

The U.S. Cesium Irradiator Replacement Project (CIRP): Successes to date and efforts to engage U.S. sites

The Cesium Irradiator Replacement Project (CIRP) was established by the U. S. Department of Energy National Nuclear Security Administration's Office of Radiological Security (ORS) as part of its three-pillar approach to radiological material risk reduction. The first two pillars focus on enhancing security of existing radioactive sources and on removing disused radioactive sources. The third pillar, encompassing CIRP, is focused on reducing radiological materials by encouraging the transition to non-radioisotopic alternative devices, where possible, to achieve permanent risk reduction. However, unlike several countries in which using alternative technologies is mandatory because the use of cesium chloride is banned or significantly curtailed, such as in Norway and France, CIRP is voluntary. As a result, meeting risk reduction goals requires creative approaches to encourage sites to switch from cesium and cobalt to an alternative technology. This has included consistent outreach and education in various forums to organizations operating radioisotopic devices to stimulate interest in considering alternative technologies. The voluntary nature of the program has also required the creation of an effective incentive structure, the need to address site concerns, such as the appropriateness and reliability of the alternative technology, establishment of a disposition pathway for the disused sources, and a method for gathering operational data from sites that switch from cesium and cobalt to an alternative technology. This data is used to help recruit additional volunteer sites. In the roughly 4 ½ years since CIRP began, the program has achieved permanent risk reduction by eliminating and replacing 83 cesium and cobalt devices with alternative technologies. This has included commitments by two large U.S. organizations to replace the vast majority of their cesium and cobalt devices with alternative technologies; the University of California system and New York City.

Achieving risk reduction goals in the U. S. by voluntarily eliminating the use of cesium chloride became more urgent with the passage of the 2019 U.S. National Defense Authorization Act (NDAA), which was signed into law on August 18, 2018. That bill contained a provision that established a deadline for eliminating the use of blood irradiation devices in the United States that rely on cesium chloride by December 31, 2027, through existing voluntary programs, including CIRP, to incentivize the replacement of those cesium chloride blood irradiation devices. This has put a premium on using incentives and other means to accelerate the pace of the program to meet that deadline. In addition, acceleration of CIRP implementation also puts a premium on pivoting the program from its current focus on blood and research irradiators toward other applications, including Sterile Insect Technique (SIT) and industrial irradiators and radioisotopic well-logging devices, applications for which alternative technologies may not be immediately available.

This paper will provide an overview of how CIRP was able to secure volunteer sites to transition to x-ray technology, the kinds of incentives used, how the program was able to address site concerns about the replacement devices, how the program is working toward meeting the 2027 deadline, and the future of CIRP as it applies to other applications beyond blood and research irradiators. In so doing, the paper can provide a useful roadmap for other States to achieve similar permanent risk reduction results.

State

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