May 12, 2008

MEMORANDUM TO: Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: Richard B. Ennis, Senior Project Manager ***/ra/***
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2, DRAFT REQUEST FOR ADDITIONAL INFORMATION (TAC NOS. MD8259 AND MD8260)

The attached draft request for information (RAI) was transmitted on May 12, 2008, to Mr. Jeff Keenan of PSEG Nuclear LLC (the licensee). This information was transmitted to facilitate an upcoming conference call in order to clarify the licensee's amendment request for Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2, dated March 11, 2008. The proposed amendment would revise the Technical Specification requirements for fuel decay time prior to commencing movement of irradiated fuel in the reactor pressure vessel.

This memorandum and the attachment do not convey or represent an NRC staff position regarding the licensee's request.

Docket Nos. 50-272 and 50-311

Attachment: Draft RAI

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DRAFT REQUEST FOR ADDITIONAL INFORMATION

REGARDING PROPOSED LICENSE AMENDMENT

DECAY TIME TECHNICAL SPECIFICATION REQUIREMENTS

SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-272 AND 50-311

By letter dated March 11, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML080930080), PSEG Nuclear LLC (PSEG or the licensee) submitted an amendment request for Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. The proposed amendment would revise the requirements for fuel decay time prior to commencing movement of irradiated fuel in the reactor pressure vessel (RPV). Currently, Technical Specification (TS) 3/4.9.3, "Decay Time," requires that: (a) the reactor has been subcritical for at least 100 hours[1] prior to movement of irradiated fuel in the RPV between October 15th through May 15th; and (b) the reactor has been subcritical for at least 168 hours prior to movement of irradiated fuel in the RPV between May 16th and October 14th. The calendar approach is based on average river water temperature which is cooler in the fall through spring months. The proposed amendment would allow fuel movement to commence at 80 hours after the reactor is subcritical between October 15th through May 15th. The proposed amendment would also relocate TS 3/4.9.3 to either the Updated Final Safety Analysis Report (UFSAR) or the Technical Requirements Manual (TRM).

The Nuclear Regulatory Commission (NRC or the Commission) staff has reviewed the information the licensee provided that supports the proposed amendment and would like to discuss the following issues to clarify the submittal.

The NRC's regulatory requirements related to the content of the TSs are set forth in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical specifications." This regulation requires that the TSs include items in five specific categories. These categories include: (1) safety limits; limiting safety system settings and limiting control settings; (2) limiting conditions for operation (LCOs); (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls. However, the regulation does not specify the particular TSs to be included in a plant's TSs.

On July 22, 1993 (58 FR 39132), the Commission published a "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (Final Policy Statement) which discussed the criteria to determine which items are required to be included in the TSs as LCOs. The criteria were subsequently incorporated into the regulations by an amendment to 10 CFR 50.36 (60 FR 36953). Specifically, 10 CFR 50.36(d)(2)(ii) requires that a TS LCO be established for each item meeting one or more of the following criteria:

1 The current TS decay time requirement of 100 hours is applicable through the year 2010. After 2010, the 168 hour decay time requirement would be applicable for refueling outages occurring between October 15th and May15th. On March 5, 2008, the NRC approved a one-time change for Salem Unit No.2 (Amendment No. 271) which revised TS 3/4.9.3 to allow fuel movement to commence at 86 hours after the reactor is subcritical for refueling outage 2R16 (spring 2008 outage).

Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 3: A structure, system or component that is part of the primary success path and which functions or actuates to mitigate a design-basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 4: A structure, system or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

Existing LCOs and related SRs included as TS requirements which satisfy any of the criteria stated above must be retained in the TSs. Those TS requirements which do not satisfy these criteria may be relocated to other licensee-controlled documents.

On page 24 of Attachment 1 of PSEG's application dated March 11, 2008, the licensee provided its analysis regarding the criteria described in 10 CFR 50.36(d)(2)(ii) in order to justify relocating TS 3/4.9.3 to either the UFSAR or the TRM. With respect to Criterion 2, PSEG stated that:

> The FHA [fuel handling accident] is the related design basis accident and inherently postulates a radiological release from a dropped fuel assembly during refueling. The decay time assumption in the FHA analysis (24 hours) defines the nature of the radiological products released from the breached fuel rods.
>
> TS 3/4.9.3 restricts movement of fuel until the requisite decay time assumed in the FHA analysis has elapsed. The FHA does not assume any further delay in fuel movement beyond the initial hold time. Since the administrative controls as well as the inherent delay associated with completing the required preparatory steps for moving fuel in the reactor vessel will ensure that the proposed 80 hour decay time (from October 15th through May 15th) will be met for a refueling outage, this TS is not needed to uphold the FHA analysis assumption. During the development of NUREG-1431, the industry/NRC agreed that this LCO could be relocated to a licensee controlled document, since it is not required to be in TS to provide adequate protection of the health and safety of the public. Therefore, this specification should be relocated to the TS Bases document, consistent with NUREG-1431.

Decay time is an operating restriction that is an initial condition assumed in the radiological consequences analysis for an FHA. As such, decay time satisfies Criterion 2 of 10 CFR 50.36(d)(2)(ii). However, for some plants, the NRC has approved the relocation of the decay time TS requirements to a licensee-controlled document because the time needed to complete all operational steps, prior to moving fuel in the RPV, was greater than the decay time assumed in the FHA analysis. As such, the necessary decay time would always be met and relocation of the TS requirements would have no impact on plant safety. For the same reasons, the decay time TS requirements were removed from the Standard Technical Specifications.

The current Salem decay time TS requirements are not based on the 24 hour decay time assumed in the FHA analysis, but on more restrictive decay time requirements to ensure that the design-basis spent fuel pool (SFP) water temperature limit of 180 °F is not exceeded. As discussed in PSEG's letter LR-N02-0300 dated August 15, 2002 (ADAMS Accession No. ML022380023), the 180 °F value is an administrative limit which was established to address concerns pertaining to SFP liner integrity. UFSAR Section 9.1.3.3 states that:

> As a result of self-assessments performed on the fuel pool and associated structures, systems and components (SSCs) in 1995, concerns were identified that called into question the ability of these SSCs to perform their design basis functions under loss of normal fuel pool cooling conditions as a result of a design basis earthquake where the heat load in the pools could cause the pool temperature to exceed 180°F. These concerns were resolved by a seismic upgrade of the Spent Fuel Pool Cooling System to render temperatures above 180°F non-credible. The upgrade not only evaluated the capability of the system to remain functional following a seismic event, but also evaluated potential single active failures and various external hazards (such as flooding, missiles, seismic-non-seismic interactions, etc.) that could result in interruption of forced cooling. The evaluation concluded pool temperature would be maintained 180°F and below under normal, abnormal, and accident conditions.

As discussed in the Final Policy Statement:

> The purpose of the Technical Specifications is to impose those conditions and limitations upon reactor operation necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to public health and safety by identifying those features that are controlling importance to safety and establishing on them certain conditions of operation which cannot be changed without prior Commission approval.

In addition, 10 CFR 50.36(b) states, in part, that:

> The Commission may include such additional technical specifications as the Commission finds appropriate.

As noted above, the NRC staff has previously approved the relocation of the decay time TS requirements to a licensee-controlled document for some plants because the necessary decay time would always be met based on the time needed to complete all operational steps prior to moving fuel in the RPV. However, PSEG's justification to relocate TS 3/4.9.3 is not consistent with the cited precedence since administrative procedures are needed to ensure the necessary decay time will be met at both Salem units. Given that decay time satisfies Criterion 2 of 10 CFR 50.36(d)(2)(ii), and the importance in maintaining the SFP water temperature below its design limit for SFP liner integrity concerns, the NRC staff believes that, consistent with the Final Policy Statement and 10 CFR 50.36(b), TS 3/4.9.3 should be retained in the Salem TSs. PSEG is requested to supplement the application such that the scope of the amendment request pertains only to changing the TS 3/4.9.3 decay time requirements from 100 hours to 80 hours (i.e., scope would no longer include the request to relocate the TS 3/4.9.3 requirements to the UFSAR or TRM).