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## Enhancement of Availability of The Ohio State University Research Reactor for Supporting Research and Education

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**Program:** University Research Reactor Upgrades Infrastructure Support

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### ABSTRACT:

**Objective:** In this funding request, The Ohio State University Nuclear Reactor Laboratory (OSU-NRL) is proposing University Research Reactor Upgrades Infrastructure support for replacements for essential OSU Research Reactor (OSURR) control-room equipment that has been in continuous service for decades. These include custom reactor protection system (RPS) modules for which the lab has no spares. The desired equipment is essential to the operation of the reactor and includes:

1. Six Custom NIM modules, which are required for the RPS
2. Custom LogN-Period Amplifier, which is necessary for monitoring reactor power and rate of change
3. Victoreen 942A-200 Universal Digital Ratemeter (UDR), which is necessary for the effluent monitoring system

The objective of our request is to maintain a safe and reliable research facility as we continue to increase our capabilities and support and expand research at the OSU-NRL. Currently, a failure of one of the requested essential pieces of equipment could result in the suspension of reactor operations for an extended period of time. Having new modules, with the old modules kept as spares, would decrease the chance of failure and allow significantly faster recovery in the event of a failure. The equipment used is custom and/or has a long lead time. The probability of aging equipment experiencing a failure increases with time, while the availability of vendors to create such equipment continues to decrease. Therefore, it is prudent to obtain the requested replacements soon.

**Description:** The project goals will be accomplished by engaging with nuclear engineering vendors who have the capability and interest to engage in the design, creation and implementation of these parts. This will build upon improvements made with NEUP Research Reactor Upgrade awards received in recent years, with the ultimate goal of enhancing the safety and availability of The OSURR.

**Impact:** The OSURR, a Nuclear Science User Facilities (NSUF) partner facility is utilized for a wide range of research and educational endeavors that benefits a broad range of users, including both OSU and NSUF investigators. The requested equipment would decrease the probability of extended reactor downtime resulting from equipment failure and would therefore help maintain high availability of the OSURR for DOE mission-supporting research and education. An extended outage from equipment failure could result in experimenters missing research project milestones, which would negatively affect persons beyond the laboratory. A reliable reactor schedule is in the best interest of supporting these users and the education and training of students.