



LWRS Plant Modernization Overview

Advanced Sensors and Instrumentation

Annual Webinar

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Light Water Reactor Sustainability Program

Goals

 Enhance the safe, efficient, and economical performance of our nation's nuclear fleet and extend the operating lifetimes of this reliable source of electricity

Objectives

- Enable long-term operation of existing nuclear power plants
- Deploy innovative approaches to improve economics and economic competitiveness of LWRs in the near term and in future energy markets
- Sustain safety, improve reliability, enhance economics

Focus areas:

Address replacement of existing I&C technologies and enable plant efficiency

improvements

for long-term

modernization

through a strategy

Plant

Flexible Plant Operation and Generation

Evaluate and demonstrate integrated energy systems that competitively produce electricity and non-electrical products to optimize revenue generation by nuclear power plants

Risk Informed Systems Analysis

Develop significantly improved safety analysis methods and tools to optimize the safety, reliability, and economics of plants Materials Research

Understand and predict long-term behavior of materials in nuclear power plants, including detecting and characterizing aging mechanisms

Physical Security

Validate methods and tools which can be used to implement an updated physical security regime to optimize physical security at U.S. nuclear power plants

Current Plant Modernization Pathway Activities

I&C Architecture Full Nuclear Plant Modernization

- Control Room Modernization
- I&C Infrastructure Modernization

<u>Modernization</u> - The plant I&C systems and control rooms have been fully modernized with advanced digital technologies resulting in safe, economic operations with minimal operations staffing.



- Control System
- Hardware

 •IT Hardware Integration
- II Hardware Integra
 Control Room
 Integration

Data Architecture

- Advanced Remote Monitoring for Operations Readiness (ARMOR)
- Technology-Enabled Risk-Informed Maintenance Strategy (TERMS)
- Digital Architecture for an Automated Plant

<u>Automation</u> - Automation has displaced a substantial number of labor-intensive plant support tasks using advanced sensor, monitoring, and analytical technologies.



Advanced Applications

- Automation of the Work Process
- Advanced Concept of Operations

Innovation - For plant support functions that cannot be fully automated, advanced innovative technologies are deployed to maximize plant worker efficiency while eliminating human error.



Integration

•Plant Worker

