NEUP Nuclear Energy University Program
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New Fission Chamber for Rhode Island Nuclear Science Center

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Collaborators: N/A

Program: University Research
RU Infrastructure Support

ABSTRACT:

The Rhode Island Nuclear Science Center is a research nuclear reactor facility that is run by the Atomic Energy Commission of Rhode Island. The facility has been in operation since 1964. It provides nuclear science and engineering education at all levels of education, and serves education institutions not only in Rhode Island and the New England area, but also other states around the country, and in some cases from other countries around the world. The facility also collaborates with universities, research institutes, and national laboratories from around the world on a wide variety of research projects.

The objective of this project is to improve operational reliability of the facility's reactor safety systems by investing in a new fission chamber to replace the current aging equipment. The current fission chamber system has been in service for over 20 years and is beginning to show signs of failure and reduced accuracy. The fission chamber is a key component of the facility's reactor safety and control systems. Renewing the current system will ensure that the facility's operations and research capabilities are maintained for the foreseeable future.

The 2MW nuclear reactor at RINSC provides a source of neutron and gamma radiation for various experiments and research projects in the academic and private sectors. Users include both local, regional and global organizations. Reliable reactor operation allows these groups to utilize a variety of experimental methods which would otherwise be difficult or impossible to achieve. For the last twenty-five years, a small biotech company has used the reactor for neutron activation analysis to support medical diagnostics and research from universities and hospitals from all over the world. The University of Connecticut uses the reactor to produce Ho-166, which they are using for cancer research. Savannah River National Laboratory uses the reactor to find Cl impurities in Pd samples. NIST has been using the facility to look at the concentration of Cl and Cf in concrete to determine its structural integrity.

Reactor operation is dependent on constant monitoring of reactor power level. The fission chamber is one of three systems used to achieve this and is required to meet license specifications and is the only system that inputs to our reactor period scram and 3 counts per second interlock. Without an operational fission chamber we are unable to operate the reactor.