

June 14, 2012

MEMORANDUM TO: Mirela Gavrilas, Chief  
Corrosion and Metallurgy Branch  
Division of Engineering  
Office of Nuclear Regulatory Research

FROM: C.E. (Gene) Carpenter, Jr., Sr. Materials Engineer */RA/*  
Corrosion and Metallurgy Branch  
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Office of Nuclear Regulatory Research

SUBJECT: SUMMARY OF PUBLIC MEETING WITH U.S. DEPARTMENT OF  
ENERGY, ELECTRIC POWER RESEARCH INSTITUTE, AND  
NUCLEAR ENERGY INSTITUTE REGARDING LONG-TERM  
OPERATIONS RESEARCH PROGRAMS TO SUPPORT  
SUBSEQUENT LICENCE RENEWALS

On Thursday, June 7, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff met with representatives of the U.S. Department of Energy's Office of Nuclear Energy (DOE:NE) Light Water Reactor Sustainability (LWRS) Program, the Electric Power Research Institute (EPRI), and the Nuclear Energy Institute (NEI) to discuss on-going and planned long-term operability (LTO) research programs being conducted domestically. These LTO research programs are specifically looking at developing the technical information needed to make regulatory and business decisions regarding possible subsequent license renewal applications for the 60-80 year extended operating period. Attendees, including those who participated by telephone, are listed in Attachment 1. Presentation materials are included as Attachments 2 - 6.

The meeting began at 9:00 a.m. with a reiteration of the above purpose of the meeting and introductions of those in attendance and participating by telephone. Dr. Kathryn McCarthy, Director of the LWRS Technical Integration Office at Idaho National Laboratory (INL), then provided an overview of the LWRS Program (Attachment 2). Dr. McCarthy described the LWRS Program's vision, goals and scope, and then provided an overview of each of the four Pathways that the LWRS Program is investigating. For the Materials Aging and Degradation (MAaD) Pathway, she discussed several ongoing tasks, including the development of a nuclear concrete materials database (NCMDB).

The Instrumentation, Information, and Control System Technologies (IICST) Pathway has ongoing a pilot project to provides an advanced simulation facility to validate concepts that cannot practically be demonstrated in a nuclear power plant until they are validated (e.g., control room changes), and is working on a pilot project to demonstrate maintenance performance improvement at the Catawba Nuclear Power Plant (NPP). The Risk-Informed Safety Margin Characterization (RISMC) Pathway is working on developing and demonstrating a risk-assessment method for safety margins quantification which could evaluate safety margins related to major capital equipment changes, among other things. The Advanced LWR Nuclear Fuels (ANF) Pathway is seeking to develop high-performance, high burn-up fuels with improved safety, cladding integrity, and improved nuclear fuel cycle economics, with a focus on the development of silicon carbide (SiC) ceramic matrix composites (CMC) nuclear fuel cladding. Finally, Dr. McCarthy highlighted the complimentary work that the DOE LWRS Program is conducting with EPRI, and referred to the “DOE-NE Light Water Reactor Sustainability Program and EPRI Long-Term Operations Program – Joint Research and Development Plan, Revision 1, INL-EXT-12-24562,” dated April 2012, which can be downloaded from the INL LWRS Program website ([https://inlportal.inl.gov/portal/server.pt/document/102497/inl-ext-12-24562\\_lwrs-lto\\_joint\\_plan\\_rev\\_1\\_final\\_4-12-12\\_pdf](https://inlportal.inl.gov/portal/server.pt/document/102497/inl-ext-12-24562_lwrs-lto_joint_plan_rev_1_final_4-12-12_pdf)).

Ms. Sherry Bernhoft, EPRI Program Manager for Long Term Operations, discussed EPRI’s ongoing and planned LTO research, beginning with the criteria used to select research activities (Attachment 3). EPRI’s LTO research and development (R&D) activities comprise three categories: aging management (e.g., metals, concrete and cable aging), modernization (e.g., I&C and information technology pilot studies, enhanced fuel designs), and enabling technology (e.g., integrated life cycle and advanced analysis of safety margins). Ms. Bernhoft described EPRI’s work in completing an update to its Materials Degradation Matrix (MDM) and Issue Management Tables (IMT), in developing a Concrete Structures Aging Management Manual, and in developing a strategy for managing aging of cables. In addition, EPRI is performing a comprehensive review of aging management programs (AMPs) to identify enhancements and revisions to current AMPs for the subsequent license renewal (SLR) period of extended operations (PEO), i.e., 60 – 80 years. EPRI expects to complete this and other R&D efforts in time to support potential SLR applications in the 2015-2020 period.

The third overview, given by Mr. Chris Earls of the Nuclear Energy Institute (NEI), discussed NEI’s on-going commitment to ensuring that needed technical justifications to support SLR applications would be completed in a timely manner. Mr. Earls reiterated the industry’s commitment to safe operations in the present and any extended operation period, including subsequent PEOs.

After the no-host lunch break, NRC staff provided an overview of ongoing and planned aging management research. Mr. Gene Carpenter provided an overview (Attachment 4) of key materials degradation issues that may impact continued long-term safe operations, including metal fatigue, buried piping issues, electrical cable insulation degradation, containment and liner plate degradation, refueling cavity and spent fuel pool (SFP) leakage, SFP neutron absorber degradation, and aging issues related to concrete civil structures.

Ms. Sandra Lindo-Talin, Materials Engineer, provided a comprehensive overview (Attachment 5) of the license renewal process including recent updates to license renewal guidance documents (i.e., Generic Aging Lessons Learned – GALL – report and the Standard Review Plan for License Renewal, NUREGs 1801 and 1800) and Interim Staff Guidance for license renewal applications issued after the most recent GALL update. She discussed lessons learned from recent AMP audits and from international operating experience. Finally, she briefly described ongoing collaborative research efforts with domestic and international partners.

Ms. Lindo-Talin's overview was interrupted by a member of the public, Mr. Michael Leonardi of the Coalition Against Nukes, who stated, in brief, that the NRC staff were criminals, too closely aligned with the regulated industry, and that the NRC should be abolished. Mr. Leonardi then hung up.

The final presentation was provided by Ms. Barbara Baron, Principal Engineer at Westinghouse, who provided an overview of Westinghouse's LTO activities (Attachment 6). This includes development of inspection and repair techniques for buried equipment, development of Cable Health & Aging Management Program (CHAMP) program to focus on cables of interest, development of inspection techniques for concrete structures, and analysis of reactor vessel samples from the Zion plant. Additionally, Westinghouse is working with the PWR Owners Group to focus on aging issues.

The members of the public were then offered an opportunity to ask questions or make any statements. The only other member of the public to offer a comment was Mr. Greg Wilson, who stated a concern that NPPs should not be allowed to operate for extended periods due to potential natural catastrophes, such as meteorite strikes, which could potentially lead to multiple and simultaneous Fukushima-like events.

The staff, DOE, EPRI and NEI agreed to continue to have information exchanges to share details of ongoing and future LTO research activities in order to determine if there are areas in which the participants can appropriately coordinate future research efforts.

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