Long Term Operation Project

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Long Term Operation (LTO) Project Objectives

• Provide technology for continued operation of the current nuclear plants worldwide at high performance levels through 40 years, 60 years, or beyond.

• Investigate technical basis for “Life beyond 60”

• Collaborate with other organizations including DOE LWR Sustainability (LWRS) Program.
Criteria for LTO Activities

- **Technical investigation of:**
  - Potential “life limiting” issues
  - Aging management and life-cycle management
  - Opportunities for modernization and uprates
  - Enabling technology (e.g., analysis methods)

- **Not currently in scope of another program**

- **Results by 2014-2019 to support decisions about Long Term Operation**
LTO Approach

The program accomplishes its R&D objectives through several coupled strategies:

1. Maintain an integrated **strategic plan** for R&D
2. Fund **R&D activities** in high-priority technical areas using experts from EPRI programs
3. Collaborate with U.S. DOE LWRS program
4. Use **pilot** and **demonstration plants** to obtain data and validate methods of assessment.

18 member companies constitute an **LTO Task Force of advisors**
2011 R&D Projects

Primary System Materials Aging

• Primary metals: characterize, model IGSCC in Ni-alloys
• Primary metals: characterize / mitigate IASCC of stainless steel
• Assessing RPV embrittlement beyond 60 years
• Under-water welding for reactor internals

Concrete and Containment Aging

• Identification and research on potential life-limiting issues; guidelines and methods for concrete and containment examinations
2011 R&D Projects (cont)

Nuclear Fuel

• *SiC fuel clad* – SiC joining, in-reactor testing, and benefits assessment

I&C and Information Technology (IT)

• *Online monitoring* technology and pilot projects
• Functional and architectural requirements for advanced I&C and information systems

Safety Analysis

• *Advanced safety analysis methods*:
  New safety margins method and advanced safety analysis codes (R7)
• *New PRA tools* for configuration management, significance determination of plant conditions, and support for design, operational, or regulatory changes.
2011 R&D Projects (cont)

Cable Aging

• Testing and life management methods for medium voltage cables

Life Cycle Management

• Integrated life cycle management of key components – database and assessment tools
• Adaptation of EDF asset management tools and methods to ILCM

LTO Case Studies and Demonstrations

• Ginna and NMP-1 demonstration plant activities
• Plant refurbishment case studies*

* New project for 2011
What will be LTO deliverables?

• Automated knowledge bases
• Predictive algorithms or models
• Modeling and simulation tools
• Implementable inspection methods
• Aging management guidelines
• Life cycle management/asset management guidelines
• Plant modernizations with proof of concept

*LTO deliverables will be products in 2014-2019 to support license renewal and long term operation decisions.*
### Integration with License Renewal and Life Extension Processes

#### EPRI LTO Task Force
- Reviews portfolio and results regularly.

#### Periodic coordination meetings
- With all R&D stakeholders and utilities in license renewal.

#### EPRI maintains LTO Issue Tracking Table (ITT)
- On behalf of all stakeholders.

- Application to **License Renewal** is coordinated through NEI and NRC

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**Do we know all the issues?**

**Are we working on the right stuff?**