PSEG Nuclear LLC
P.O. Box 236, Hancocks Bridge, New Jersey 08038-0236

MAY 1 5 2002

PSEG Nuclear LLC

LR-N02-0178

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

RESPONSE TO NRC BULLETIN 2002-01
REACTOR PRESSURE VESSEL HEAD DEGRADATION AND
REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY
SALEM GENERATING STATION UNITS 1 AND 2
FACILITY OPERATING LICENSES NOS. DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311

Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," required operators of pressurized-water reactors (PWR) to submit within 60 days of the date of this bulletin, the following information related to the remainder of the reactor coolant pressure boundary:

- The basis for concluding that your boric acid inspection program is providing reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05 and this bulletin. If a documented basis does not exist, provide your plans, if any, for a review of your programs.

The basis for concluding that our boric acid inspection program provides reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05 and this bulletin is provided in Attachment 1 to this letter. Should you have any questions regarding this response, please contact Michael Mosier at (856) 339-5434.

A095

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,

Mark B. Bezilla
Vice President Nuclear Technical Support

Attachment

C: Mr. H. J. Miller, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. R. Fretz, Project Manager - Salem
U. S. Nuclear Regulatory Commission
Mail Stop 08B2
Washington, DC 20555

Mr. R.Lorson (X24)
USNRC Senior Resident Inspector

Mr. K. Tosch, Manager IV
Bureau of Nuclear Engineering
33 Arctic Parkway
CN 415
Trenton, NJ 08625

Within 60 days of the date of this bulletin, all PWR addressees are required to submit to the NRC the following information related to the remainder of the reactor coolant pressure boundary:

REQUESTED INFORMATION:

The basis for concluding that your boric acid inspection program is providing reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05 and this bulletin. If a documented basis does not exist, provide your plans, if any, for a review of your programs.

PSEG RESPONSE:

By letter dated May 27, 1988, Public Service Electric and Gas (PSEG) provided a response to Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Boundary Components in PWR Plants. On January 4, 1989, the NRC issued a letter stating that PSEG has provided assurance that a program is in place dealing with boric acid leakage that could potentially affect the reactor coolant pressure boundary. PSEG's basis for concluding its boric acid inspection program continues to provide reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05 and Bulletin 2002-01 is as follows:

Program Description:

The boric acid corrosion-monitoring program at Salem Units 1 and 2 provides reasonable assurance of our ability to detect, evaluate, and correct Reactor Coolant System (RCS) leakage in a timely fashion. This program consists of several Operations and In-Service Inspection (ISI) procedures and leak detection systems. Additionally, ISI Boundary drawings identify inspection locations and inspection methods to be performed such as visual or other NDE techniques. The purpose of the program is threefold:

1. Find Reactor Coolant System (RCS) leaks, and boric acid deposits,
2. Evaluate and assess equipment condition, and
3. Disposition the leakage/boric acid finding(s) in PSEG's Corrective Action Program.

The Operations department is responsible for performing various walkdowns and surveillances that are used in conjunction with several systems to identify RCS leaks and aid in locating boric acid deposits resulting from leakage. Both Salem units employ the following leak detection systems:

- The containment atmospheric particulate radioactivity monitor, R11A – monitored continuously.

- The containment atmospheric gaseous radioactivity monitor, R12A – monitored continuously.
- The containment sump level monitoring system – monitored at least once per 12 hours.
- The containment fan cooler condensate flow rate monitoring system – monitored continuously.
- The reactor coolant drain tank level monitoring system – monitored at least once per 24 hours.
- The reactor sump level monitoring system – monitored at least once per 24 hours.
- The RCS water inventory balance – monitored once every 24 hours.
- Monitoring of the reactor head flange leakoff system – monitored at least once per 24 hours.
- Monitoring the safety injection accumulator levels – monitored once every 12 hours.

When action levels on the above systems are reached further investigations and/or inspections are performed. These systems, in conjunction with outage walkdowns, routine power entries into containment, and ISI examinations, aid in identifying the presence of leakage within the Reactor Coolant System (RCS).

The activities of the ISI Group are a vital component of the boric acid corrosion-monitoring program. The ISI Group is responsible for performing Salem Units 1 and 2 In-Service Inspections in accordance with the requirements imposed by ASME Boiler and Pressure Vessel Code Section XI (ASME XI). ASME XI requires VT-2 examinations be conducted to detect evidence of leakage from pressure retaining components with or without leakage collection systems as required during the conduct of system pressure tests.

Inspection Scope and Frequency:

Leakage sources for those systems containing borated water are identified utilizing the inspections required by this program. The following Salem Class 1, 2, and 3 systems and components contain borated water:

- Residual Heat Removal
- Safety Injection
- Chemical Volume Control
- Containment Spray
- Reactor Coolant System
- Pressurizer Spray
- Pressurizer Relief
- Spent Fuel Cooling

The scope of these inspections address external leakage of these systems, the corrosion of their components (e.g. bolting, supports, etc.) and potential corrosion of other components in their vicinity that are associated with other systems.

Operations procedures S1/S2.OP-PT.CAN-0001 (Q), "Containment Walkdown," were developed in response to Generic Letter 88-05 to standardize our boric acid inspections. During selected operating evolutions, containment walkdowns are performed to detect RCS and other leaks. Specifically, during a refueling outage (RFO), walkdowns are performed during Mode 3 as soon as possible after reactor shutdown. at normal operating pressure (NOP) and normal operating temperature (NOT) and at the conclusion of the RFO when in Mode 3 after heating up with normal temperature and pressure established. Should the unit be removed from service in mid-cycle, containment walkdowns are again performed to detect leaks.

Operators also regularly perform visual examinations for leaks outside containment and leakage tests in accordance with SC.SA-AP.ZZ-0051 (Q), "Leakage Monitoring Program." Operator rounds are conducted frequently during shift and direction is given in this procedure to be cognizant of any leaks observed during rounds and to document any deficiencies found through the Corrective Action Program.

System pressure tests are conducted by ISI upon Class 1, 2, and 3 borated systems. Class 1 system pressure tests are conducted at the conclusion of each refueling outage (18 months) prior to startup activities. Class 2 and 3 system pressure tests are conducted once every 36 months during each 10-year inspection interval. System leakage examinations (VT-2) are conducted during system pressure tests in accordance with procedure SH.RA-IS.ZZ-0005 (Q), "VT-2 Visual Examination of Nuclear Class 1, 2, 3 Systems". This procedure incorporates EPRI Technical Report 1000975, Boric Acid Corrosion Guidebook, November 2001. Acceptance criteria are contained in the visual inspection procedure.

ASME Section XI requires systems borated for the purposes of controlling reactivity to have installed insulation removed from pressure retaining bolted connections for VT-2 visual examinations. Therefore, there are no limitations that obstruct visual inspection of Class 1 and 2 systems and components at Salem Generating Station Units 1 and 2 during VT-2 exams.

The presence of discoloration or residue on surfaces examined is given particular attention to detect evidence of boric acid accumulation from borated reactor coolant leakage. When VT-2 visual inspections are conducted examiners are required to note all sources of noted leakage, which can include flanges, valve packing, and threaded pipe caps.

Procedure NC.NA-AP.ZZ-0054 (Q), "Operating Experience (OE) Program," requires review of both Internal and External Operating Experience. If the review determines that

the OE is applicable to our facilities, an evaluation is performed. This OE evaluation could require program changes.

Response to Leakage

Corrective actions are required when boric acid leaks from components and areas of corrosion are discovered. Affected areas typically display discoloration or accumulated residue on surfaces of components, insulation, or floor areas. PSEG procedures describe the required corrective actions when leakage is noted. These actions are identified in Engineering and ISI Programs.

Review of Program Effectiveness

The boric acid corrosion-monitoring program has been an ongoing process at Salem since the late 1980's. The program was originally implemented as a result of boric acid leaks experienced at Salem Unit 2 Generating Station and NRC GL 88-05. This program addresses the Generic Letter program requirements including:

1) The determination of the principal locations where coolant leaks smaller than allowable Technical Specification limits could cause degradation of the pressure boundary,

2) Methods for conducting examinations that are integrated into ASME Code VT-2 inspections conducted during system pressure tests, and

3) Corrective actions to prevent recurrences of this type of leakage.

The program has provided timely identification of leakage and implementation of corrective actions as evidenced by a review of recent walkdown documentation and followup by the Corrective Action Program. Since establishing this program, there have been no instances of boric acid corrosion impacting the integrity of the reactor coolant pressure boundary. Additionally, operators are instructed to maintain vigilance for leaks during their daily rounds and report any leaks discovered promptly.

PSEG Nuclear examinations include periodic visual and surface examinations and surveillance walkdowns supplemented by preemptive volumetric examinations. All examinations are designed to find potential and actual RCS leaks in a timely fashion to prevent significant corrosion damage to structures, systems, and components (SSCs).

A self-assessment completed in December 2001, benchmarked PSEG's leakage monitoring program outside containment against other plants and determined the surveillances performed by PSEG personnel are adequate in identifying and correcting borated water leaks.

Conclusion

We have reviewed our response to Generic Letter (GL) 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants, (NLR-N88081), NUREG/CR5576, Survey of Boric Acid Corrosion of Carbon Steel Components in Nuclear Plants, and the aforementioned boric acid corrosion monitoring program elements, and based on the information provided in this letter, we conclude that there is reasonable assurance that both Salem Units 1 and 2 are in compliance with applicable regulatory requirements and our current licensing basis. The technical basis for concluding that regulatory bases are met for Salem Units 1 and 2 is provided in MRP-48 (reference 1).

References:

1. NEI letter from Mr. Alexander Marion to Dr. Brian Sheron, dated August 21, 2001, subject: "EPRI Report TP-1006284, "PWR Materials Reliability Program Response to NRC Bulletin 2001-01 (MRP-48)."