U.S. Department of Energy

Multi-Universities for Small Modular Reactor Simulators: NuScale

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ABSTRACT:

The proposed project will provide three absolutely unique NuScale reactor plant simulator facilities at the following designated institutions: Texas A&M University (TAMU) in College Station, Texas, Center for Advanced Energy Studies (CAES) in Idaho Falls, Idaho, and Oregon State University (OSU) in Corvallis, Oregon.

NuScale's remote simulator is a virtual nuclear power plant control room that provides U.S. universities and national laboratories with the opportunity to experience nuclear plant behavior from the control room. Areas of research that can be explored with the remote simulator include human factors engineering, human-system interface design, advanced diagnostics, cyber security and plant control room automation. NuScale's remote simulator will give high school students and members of the public the opportunity to experience advanced nuclear technology in a control room setting.

This simulator will provide an opportunity for undergraduate and graduate students to study and evaluate the steady state and dynamic response of the NuScale modular reactor. They will learn how natural circulation and natural processes provide for a safe and effective reactor design and understand how to operate the reactor. With the simulator, startup, shutdown, flexible operation, and a variety of accident scenarios and off normal transients can be investigated. The all-digital control system will allow a unique opportunity to investigate the interrelationship between the digital control system and simulated threats. This simulator will also be used to demonstrate how a reactor will operate. K-12 students will have the opportunity to see how a nuclear reactor is operated and see the non-result of simulated accidents. Public officials and the public in general can learn about how a reactor works. The proposed remote simulator is a virtual nuclear power plant control room that provides U.S. universities and national laboratories with the opportunity to experience nuclear plant behavior from the control room. Areas of research that can be explored with the remote simulator include:

- human factors engineering,
- human-system interface design,
- advanced diagnostics,
- Cyber-security and plant control room automation.

In addition to supporting STEM research and education at universities, the remote simulator can be used to give high school students and members of the public the opportunity to experience advanced nuclear technology in a control room setting.