July 7, 2006

MEMORANDUM TO: Darrell J. Roberts, Chief, Section 2
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: Michael L. Scott, Chief ***/RA/***
Safety Issue Resolution Branch
Division of Safety Systems
Office of Nuclear Reactor Regulation

SUBJECT: GENERIC LETTER 2004-02 "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED WATER REACTORS" EXTENSION REQUEST APPROVAL FOR SALEM, UNIT 2

The Safety Issue Resolution Branch (SSIB) has reviewed and evaluated the information provided in Public Service Electric and Gas' (PSEG) June 7, 2006 letter, a combined updated response to Generic Letter 2004-02 "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors" and request for extension to the GL 2004-02 December 31, 2007 completion date for Salem, Unit 2 to address sump clogging plant modifications. SSIB has determined that it is acceptable to extend the completion date for the insulation modifications for this unit until the completion of the Spring 2008 refueling outage, scheduled to begin approximately March 12, 2006. Attached to this memorandum are the results of the SSIB evaluation of this matter. Please note the suggested 30-day grace period on Salem 2 Spring 2008 outage commencement at the end of the attachment. If you have any questions, please contact Leon Whitney of SSIB. Please include Joe Golla and Leon Whitney on distribution for any correspondence with the licensee regarding this matter.

Docket No: 50-311

Attachment: As stated

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Salem, Unit 2 GSI-191/GL 2004-02 Extension Request Approval

In a June 7, 2006 updated response to NRC Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors," PSEG Nuclear LLC (PSEG) provided updated information on its ongoing activities for resolution of the Generic Safety Issue (GSI)-191 containment sump clogging issue. As well as reporting on certain completed additional actions taken in response to GL 2004-02, PSEG requested an extension beyond December 31, 2007 for removal of certain insulation in the Salem, Unit 2 containment.

PSEG stated that a design change package for Salem, Unit 2 had been issued for installation during the Fall 2006 outage of a 5300 square foot strainer with 1/12-inch openings. PSEG also stated that trisodium phosphate is not used as a pH buffer at Salem, reducing the expectation of significant quantities of chemical precipitate as discussed in NRC Information Notice (IN) 2005-26 and IN 2005-26 Supplement 1. PSEG stated that it will remove all calcium silicate within the loss-of-coolant accident (LOCA) zones of influence (ZOIs) by December 31, 2007.

PSEG further stated that, as a result of planned July 2006 loop testing of representative fiber combined with Salem-specific chemical precipitates (from interactions with the sodium hydroxide pH buffer), the new strainer design was expected to have adequate margin for chemical effects.

PSEG stated that the Salem downstream effects evaluations had been completed and had been found acceptable for ex-vessel blockage and wear of downstream components.

PSEG discussed a non-Salem specific, conservative Westinghouse initial scoping evaluation of the long-term core coolability of the fuel with fibrous and particulate debris in the recirculation fluid. The evaluation concluded that passage of about 1 cubic foot or more of fibrous debris could result in a thin-bed effect at the bottom of the fuel.

PSEG stated that testing performed with the replacement strainer design for Salem with the current (non-calcium silicate insulation) fiber load had demonstrated a fibrous debris bypass of approximately 5 cubic feet. PSEG stated that there were ongoing actions underway to address this issue:

- PSEG discussions with Westinghouse indicated that the assumptions for the formation of a 1/8-inch fiber bed at the bottom of the fuel are conservative, and can possibly be relaxed when considering the physical characteristics of the actual fibrous debris bypassed. From vendor test results, 90% of the Salem bypass fibers are relatively short (.004 to .04 inches), as compared to fuel bottom nozzle flow holes of 0.2 inches. The licensee stated that these fibers will not mat across the fuel bottom nozzles.

- Westinghouse is developing Salem-specific acceptance criteria to quantify the acceptable fiber bypass for long-term cooling, but this result is not expected to be completed until as late as September 2006. PSEG stated that it expects the bypass results from the Salem testing to be acceptable under these revised acceptance criteria.

ATTACHMENT

PSEG stated that it was confident that no additional insulation would need to be removed to comply with the expected new allowable fiber bypass acceptance criteria. However, assuming that application of the Salem-specific fiber bypass acceptance criteria results in a need to remove additional insulation, PSEG requested to defer the fibrous insulation replacement for the following reasons:

- PSEG has scheduled replacement of the Salem, Unit 2 steam generators during the Spring 2008 outage. The replacement steam generators are to be insulated with custom-engineered reflective metal insulation (RMI). If the current Salem, Unit 2 steam generator insulation were to be replaced on an interim basis in the Fall 2006 Salem 2 outage, the new insulation would need to be removed and replaced when the new steam generators are installed in the Spring 2006 outage. PSEG stated that this would result in 22 REM of additional exposure and generation of approximately 1800 cubic feet of radiological waste.

- If interim pressurizer insulation and pressurizer piping insulation were to be installed in the Fall 2006 outage and later replaced during the Spring 2008 outage, an additional 50 REM ALARA penalty would result.

PSEG stated that the likelihood of a LOCA would be low during the requested extension period in 2008 (January 1, 2008 to March 12, 2008). PSEG subsequently provided the NRC staff a copy of an NRC letter to PSEG dated May 25, 1994 which confirmed that Salem Unit 1 and Unit 2 are both NRC-accepted leak-before-break reactor primary coolant loop plants. PSEG stated that the small incremental risk during the requested extension period resulting from not installing interim insulation would be more than offset by avoidance of additional radiation exposure to plant workers.

The NRC has confidence that PSEG has a plan that will result in the installation of final GSI-191 modifications that provide acceptable strainer function with adequate margin for uncertainties. Further, the NRC has concluded that PSEG has put mitigation measures in place to adequately reduce risk for the requested short extension period, and it is therefore acceptable to extend the completion date for the corrective actions for the issues discussed in Generic Letter 2004-02 (specifically the replacement of fiber insulation on the steam generators and pressurizer insulation and pressurizer piping insulation) until the completion of the Salem, Unit 2 Spring 2008 refueling outage, currently scheduled to begin approximately March 12, 2008. Should PSEG elect to begin the Salem, Unit 2 outage more than 30 days after March 12, 2008, PSEG will need to provide the NRC additional justification for further delay in completing corrective actions for GL 2004-02.