LWRS Plant Modernization Overview
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:**
  - **Plant Modernization**
    - Address replacement of existing I&C technologies and enable plant efficiency improvements through a strategy for long-term modernization
  - **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
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.

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

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