



“We recently decided to use X-ray instead of cesium irradiators in our new building. Mount Sinai is proactively looking at alternative technologies and will, hopefully, phase out all radioactive material as time goes by.”

– Jacob Kamen, PhD,
Senior Director Radiation Safety, Mount Sinai

About ORS

The Office of Radiological Security provides world-class security resources and technologies to businesses that utilize radioactive sources.

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



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Cesium Irradiator Replacement Project

Learn More About Permanent Risk Reduction and Incentives Offered by ORS.



Cesium Irradiator Replacement Project

The Department of Energy's (DOE) National Nuclear Security Administration (NNSA) Office of Radiological Security (ORS) is working with domestic users of cesium-137 based irradiators who are interested in converting to viable non-radioisotopic alternatives. The Cesium Irradiator Replacement Project, offered by ORS, provides qualified sites who are interested in making the switch with a financial incentive towards the purchase price of a new non-radioisotopic device, as well as the removal and disposal of the cesium irradiator. The Project was launched in 2014, and is supported by the United States' commitment to facilitate the replacement of 34 cesium-137 irradiators with non-radioisotopic alternatives by 2020.

Qualified participants will receive:

- Removal and disposal of the cesium-137 irradiator, saving the site approximately \$100–\$200k per irradiator.
- A limited financial payment towards the purchase of the new non-radioisotopic device, up to 50% of the purchase price. The payment will be disbursed when the cesium device has been removed and the non-radioisotopic device has been installed.
- Training, warranty/maintenance agreement costs, and spare part costs are the responsibility of the site.



Considerations for Cesium Irradiator Replacement

While radioactive sources play an important role in commercial, medical, and research facilities, the benefits of these sources must be balanced with sufficient security to prevent radiological materials from falling into the wrong hands.

Effective security for high-activity radioactive sources, such as cesium-137, requires expertise, security systems, and compliance with additional regulatory requirements.

Sites using radioisotope-based irradiators should consider several factors when exploring replacement with non-radioisotopic alternatives including:

- Equipment reliability.
- Ease of use.
- Operational protocols.
- Costs including device procurement, warranty and maintenance, infrastructure, and security costs.
- Potential liability.
- Unique user requirements.

Thanks to the maturation of technology, viable alternatives to cesium irradiators are now available and have proven to be comparable or even more effective than cesium for both research and blood irradiation in some cases. These alternatives have already been adopted and are in use by many facilities throughout the U.S. Benefits of non-radioisotopic irradiators include:

- Mitigation of security risks and costs associated with cesium-137.
- Elimination of the liability risk associated with cesium-137 devices.
- Consistent throughput over the lifetime of the device, whereas cesium-137 irradiators require longer irradiation time as the cesium source decays.

“By implementing the X-ray irradiator, OneBlood has further enhanced the safety of the blood supply and increased the security of our facilities. At the same time, the X-ray irradiator has enabled us to increase our blood irradiation throughput and has exceeded our expectations for performance and reliability.” – Alicia Bellido Prichard, OneBlood, Inc.



Replacing your cesium irradiator with a non-radioisotopic alternative may offer your enterprise an opportunity to meet cost and throughput needs while permanently reducing security risks.

The Office of Radiological Security

ORS works to prevent high-activity radiological materials from being used in acts of terrorism. ORS uses three strategies to enhance global radiological security:

- Protect radioactive sources used for vital medical, research, and commercial purposes.
- Remove and dispose of disused radioactive sources.
- Reduce the global reliance on high-activity radioactive sources by promoting the adoption and development of non-radioisotopic alternative technologies.

How Can You Learn More?

For further information on the Cesium Irradiator Replacement Project and to discuss whether and how the Project could work for your site, please contact ORS at ORSInfo@nnsa.doe.gov.