Enhancing the Operational Reliability of the TRIGA Reactor at Washington State University Utilizing Back-Up Reactor Core Nuclear Instrumentation

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Collaborators: N/A

ABSTRACT:

The Washington State University (WSU) Nuclear Science Center (NSC) provides a collaborative environment where faculty, staff, students, researchers, and external clients can succeed in their basic and applied nuclear science research goals. The NSC is also responsible for the safe operation of the WSU 1.0 MW TRIGA research reactor and collaborates in fundamental and applied nuclear research, isotope production, and materials characterization.

Detectors employed in the reactor core are currently 30+ years old and are at the end of their expected operational life. Spare detector and cabling will be acquired through this proposed project. The detectors, representing one spare for each required reactor power channel, will be sealed in a housing and tested in a spare detector well for certification as a spare that can be swapped should a currently used detector fail.

Long lead times and vendors exiting the nuclear market present challenges when procuring modern nuclear instrumentation and detectors required for operation of the nation's nuclear research reactor fleet. Lead times for these detectors start at 12 months, and since they are required for operation of the research reactor, present a potential bottleneck for operations or can shut down reactor operations at the facility for an extended period. Additionally, with the lack of integral cabling for these detectors as was once available, the currently available detectors must be sealed in a welded canister to prevent water intrusion into the cable/detector connection.

The goal of this project is to enhance the continued operational reliability of the WSU Nuclear Science Center 1.0 MW TRIGA conversion research reactor by procuring spare reactor power detectors to replace aging ex-core detectors and fabricating detector housings.