June 10, 2010

Mr. Thomas Joyce
President and Chief Nuclear Officer
PSEG Nuclear LLC
P.O. Box 236
Hancocks Bridge, NJ 08038

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR SALEM NUCLEAR GENERATING STATION UNITS 1 AND 2 LICENSE RENEWAL APPLICATION (TAC NOS. ME1834 AND ME1836)

Dear Mr. Joyce:

By letter dated August 18, 2009, as supplemented by letter dated January 23, 2009, Public Service Enterprise Group Nuclear, LLC, submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54 for renewal of Operating License Nos. DPR-70 and DPR-75 for Salem Nuclear Generating Station Units 1 and 2, respectively. The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing this application in accordance with the guidance in NUREG-1800, “Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants.” During its review, the staff has identified areas where additional information is needed to complete the review. The staff’s request for additional information is included in the Enclosure. Further requests for additional information may be issued in the future.

Items in the enclosure were provided to John Hufnagel and other members of your staff, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me by telephone at 301-415-2981 or by e-mail at bennett.brady@nrc.gov.

Sincerely,

/RA/

Bennett M. Brady, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosure:
As stated

cc w/encl: See next page

June 10, 2010

Mr. Thomas Joyce
President and Chief Nuclear Officer
PSEG Nuclear LLC
P.O. Box 236
Hancocks Bridge, NJ 08038

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR SALEM NUCLEAR GENERATING STATION UNITS 1 AND 2 LICENSE RENEWAL APPLICATION (TAC NOS. ME1834 AND ME1836)

Dear Mr. Joyce:

By letter dated August 18, 2009, as supplemented by letter dated January 23, 2009, Public Service Enterprise Group Nuclear, LLC, submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54 for renewal of Operating License Nos. DPR-70 and DPR-75 for Salem Nuclear Generating Station Units 1 and 2, respectively. The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing this application in accordance with the guidance in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." During its review, the staff has identified areas where additional information is needed to complete the review. The staff's request for additional information is included in the Enclosure. Further requests for additional information may be issued in the future.

Items in the enclosure were provided to John Hufnagel and other members of your staff, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me by telephone at 301-415-2981 or by e-mail at bennett.brady@nrc.gov.

Sincerely,

/RA/
Bennett M. Brady, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosure:
As stated

cc w/encl: See next page

DISTRIBUTION:
See next page

ADAMS Accession No. ML101460077

OFFICE	PM:DLR:RPB1	LA:DLR	BC:DLR:RPB1	PM:DLR:RPB1
NAME	B. Brady	S. Figueroa	B. Pham	B. Brady
DATE	6/9/10	6/1/10	6/9/10	6/10/10

OFFICIAL RECORD COPY

Letter to T. Joyce from B. Brady dated June 10, 2010

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR SALEM NUCLEAR GENERATING STATION UNITS 1 AND 2 LICENSE RENEWAL APPLICATION (TAC NOS. ME1834 AND ME1836)

DISTRIBUTION:

HARD COPY:
DLR RF

E-MAIL:
PUBLIC
RidsNrrDlr Resource
RidsNrrDlrRpb1 Resource
RidsNrrDlrRpb2 Resource
RdsNrrDlrRarb Resource
RidsNrrDlrRasb Resource
RidsNrrDlrRapb Resource
RidsOgcMailCenter Resource

BPham
BBrady
ACunanan
SCuadrado
CEccleston
REnnis
CSanders
BHarris, OGC
ABurritt, RI
RConte, RI
MModes, RI
DTifft, RI
NMcNamara, RI

Salem Nuclear Generating Station,
Units 1 and 2

cc:

Mr. Robert Braun
Senior Vice President Nuclear
PSEG Nuclear LLC
One Alloway Creek Neck Road
Hancocks Bridge, NJ 08038

Mr. Brian Booth
Director Nuclear Oversight
PSEG Nuclear
P.O. Box 236
Hancocks Bridge, NJ 08038

Mr. John Perry
Station Vice President – Hope Creek
PSEG Nuclear
P.O. Box 236
Hancocks Bridge, NJ 08038

Mr. Larry Wagner
Plant Manager - Hope Creek
PSEG Nuclear LLC
One Alloway Creek Neck Road
Hancocks Bridge, NJ 08038

Mr. Michael Gallagher
Vice President – License Renewal Projects
Exelon Nuclear LLC
200 Exelon Way
Kennett Square, PA 19348

Mr. Jeffrie J. Keenan, Esquire
Manager - Licensing
PSEG Nuclear LLC
One Alloway Creek Neck Road
Hancocks Bridge, NJ 08038

Mr. Gregory Sosson
Director Corporate Engineering
PSEG Nuclear LLC
One Alloway Creek Neck Road
Hancocks Bridge, NJ 08038

Mr. Michael Gaffney
Manager - Hope Creek Regulatory
Assurance
PSEG Nuclear LLC
One Alloway Creek Neck Road
Hancocks Bridge, NJ 08038

Mr. Ali Fakhar
Manager, License Renewal
PSEG Nuclear LLC
One Alloway Creek Neck Road
Hancocks Bridge, NJ 08038

Township Clerk
Lower Alloways Creek Township
Municipal Building, P.O. Box 157
Hancocks Bridge, NJ 08038

Mr. Paul Bauldauf, P.E., Asst. Director
Radiation Protection Programs
NJ Department of Environmental
Protection and Energy, CN 415
Trenton, NJ 08625-0415

Mr. Brian Beam
Board of Public Utilities
2 Gateway Center, Tenth Floor
Newark, NJ 07102

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. Paul Davison
Vice President, Operations Support
PSEG Nuclear LLC
One Alloway Creek Neck Road
Hancocks Bridge, NJ 08038

cc:

Ms. Christine Neely
Director – Regulator Affairs
PSEG Nuclear LLC
One Alloway Creek Neck Road
Hancocks Bridge, NJ 08038

Senior Resident Inspector
Hope Creek Generating Station
U.S. Nuclear Regulatory Commission
Drawer 0509
Hancocks Bridge, NJ 08038

Mr. Earl R. Gage
Salem County Administrator
Administration Building
94 Market Street
Salem, NJ 08079

REQUEST FOR ADDITIONAL INFORMATION FOR SALEM NUCLEAR GENERATING STATION (SNGS) UNITS 1 AND 2 LICENSE RENEWAL APPLICATION (LRA) (TAC NOS. ME1834 AND ME1836)

RAI B.2.1.7-01

Background:

Based on a review of GALL Report Table 1, line item 80, for cast austenitic stainless steel (CASS) reactor vessel internal components, the GALL recommends use of the GALL AMP XI.M13, "Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)" Program to manage the aging effect of loss of fracture toughness/thermal aging embrittlement. The GALL Report does not have an aging effect of cracking, stress-corrosion cracking (SCC), irradiation-assisted stress-corrosion cracking (IASCC), void swelling, or changes in dimension line item with CASS as the material.

Issue:

Several line items in LRA Table 3.1.2-3, assigned generic note C, have an aging effect of cracking, SCC, IASCC, changes in dimension and void swelling with CASS material components. These line items credit the LRA pressurized-water reactor (PWR) Vessel Internals AMP. These line items reference GALL Report NUREG-1801 Volume 2 line items which list stainless steel instead of CASS as the material. Additionally, one LRA Table 3.1.2-3 line item associated with a loss of fracture toughness/neutron irradiation embrittlement, and void swelling credits the PWR Vessel Internals Program and assigns this line item generic note E. Although there is no specific GALL line item for an aging effect of cracking, SCC, IASCC, changes in dimension and void swelling with CASS material components, the staff questions why the LRA does not credit GALL AMP XI.M13, "Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)" Program to manage these aging effects.

Request:

Provide a justification for using the PWR Vessels Internals AMP instead of GALL AMP XI.M13, "Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)."

RAI B.2.1.23-01

Background:

GALL AMP XI.M35, Element 4 "detection of aging effects," states that inspections of ASME Code Class 1 small-bore piping should be volumetric.

Issue:

The LRA Sections B.2.1.23 and A.2.1.23 state socket welds that fall within the weld examination sample will be examined using visual examination (VT-2). The staff notes that the proposed inspection methodology is not consistent with GALL.

Request:

Please provide technical basis how VT-2 can adequately manage aging in ASME Code Class 1 socket welds.

RAI B.2.2.2-03

Background:

Section A1.2.3 of NUREG-1800, Appendix A states that the “acceptance criteria” of the program and its basis should be described.

Issue:

In element 6 of the LRA AMP it states that “acceptance criteria” for loss of material are based on the original equipment design wall thickness and any corrosion allowance requirements. It is not clear to the staff what the “acceptance criteria” for determining effects of aging on aluminum components are.

Request:

Clarify what the “acceptance criteria” for determining effects of aging on aluminum components are.

RAI 3.1.1-01

Background:

Standard Review Plan-License Renewal (SRP-LR) Section 3.1.2.2.13 identifies that cracking due to primary water stress-corrosion cracking (PWSCC) could occur in PWR components made of nickel alloy and steel with nickel alloy cladding, including reactor coolant pressure boundary components and penetrations inside the reactor coolant system (RCS) such as pressurizer heater sheathes and sleeves, nozzles, and other internal components. GALL Report Volume 2 Item IV.D1-06 recommends Chapter XI.M2, “Water Chemistry,” for PWR primary water for managing the aging effect of cracking in the nickel alloy steam generator (SG) divider plate exposed to reactor coolant.

In LRA Table 3.1.1, Item 81, the applicant credits its Water Chemistry Program to manage cracking due to stress corrosion cracking in nickel alloy steam generator (SG) primary channel head divider plate exposed to reactor coolant in the steam generators.

In UFSAR Section 5.5.2.2.1, the applicant describes that the divider plate is made with Inconel 690 for Unit 2 replacement steam generators. The staff notes that the use of this nickel alloy 690 should prevent the aging effect of PWSCC.

However, there is no information about the construction material of the divider plate for Unit 1 steam generators.

Issue:

From recent operating experience in steam generators with a similar design to that of Salem Unit 1 steam generators, extensive cracking due to PWSCC has been identified in SG divider plates made with nickel alloy 600, even with proper primary water chemistry. Specifically, cracks have been detected in the stub runner, very close to the tubesheet/stub runner weld and with depths of almost a third of the divider plate thickness. Therefore, the staff notes that the Water Chemistry Program alone may not be effective in managing the aging effect of cracking due to PWSCC in SG divider plates.

Such cracks could impact adjacent items, such as the tubesheet and the channel head, if they propagate to the boundary with these items. For the tubesheet, PWSCC cracks in the divider plate could propagate to the tubesheet cladding with possible consequences to the integrity of the tube/tubesheet welds. For the channel head, the PWSCC cracks in the divider plate could propagate to the SG triple point and potentially affect the pressure boundary of the SG channel head.

Request:

Please discuss the materials of construction of your Unit 1 SG divider plate assembly. If these materials are susceptible to cracking (e.g., nickel alloy 600 or the associated nickel alloy 600 weld materials), please discuss the potential for cracking in the divider plate to propagate into other components (e.g., tubesheet cladding).

If propagation into these other components cannot be ruled out, please describe an inspection program (examination technique and frequency) to ensure that there are no cracks propagating into other items (e.g., tubesheet and channel head) that could challenge the integrity of other adjacent items.