



University of Missouri Research Reactor (MURR) Reactor Engineering Upgrades

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Collaborators: N/A

Program: Reactor Upgrades

ABSTRACT: This proposal requests \$319,067 from the DOE NEUP University Research Reactor Upgrades Infrastructure Support Program to acquire and upgrade two regulatory significant Instrumentation and Control Systems for MURR's reactor operations and safety systems: paperless strip chart recorders and associated data acquisition system, and an off-gas (stack) effluent monitoring system. While these systems are essential to MURR operations, data from the systems will also support student and faculty research investigations in nuclear science and engineering fields. The main objective of the requested funds is to support MURR's educational and research mission through the continued reliable operations essential to support investigations in academic disciplines, including nuclear engineering, health physics, reactor safety, detector design and optimization, radiochemistry, nuclear analytic methods, data acquisition and analysis, and modelling and simulation of reactor systems. The replacement effluent stack monitor and the replacement paperless strip chart recorders are a high priority request for MURR's operations. The current Eberline PING (particulate, iodine, and noble gas) effluent monitoring system is over 30 years old and is no longer maintained by the vendor, thus making the system obsolete. Should the current monitoring system fail, an extended outage would be required to obtain and install a new system, thus disrupting all aspects of facility capabilities. Similarly, MURR's strip chart recording system – used to monitor and document compliance with license requirements – is based on old technology, and is thus increasingly expensive to operate (our supply budget for pen and chart paper alone is estimated at over \$14,000/year). MURR currently has over 50 years of paper-based recorder files, a volume that requires increasingly more physical storage space. Switching to a paperless data acquisition system will alleviate future storage needs, while also providing the distinct advantage for MURR operators and engineers and student-faculty investigators in having access to electronic information for use in their research and analyses. Under direction of Mr. Foyto (Project Director), senior operations and engineering staff will conduct the upgrade project according to following timeline (discussed in more detail in the Project Narrative section). We anticipate that each upgrade will be completed within the one-year period of DOE support. Phase 1: Specification and Procurement. The initial phase of the project will be final specification of the facility's off-gas (stack) effluent monitoring system and the strip chart recorders and associated data storage instrumentation, and working with the MU Office of Procurement Services for issuing bids or orders for components of the two systems, based on the University's and federal procurement policies. Phase 2: Installation. Once the equipment is received, Reactor Operations personnel will work with the MURR Electronics Group, and Campus Facilities Management and Information Technology groups to plan for physical replacement of the current stack effluent monitor and the Control Room's paper-based strip chart recorders. Installations will be scheduled to avoid facility downtime to avoid disruption of faculty-student research. With MURR's significance in relation to the nuclear science and engineering infrastructure in the United States, the requested funding under the DOE NEUP program is an excellent investment in our country's ability to respond to current and future nuclear



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workforce needs and further respond to an extensive academic research portfolio in Nuclear Engineering, Health Physics, Radiochemistry, and Reactor Safety.