NE-23-29919 – An Advanced Multiphysics Simulation Capability for Radiant's Microreactor Design and Shielding Analysis

El Segundo, California is home to Radiant Industries Incorporated, a nuclear technology company developing Kaleidos, a 1.2 Mwe portable gas-cooled microreactor that offers a zero-emissions option for power in remote locations.

For a portable microreactor, minimizing shielding mass/volume/cost is a major design constraint. The integration of the core and shielding analysis tools to design a safe and economically viable microreactor is critical.

Radiant will partner with Argonne National Laboratory (ANL) to build a mulitphysics coupling in the Cardinal software of the Kaleidos reactor. They will then collaborate with Multiphysics Object-Oriented Simulation Environment (MOOSE) framework experts at Idaho National Laboratory (INL) to extend Cardinal to support software links necessary to predict decay heat sources in OpenMC. Radiant will utilize the coupled codes to perform reactor design optimization.