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## Upgrading the Irradiation Facilities and Multidisciplinary Radiation Chemistry Research at Oregon State University

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**Collaborators:** N/A

**Program:** General Scientific Infrastructure

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### ABSTRACT:

**Project Objectives:** Upgrading Irradiation Facilities and revitalization of multidisciplinary research program in radiation chemistry, physics, material sciences and biology at the OSU Department of Nuclear Engineering and Radiation Health Physics. Our current cobalt source is more than five half-lives old, and is no longer able to provide reasonable radiation dose rates, so refurbishing our existing Gamma-Cell 220 with new cobalt-60 source will allow for dose rate viable for extended research of chemical systems related to aqueous separation processing of used nuclear fuel. This improvement will synergistically combine with our extended capabilities in spectroscopic and other methods for post-irradiation analysis and evaluation of radiation changes and provide an improved capability for nuclear science and engineering R&D projects relevant to the U.S. DOE-NEUP program mission.

**Project Effort:** The funds provided by the NEUP program infrastructure award will be devoted to acquisition of new research instrumentation for nuclear materials research at OSU (new Co-60 source for the existing GammaCell-220 irradiator) that are necessary the address the most important radiochemical and materials science challenges.

**Impact:** Behavior of materials under extreme conditions is of great research interest. This project will improve the OSU research infrastructure and benefit all researchers and students interested in chemistry, and radiochemistry, nuclear engineering, radiation health physics, chemical engineering and material sciences as well as other fields of science in the campus (e.g., radiobiology). Regarding to undergraduate research, such hands-on learning experience will reinforce the understanding of the theoretical material learned from the classroom while developing advanced experimental skills. Publications or conference presentations by our student researchers will recruit more students into our graduate programs. The successful realization of this effort will enable OSU to educate highly capable individuals who will be needed to fill the critical needs of tomorrow's nuclear infrastructure, while concurrently contributing to mission and needs of DOE-NE.