NEUP Nuclear Energy University Programs
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NEUP Workshop
Nuclear Instrumentation and Control Breakout Session

Nuclear Energy Enabling Technologies (NEET)

Advanced Sensors and Instrumentation

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NEET Program Overview

- Develop crosscutting technologies that directly support and complement the Office of Nuclear Energy's development of new and advanced reactor concepts and fuel cycle technologies
- Focus on innovative research relevant to multiple reactor and fuel cycle concepts that offer the promise of dramatically improved performance
- Supports R&D in the following areas:
  1. Reactor Materials ($11.9)
  2. Proliferation Risk Assessment ($5.38)
  3. Advanced Methods for Manufacturing ($11.9)
  4. Advanced Sensors and Instrumentation ($7.65)
- Encourage the development of transformative, "out-of-the-box" solutions across the full range of nuclear energy technology issues

NEET - Advanced Sensors and Instrumentation

Goals and Objectives

- Provide needed physical measurement accuracy of nuclear system process parameters and minimize uncertainty.
- Monitoring and control technologies to achieve control of new nuclear energy processes, new methodologies for monitoring to achieve high reliability and availability.
- Integrated control of multiple processes, potential reductions in staffing levels and role changes, and advanced human interaction technologies.
- Communications and data transmission needed for digital technologies, their environmental and regulatory qualification, and security issues.

Workscope Description

NEET-XASI: The Advanced Sensor and Instrumentation Activity within the Crosscutting Technology Development will conduct necessary R&D on sensors and infrastructure technology to address critical technology gaps to monitor and control new advanced reactors. The key university research needs for that activity are to

(1) develop a fundamental understanding of advanced sensors to improve physical measurement accuracy and reduce uncertainty,

(2) develop novel adaptive digital monitoring and control technology to provide increases in control system performance and self calibration capability,

(3) develop fundamental understanding of integrated control system architectures for multiple reactor module, and

(4) develop novel fiber optic and wireless digital instrument communication systems.