July 25, 2013

MEMORANDUM TO: Anthony J. Mendiola, Chief
Licensing Processes Branch
Division of Policy & Rulemaking
Office of Nuclear Reactor Regulation

FROM: Joseph A. Golla, Project Manager ***/RA/***
Licensing Processes Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JUNE 25, 2013, DESIGN AUDIT OF THE BOILING WATER REACTOR OWNERS GROUP

On June 25, 2013, U.S. Nuclear Regulatory Commission (NRC) staff met with representatives of the Boiling Water Reactor (BWR) Owners Group (BWROG) for a design audit at NRC headquarters in Rockville, Maryland. The purpose of the audit was for the NRC staff to gain a better understanding of the design of the test apparatus to be used at Alden Research Laboratory, Holden, Massachusetts, to support the assumptions and analyses of BWROG-TP-11-002, Revision 2, "Licensing Topical Report: Boiling Water Reactor Emergency Core Cooling Suction Strainer In-Vessel Downstream Effects, NEDC-33608P." A list of NRC staff and industry participants is enclosed.

Licensing Topical Report (LTR) BWROG-TP-11-002, Revision 2, is a proprietary document. A redacted version of it may be viewed by the public on the NRC Agencywide Documents Access and Management System (ADAMS) at Accession No. ML110140481. This LTR is currently being reviewed by the NRC staff. It provides the results of an updated analysis of the downstream effects (DSE) of debris on BWR fuel manufactured by GE-Hitachi Nuclear Energy Americas, LLC (GEH). It also provides a bounding approach for loss-of-coolant accidents (LOCAs) based on sensitivity studies and analytical techniques. BWROG-TP-11-002, Revision 2, was written to address the in-vessel DSE issue identified in a letter written by Mr. John Grobe, Associate Director for Engineering and Safety Systems, Office of Nuclear Reactor Regulation, to Mr. Richard Anderson, BWROG Executive Chairman, dated April 10, 2008, entitled "Potential Issues related to Emergency Core Cooling Systems (ECCS) Strainer Performance at Boiling Water Reactors" (ADAMS Accession No. ML080500540). The letter encouraged the BWROG to develop a comprehensive evaluation plan integrated with the efforts of the NRC to address in-vessel DSE and six other issues related to post-LOCA long term core cooling detailed in the letter.

The NRC staff reviewed information provided by the BWROG that described the present approach to the design of the test loop and facility, the test loop design for each test to be performed, the design process, technical details and the test facility. The discussion of test loop design information focused on the potential range of parameters that could be encountered in the testing rather than actual values of parameters to be used in specific tests. The NRC staff provided informal feedback to the BWROG on design aspects of the test loop and testing procedures based in part on experience with similar testing for generic issue GI-191. Several notes from the discussion are summarized below:

- To the extent possible, consistency of the test loop design with responses to requests for additional information on NEDC-33608P should be ensured (e.g., with respect to whether Tests 2 and 3 fully encompass prior tests, whether flows in the test rig will be driven by a pump and flow control system or a hydrostatic head of water, and the extent to which the counter current flow limitation will be simulated in Tests 4b and 4d).
- Additional effort may be necessary to ensure that the quality of the water used in the test rig is prototypical or conservative relative to expected plant conditions. Previous tests have indicated that the type of water used in a test rig (e.g., local tap water, deionized water) may have a significant influence on debris bed formation and head loss.
- Details concerning the means of injecting air into the test rig for Tests 4b and 4d have not been finalized and were beyond the scope of discussion.

The BWROG stated it expected to do “shakedown testing” of the test loop in the late September/early October 2013 timeframe and fuels testing in 2014 and invited the NRC staff to travel to the Alden Research Laboratory to observe. The NRC staff stated they are interested in observing testing activities. During this trip, the BWROG and Alden Research Laboratory further agreed to provide access to the computational fluid dynamics analysis performed by Alden Research Laboratory to support the design of the scaled test rig.

Enclosure:
As stated

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DATE	07/22/2013	07/16/2013	07/23/2013	07/25/2013	07/25/2013

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List of Attendees

Regulatory Audit of the Boiling Water Reactor Owners Group (BWROG)

by the U.S. Nuclear Regulatory Commission (NRC) Staff on June 25, 2013

NAME	AFFILIATION/AGENCY
Ervin Geiger	NRC
John Lehning	NRC
Sheena Whaley	NRC
Steve Smith	NRC
Stew Bailey	NRC
Joseph Golla	NRC
Michael Iannantuono	BWROG – GEH
Michael Kennard	Anatech
Ludwig Haber	Alden Research Laboratory
Matthew Horowitz	Alden Research Laboratory
Steve Scammon	Energy Northwest
Dan Fouts	Entergy Operations
Phillip Grissom	SNC
Rob Choromokos	Anatech

ENCLOSURE

BWR Owners Group Project No. 691
cc:

BWROG Vice Chairman
Lesa Hill
Southern Nuclear Operating Company
PO Box 1295 Bin B048
Birmingham, AL 35201-1295
lphill@southernco.com

BWROG Project Manager
Michael Iannantuono
GE-Hitachi Nuclear Energy
PO Box 780 M/C A-70
3901 Castle Hayne Road
Wilmington, NC 28402
Michael.iannantuono@ge.com

BWROG Program Manager
Kenneth McCall
GE-Hitachi Nuclear Energy
PO Box 780 M/C A-70
3901 Castle Hayne Road
Wilmington, NC 28402
Kenneth.mccall@ge.com

GEH Senior Vice President
Jerald G. Head
Senior Vice President, Regulatory Affairs
GE-Hitachi Nuclear Energy
PO Box 780 M/C A-18
Wilmington, NC 28401
jerald.head@ge.com

BWROG ECCS Suction Strainers
Committee Chairman
Steve Scammon
slscammon@energy-northwest.com