Highlights of current ORS initiatives include the following:

- The Cesium Irradiator Replacement Project provides qualified sites in the United States who are interested in replacing their cesium irradiator with non-radioisotopic alternative technologies a financial incentive towards a purchase of a new non-radioisotopic device as well as the removal of their cesium device. This initiative may be offered internationally as well.



- ORS is working with U.S. government agencies and programs to evaluate policy on alternative technologies, investigate alternatives for all applications that utilize high-activity radioactive materials, and promote incentives to convert to alternatives.
- ORS is partnering with the World Institute for Nuclear Security (WINS) to develop a guide for users and regulators to enable evaluation of the feasibility of switching to non-radioisotopic technologies.
- Working with the International Atomic Energy Agency (IAEA) and member states, ORS is leading technical information exchanges and discussions on alternative technologies including barriers preventing implementation of alternative technologies.

For more information, contact: ORSInfo@nnsa.doe.gov.



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