



Project Title

ISU AGN-201 Reactor Safety Channels Upgrade

Applicant Name: Idaho State University

Project Director/Principal Investigator: Adam Mallicoat

ABSTRACT:

The ISU nuclear engineering and health physics program includes over 250 students with six full-time faculty members and numerous part-time and adjunct faculty members. The program utilizes the AGN-201 research reactor in laboratory course instruction, reactor operator training and research activities. It is an invaluable learning experience for students to use their academic education in a hands-on manner before entering the nuclear workforce. This very safe and highly reliable reactor has been in operation for over fifty years and has the potential to continue doing so for decades to come.

Currently the reactor utilizes three aging BF3 filled radiation detectors serve the reactor safety channels. BF3 detectors are largely being discontinued due to the hazardous nature of the gas, which means it is no longer possible to source replacements. Recently one of the ion chambers failed and had to be replaced by scavenging a BF3 chamber from an experiment (reactivity oscillator), reducing the experiment's functionality. Having no viable option for continued replacement of the safety channel BF3 detectors the continued operation of the ISU AGN-201 is jeopardized.

Therefore, it is planned to replace the BF3 detectors with modern B-10 lined detectors. The requested safety instrumentation upgrades will significantly modernize reactor operations, improve reliability, and allow students to train using current technology. There will be an additional benefit to using the same neutron detection technology as industry in that ISU will benefit from their knowledge, as well as surplus equipment later on, and students would be training on neutron detectors that are currently used in industry. Upgrading the detectors used in reactor training, educational, and research operations will insure the AGN-201 research reactor does continue its reliable operation of the reactor for decades to come.