

EPRI's Research for Long-Term Operations

Issues:

- Renewable energy, clean energy, or net-zero portfolio targets are being set by organizations around the world. Nuclear power, the world's second largest source of zero carbon energy, could be used to achieve those targets.
- Nuclear power plant (NPP) operators around the world are investing in their existing assets to ensure continued reliable and economic extended operations into the future.
- Operators assessing if they want to make this investment use technical R&D from EPRI and other research organizations in their decision-making process. This includes information on material degradation in the plant operating environment, inspection technologies, mitigation measures, repair and replacement strategies, and equipment obsolescence.
- Economics is one of the challenges facing nuclear power plants. Some nuclear power plants have closed and retired prior to the expiration of their license due to economic reasons. If operators are to remain in operation cost-effectively, they will need to optimize operating costs and adapt to the changing market conditions.

EPRI Key Messages:

- EPRI has completed decades of research that form the technical basis for reliable and economic long-term operations of NPPs around the world. This research is conducted in coordination and collaboration with U.S. and international research partners such as the U.S. Department of Energy Light Water Reactor Sustainability (LWRS) Program, U.S. NRC Research, the Materials Aging Institute (MAI) and International Atomic Energy Agency (IAEA) among others.
- EPRI's research provides the technical basis for aging management. Nuclear plant operators around the world implement Aging Management Programs (AMPs) to inspect, mitigate and as needed, repair or replace systems, structures and components to provide reasonable assurance of continued safe operations. Through EPRI research programs, operating experience, lessons learned, and research results are shared. These AMP are living programs, and continuous improvement is a part of the process.
- EPRI's research also provides utility members with options to adapt to changing market conditions, such as power operations, and innovations for plant modernization that ensure reliability while reducing plant operating costs.

EPRI Status and Next Steps:

- Continued collaborative research with global partners to support aging management and innovations to address future plant needs is a part of EPRI's core business.
- EPRI's plant modernization initiative is developing industry peer-developed and reviewed Modernization Quick Guides of standard designs and demonstrations. The Plant Modernization Toolbox includes Modernization Technology Assessments, Business Case Examples and a Strategy Guide. It is available at:
<https://nuclearplantmod.epri.com>.
- EPRI's flexible operations collaborative research includes evaluating the economic and technical feasibility of alternative uses such as hybrid nuclear-renewable systems for generating hydrogen; and identifying plant changes needed for expanded ranges of flexible operations, e.g., ability to maneuver the plants deeper, faster and more frequently as renewable generation continues to increase.

Contact Information:

Heather Feldman
Director, Nuclear Innovation
EPRI
Office: 704-595-2735
hfeldman@epri.com