DOE-Sponsored Light Water Reactor Sustainability Program

Issues:

- Ninety-Four plants have sought and received operating license extension (40-60 years)
- Nineteen units have announced intentions (13) or have submitted (6) applications to NRC for subsequent license renewal (60-80 years); one site (Turkey Point) has received SLR approval from NRC.
- Understanding the mechanisms of materials aging for key structures, systems, and components and dealing with other forms of aging and obsolescence of plant technologies and capabilities are vital to sustaining the long term operation and performance of the existing light water reactor fleet.
- The U.S. Department of Energy's (DOE's) Light Water Reactor Sustainability (LWRS) program, working with the U.S. NRC and the Electric Power Research Institute (EPRI) have been coordinating and conducting collaborative projects to address key issues related to materials performance of SSCs for operating periods from 60 to 80 years since 2011.

LWRS Key Messages:

- The LWRS program is the DOE Office of Nuclear Energy's main programmatic activity that is being conducted to enhance the long term viability and competitiveness of the existing U.S. reactor fleet.
- The goals of the program are to provide science-based solutions to industry to implement technology that will enhance performance of the existing fleet and to manage the aging of plant systems, structures, and components to support safe, efficient, and economical continued operation.
- In addition to Materials performance, the LWRS program focuses on research and development to enable plant modernization, flexible plant operation and generation, risk-informed systems analysis, and physical security to enhance LWR plant performance and reduce operating costs.

LWRS Status and Next Steps:

- Much of the research and development activities of the LWRS program are conducted through private-public partnerships with industry and other stakeholders to enable deployment of innovative approaches to improve economics and economic competitiveness of LWRs in the near-term and in future energy markets.
    - Pilot projects are conducted in many research activities to achieve needed progress in selected areas and to provide industry the information needed to move forward in deploying these potential solutions in the operating fleet.
    - Awards to industry through Funding Opportunity Announcements from DOE exceeding $25 M to date will advance aging management of physical systems, automate remote and condition-based monitoring of plant systems and equipment, enhance approaches to fire PRA, and support the deployment of integrated energy systems at operating reactors to produce Hydrogen for commercial use.
- Close coordination will be maintained with owner-operators, Owner's Groups, vendors and suppliers, the regulator, and other industry groups to assist in the development of a proactive long term plan for research that delivers near-term results to enhance and sustain the existing fleet and maintain U.S. national capabilities in nuclear energy systems.

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