



Project Title

NuScale SMR Energy Exploration Center for UNLV Nuclear Engineering Program Education and Research

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Program: General Scientific
Infrastructure Support

ABSTRACT:

The objective of the proposed project is to improve the general scientific infrastructure of the Nuclear Engineering program at the University of Nevada - Las Vegas (UNLV). This project aims to acquire the *NuScale Energy Exploration (E2) Center*, a state-of-the-art full scope reactor simulator based on the NuScale small modular reactor (SMR) which is the first and only SMR design to be approved by the Nuclear Regulatory Commission to build and operate. The E2 Center is an innovative learning environment that offers students an exciting, hands-on opportunity to apply nuclear science and engineering principles through simulated, real-world nuclear power plant operation scenarios. The simulator contains the advanced automation features that are being developed for advanced reactors. The E2 library of digital procedures and automations ensures that operators are performing the correct actions on the correct unit. The tiered notification system informs operators of abnormal conditions and provides alarms, cautions, and notices. Using fully automated sequences, operators can elect to change power, change electrical output, and control selected equipment. The simulator's integrated emergency procedures graphically inform the operator of the condition of the reactor safety functions and link to applicable procedures.

This critical upgrade of the infrastructure will create a new paradigm in nuclear engineering training and research at UNLV. The E2 Center will be used in graduate and undergraduate classes, in K-12 outreach, and in research projects supporting the mission of the DOE's Office of Nuclear Energy including analysis and advancement of safety, security, reliability, and risk aspects addressing needs of several DOE CINR programs such as Advanced Reactor Development and Plant Optimization, Modeling and Simulation, Instrumentation and Controls, and Risk Informed Systems Analysis. The simulator will give students at UNLV the opportunity to experience advanced nuclear reactor technology in a digital control room setting, enabling a better understanding of nuclear engineering principles and hands-on experience of nuclear plant operations and maintenance. In absence of a nuclear reactor on the UNLV campus, this high fidelity reactor simulator will provide our students with the practical experience of reactor operations in control room settings using a modern human-machine interfaces that must be a critical component of any Nuclear Engineering program. The simulator will provide an engaging platform for learning about nuclear power role in creating a safe, clean, and secure energy future for the U.S. and the world.