



Infrastructure Upgrade (Minor) to the MITR Research Reactor in Support of Operational Safety

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Collaborators: NA

Program: Minor Reactor Infrastructure

ABSTRACT:

The MIT Nuclear Reactor Laboratory (NRL) requests funds to procure equipment for use in the MIT Research Reactor (MITR) nuclear safety system and the balance of plant. The procurement and installation of the requested items will improve safety, and thereby make the facility more attractive to both students and experimenters. The requested funds, \$153,644.00, will allow the NRL to procure: 1) a gaseous tritium detector, (2) a wide-range neutron monitor, and 3) an improved safety system display unit, the remaining \$3,644 will be provided by MIT as cost sharing.

The 6 MW MIT Research Reactor (MITR) is in a partnership with the DOE-Idaho Advanced Test Reactor and the National Scientific User Facility (ATR-NSUF) that is charged with performing fuel and advanced materials irradiation experiments crucial to future-generation reactors. High temperature and radiation-resistant materials are needed for proposed designs that would exhibit high thermal efficiency as well as for hydrogen-production reactors. A related and equally important goal is to identify advanced fuels and materials that will enable both life-extension and improved economic performance of the existing LWR fleet. For both objectives, some of the needed advanced materials include improved fuel cladding/fission product barriers (e.g., SiC, ZrC), structural materials, fuel matrix (e.g., hydride metallic fuel), and reactor safety components. Qualifying the performance of these materials requires in-pile irradiation testing and robust capability to examine the effects due to the irradiation. MIT requests funding under the DOE-Idaho Program, "Nuclear Energy University Programs – Reactor Upgrades" to enhance safety by procuring needed equipment/instruments for reactor operation. It is important to note that this infrastructure upgrade proposed for the MITR will benefit both MIT and all of the schools that are participating in the NSUF Program. This request will also augment our ability to attract and educate the brightest students in the field of fission nuclear engineering.