



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

March 12, 2020

Mr. Eric Carr  
President and Chief Nuclear Officer  
PSEG Nuclear LLC - N09  
P.O. Box 236  
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 – ISSUANCE OF AMENDMENT NOS. 334 AND 315 RE: RELOCATE TECHNICAL SPECIFICATIONS 3/4.9.3 AND 3/4.9.12 TO TECHNICAL REQUIREMENTS MANUAL (EPID L-2019-LLA-0143)

Dear Mr. Carr:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment Nos. 334 and 315 to Renewed Facility Operating License Nos. DPR-70 and DPR-75 for the Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2, respectively. These amendments consist of changes to the technical specifications (TSs) in response to your application dated June 28, 2019.

The amendments relocate Salem, Unit Nos. 1 and 2, TS 3/4.9.3, "Decay Time," and TS 3/4.9.12, "Fuel Handling Area Ventilation System," to the Salem Technical Requirements Manual.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

*/RA/*

James S. Kim, Project Manager  
Plant Licensing Branch I  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosures:

1. Amendment No. 334 to DPR-70
2. Amendment No. 315 to DPR-75
3. Safety Evaluation

cc: Listserv



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

PSEG NUCLEAR LLC

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 334  
Renewed License No. DPR-70

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment filed by PSEG Nuclear LLC, acting on behalf of itself and Exelon Generation Company, LLC (the licensees), dated June 28, 2019, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-70 is hereby amended to read as follows:

- (2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 334, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. PSEG Nuclear LLC shall operate the facility in accordance with the Technical Specifications, and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

James G. Danna, Chief  
Plant Licensing Branch I  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility Operating  
License and Technical Specifications

Date of Issuance: March 12, 2020

ATTACHMENT TO LICENSE AMENDMENT NO. 334  
SALEM NUCLEAR GENERATING STATION, UNIT NO. 1  
RENEWED FACILITY OPERATING LICENSE NO. DPR-70  
DOCKET NO. 50-272

Replace the following page of Renewed Facility Operating License No. DPR-70 with the attached revised page as indicated. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

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Replace the following pages of the Appendix A, Technical Specifications, with the attached revised pages as indicated. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

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instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

- (5) PSEG Nuclear LLC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (6) PSEG Nuclear LLC, pursuant to the Act and 10 CFR Parts 30 and 70, to possess but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

PSEG Nuclear LLC is authorized to operate the facility at a steady state reactor core power level not in excess of 3459 megawatts (one hundred percent of rated core power).

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 334, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. PSEG Nuclear LLC shall operate the facility in accordance with the Technical Specifications, and the Environmental Protection Plan.

(3) Deleted Per Amendment 22, 11-20-79

(4) Less than Four Loop Operation

PSEG Nuclear LLC shall not operate the reactor at power levels above P-7 (as defined in Table 3.3-1 of Specification 3.3.1.1 of Appendix A to this renewed license) with less than four (4) reactor coolant loops in operation until safety analyses for less than four loop operation have been submitted by the licensees and approval for less than four loop operation at power levels above P-7 has been granted by the Commission by Amendment of this renewed license.

(5) PSEG Nuclear LLC shall implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

PSEG NUCLEAR LLC

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-311

SALEM NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 315  
Renewed License No. DPR-75

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment filed by PSEG Nuclear LLC, acting on behalf of itself and Exelon Generation Company, LLC (the licensees), dated June 28, 2019, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-75 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 315, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. PSEG Nuclear LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

James G. Danna, Chief  
Plant Licensing Branch I  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility Operating  
License and Technical Specifications

Date of Issuance: March 12, 2020

ATTACHMENT TO LICENSE AMENDMENT NO. 315  
SALEM NUCLEAR GENERATING STATION, UNIT NO. 2  
RENEWED FACILITY OPERATING LICENSE NO. DPR-75  
DOCKET NO. 50-311

Replace the following page of Renewed Facility Operating License No. DPR-75 with the attached revised page as indicated. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

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Replace the following pages of the Appendix A, Technical Specifications, with the attached revised pages as indicated. The revised pages are identified by amendment number and contains marginal lines indicating the areas of change.

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- (4) PSEG Nuclear LLC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use at any time any byproduct, source or special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration and as fission detectors in amounts as required;
  - (5) PSEG Nuclear LLC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
  - (6) PSEG Nuclear LLC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
- C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
- (1) Maximum Power Level  
  
PSEG Nuclear LLC is authorized to operate the facility at steady state reactor core power levels not in excess of 3459 megawatts (thermal).
  - (2) Technical Specifications and Environmental Protection Plan  
  
The Technical Specifications contained in Appendix A, as revised through Amendment No. 315, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. PSEG Nuclear LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 334 AND 315 TO

RENEWED FACILITY OPERATING LICENSE NOS. DPR-70 AND DPR-75

PSEG NUCLEAR LLC

EXELON GENERATION COMPANY, LLC

SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-272 AND 50-311

1.0 INTRODUCTION

By letter dated June 28, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19179A073), PSEG Nuclear LLC (the licensee) submitted a license amendment request (LAR) for the Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. The proposed amendments would relocate Salem, Unit Nos. 1 and 2, Technical Specification (TS) 3/4.9.3, "Decay Time," and TS 3/4.9.12, "Fuel Handling Area Ventilation System," to the Salem Technical Requirements Manual (TRM).

2.0 REGULATORY EVALUATION

2.1 System Design Descriptions

2.1.1 Spent Fuel Pool Cooling System Design

The spent fuel pool cooling system consists of three subsystems: the cooling subsystem, the purification subsystem, and the skimmer subsystem. The cooling subsystem is of relevance to the review of the licensee's proposed changes.

The cooling loop consists of spent fuel pumps and the spent fuel pool heat exchanger. During the heat removal operation, fuel pool water flows from the spent fuel pool to the suction of a spent fuel pool pump, is pumped through the tube side of the heat exchanger, and is then returned to the pool. If the operating spent fuel pool pump fails, the second pump supplies 100 percent backup. Component cooling water circulates through the shell of the heat exchanger. Heat is removed from the spent fuel cooling system heat exchangers by the safety-related component cooling water system, which is cooled by the safety-related service water system.

Both Salem, Unit Nos. 1 and 2, have separate spent fuel pools and cooling loops. Piping and valves are installed to allow the Unit Nos. 1 and 2 heat exchangers to be cross connected.

During normal plant operation, the heat exchangers operate independently to meet the cooling requirements of the individual units. However, if the heat load is unusually high, both heat exchangers may be used in parallel to minimize the temperature rise in a spent fuel pool. Each spent fuel pool cooling system has its maximum duty during refueling operations when the decay heat from the spent fuel is the highest.

### 2.1.2 Fuel Handling Area Ventilation System Design

The fuel handling area is a structure separate from other unit structures and is provided with its own ventilation system. Because of the potential for radioactive releases from the spent fuel, defective fuel cladding or a fuel handling accident (FHA), the fuel handling building (FHB) is maintained at a slight negative pressure to assure in-leakage of air rather than out-leakage.

This fuel handling area ventilation system (FHAVS) is a once-through filtered air system that continuously ventilates the normal operating areas (fuel pools, decontamination pit, electrical equipment room, and sump tunnel). Supply air enters the building at the cask storage area, flows through the building to the spent fuel pool area, and is exhausted to the unit vent where total plant effluent is continually monitored for radioactivity.

The exhaust filter units, fans, and controls are designed to Class I (seismic) criteria. The discharge ductwork from the fuel handling area to the plant vent is also designed to Class I (seismic) criteria. The supply air equipment is served by the normal alternating current power system only, whereas the exhaust air equipment can be energized from the standby AC power system in the event of a loss of offsite power.

In the event radioactivity levels within the FHB become excessive, all exhaust effluent is diverted to the standby high-efficiency particulate air (HEPA) and charcoal exhaust unit. This exhaust effluent path through the HEPA and charcoal filters is not credited in the FHA analysis for the FHB.

## 2.2 Licensee's Proposed Changes

### 2.2.1 TS 3/4.9.3, "Decay Time"

Current Salem TS 3/4.9.3 requires suspension of all operations involving movement of irradiated fuel in the reactor pressure vessel if the reactor has been subcritical for less than 80 hours during each calendar year from October 15 through May 15. TS 3/4.9.3 also requires suspension of all operations involving movement of irradiated fuel in the reactor pressure vessel if the reactor has been subcritical for less than 168 hours during each calendar year from May 16 through October 14. Surveillance Requirement 4.9.3 states, "The reactor shall be determined to have been subcritical as required by verification of the date and time of subcriticality prior to movement of irradiated fuel in the reactor pressure vessel."

The proposed change would relocate TS 3/4.9.3 to the Salem TRM. Each respective vacated TS page would be marked, "This page intentionally blank."

After relocation to the Salem TRM, any changes to TRM 3/4.9.3 would be subject to the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59, "Changes, tests and experiments."

## 2.2.2 TS 3/4.9.12, "Fuel Handling Area Ventilation System"

Current Salem TS 3/4.9.12 requires that "During movement of irradiated fuel within the Fuel Handling Building," the fuel handling area ventilation system be operable. An operable system is defined as (a) two exhaust fans and one supply fan operable and operating and (b) capable of maintaining slightly negative pressure in the FHB.

The "action" statement for Unit Nos. 1 and 2 reads:

- a. With no Fuel Handling Area Ventilation System OPERABLE, suspend all operations involving movement of fuel within the storage pool until the Fuel Handling Area Ventilation System is restored to OPERABLE status
- b. The provisions of Specification 3.0.3 are not applicable.

The surveillance requirements for both units consist of three parts that are identical and read:

The above required ventilation system shall be demonstrated OPERABLE:

- a. In accordance with the Surveillance Frequency Control Program by verifying that, the Fuel Handling Building is maintained at a slightly negative pressure with respect to atmospheric pressure.
- b. In accordance with the Surveillance Frequency Control Program by verifying both exhaust fans and one supply fan start and operate for at least 15 minutes, if not operating already.
- c. In accordance with the Surveillance Frequency Control Program by verifying a system flowrate of 19,490 cfm  $\pm$  10% during system operation.

The proposed change would relocate TS 3/4.9.12 to the Salem TRM. Each respective vacated TS page would be marked, "This page intentionally blank."

After relocation to the Salem TRM, any changes to TRM 3/4.9.12 would be subject to the requirements of 10 CFR 50.59.

## 2.2.3 Index -- Limiting Conditions for Operation and Surveillance Requirements

Changes would also be made to support relocation of TSs 3/4.9.3 and 3/4.9.12 to the Salem TRM. TS page IX, "Index," for Unit Nos.1 and 2 would be revised to delete the references to TSs 3/4.9.3 and 3/4.9.12.

## 2.3 Regulatory Requirements

On July 22, 1993, the U.S. Nuclear Regulatory Commission (NRC or the Commission) issued a "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (Final Policy Statement) (58 FR 39132). The Final Policy Statement encouraged licensees to implement a voluntary program to update their TSs to be consistent with improved vendor-specific standard technical specifications (STs) issued by the NRC. In the Final Policy Statement, the NRC developed criteria to determine which of the TS requirements should be retained and which requirements could be relocated to licensee-controlled documents. The four

screening criteria contained in the Final Policy Statement were subsequently incorporated into the regulations by an amendment to 10 CFR 50.36(c)(2)(ii) (60 FR 36953). As discussed in the *Federal Register* notice for the final rule dated July 19, 1995 (60 FR 36955):

LCOs [limiting conditions for operation] that do not meet any of the criteria, and their associated actions and surveillance requirements, may be proposed for relocation from the technical specifications to licensee-controlled documents, such as the FSAR [Final Safety Analysis Report]. The criteria may be applied to either standard or custom technical specifications.

- (A) *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.
- (B) *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.
- (C) *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.
- (D) *Criterion 4.* A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

#### Other Regulations

Section 50.67, "Accident source term," paragraph (b), "Requirements," of 10 CFR 50.67 states, in part:

- (E) The NRC may issue the amendment only if the applicant's analysis demonstrates with reasonable assurance that:
  - (i) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 rem)<sup>2</sup> total effective dose equivalent (TEDE).
  - (ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage), would not receive a radiation dose in excess of 0.25 Sv (25 rem) total effective dose equivalent (TEDE).
  - (iii) Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 rem) total effective dose equivalent (TEDE) for the duration of the accident.

Guidance for staff review of TSs is contained in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 16.0, "Technical Specifications." In accordance with the Final Policy Statement, the NRC staff has prepared STS for each of the light-water reactor nuclear steam supply systems and associated balance-of-plant equipment systems. The Commission encourages licensees to use the STS as the basis for plant-specific TSs. The guidance specifies that the staff review whether the content and format of proposed TSs are consistent with the applicable STS. Where TS provisions depart from the reference STSs, the staff determines whether proposed differences are justified by uniqueness in plant design or other considerations. The applicable current STS for Salem, Unit Nos. 1 and 2, are contained in NUREG-1431, Revision 4.0, "Standard Technical Specifications - Westinghouse Plants," Volume 1, "Specifications," and Volume 2, "Bases."

### 3.0 TECHNICAL EVALUATION

#### 3.1 Deletion of TS 3/4.9.3, "Decay Time"

The licensee proposes to delete TS 3/4.9.3 from the Salem, Unit Nos. 1 and 2, Renewed Facility Operating Licenses. The unchanged requirements of TS 3/4.9.3 would be relocated to the Salem TRM.

On October 10, 2002, the NRC issued Amendment Nos. 251 and 232 for Salem, Unit Nos. 1 and 2, respectively (ADAMS Accession No. ML022770181). The amendments revised the fuel decay time in TS 3/4.9.3 from the more restrictive 168 hours throughout the year to 100 hours from October 15 to May 15. The licensee added corresponding information to the Salem TS Bases regarding the spent fuel cooling analysis and the spent fuel pool integrated decay heat management (IDHM) program. In support of these amendments, a discussion of the spent fuel pool integrated decay heat management program was added to the Salem Updated Final Safety Analysis Report (UFSAR), Section 9.1.3. The IDHM program requires a pre-outage assessment of the spent fuel pool heat loads and heatup rates to assure the available spent fuel pool cooling capability prior to offloading fuel during plant refueling operations.

On March 5, 2008, the NRC issued Amendment No. 271 for Salem, Unit No. 2 (ADAMS Accession No. ML080320421), which allowed a TS 3/4.9.3 one-time change in fuel decay time from 100 hours to 86 hours during October 15 to May 15. The amendment authorized fuel movement within the reactor after 86 hours of subcriticality. In the submittal requesting the amendment, a new FHA dose analysis was submitted to the NRC as Attachment 5, entitled Calculation S-C-ZZ-MDC-1920, Revision 4IR0, "Fuel Handling Accident Radiological Consequences Evaluation." The revised FHA analysis used a bounding minimum fuel decay time of 24 hours. Conclusion #1 of the Calculation's cover sheet, page 1 of 45, read:

The irradiated fuel assemblies can be handled in the reactor pressure vessel (RPV) after the reactor has been sub-critical for at least 24 hours. This provides a basis for changing the reactor minimum sub-critical time from 168 hours to 24 hours (Technical Specification Limiting Condition for Operation (LCO) 3.9.3).

On September 24, 2008, the NRC issued Amendment Nos. 289 and 273 for Salem, Unit Nos. 1 and 2, respectively (ADAMS Accession No. ML082340922). The amendments revised the decay time requirements in TS 3/4.9.3 for outage periods falling between October 15 and May 15 from 100 hours to 80 hours as reflected in current TS 3.9.3a.

The Salem UFSAR, Section 15.4.6 (Revision 24, dated May 11, 2009), describes the FHA, in part, as:

The accident is defined as dropping of a spent fuel assembly onto the spent fuel pit floor in the fuel handling building or inside containment resulting in the rupture of the cladding of all the fuel rods in the assembly ...

The Salem UFSAR analysis assumed that the failed fuel decay time considered prior to the accident was 24 hours.

The licensee noted in its June 28, 2019 LAR:

The activities required prior to moving irradiated fuel in the reactor vessel (e.g. RCS [reactor coolant system] cooldown, depressurization, containment entry, removal of the reactor vessel head, removal of reactor vessel internals) require well in excess of 24 hours to complete before irradiated fuel can be moved.

...

A review of Salem Refueling Outage performance for the past 10 years shows that entry into Mode 6 (reactor head de-tensioned) has averaged around 62 hours. The minimum time to reach movement of irradiated fuel in this 10 year period was 91 hours.

The NRC staff notes that NUREG-1431, Volume 1, contains no TSs that mirror Salem, Unit Nos. 1 and 2, TS 3/4.9.3. As a point of comparison, and in agreement with licensee's historical refueling outage performance data, it is noted that NUREG-1431 Volume 2, B 3.9.4, "Containment Penetrations," invokes a minimum decay time of 100 hours prior to irradiated fuel movement to ensure that the release of fission product radioactivity subsequent to an FHA results in doses that are well within the guideline values specified in 10 CFR Part 100. Therefore, the proposed change to TS 3/4.9.3 is supported by the absence of operability and surveillance requirements for the fuel decay time in the Improved STS presented in NUREG-1431. In the June 28, 2019 LAR, the licensee stated:

... during the development of NUREG-1431 it was determined that this specification could be relocated. The basis for this determination was that existing scheduling restraints associated with moving irradiated fuel following a plant shutdown will prevent the decay time limit from being exceeded. ...

In Section 3.2 of the NRC safety evaluation for Amendment Nos. 289 and 273, the NRC documented the following regarding spent fuel pool cooling:

Based on its review, the NRC staff concludes that the proposed change to TS 3.9.3, in conjunction with the operational controls on CCW [component cooling water] temperature specified by the IDHM program; provide reasonable assurance that the decay heat removal capability will be maintained consistent with its importance to safety.

Removing TS 3/4.9.3 and relocating the requirements of TS 3/4.9.3 to the Salem TRM does not negate this conclusion.

However, the FHA analysis of Calculation S-C-ZZ-MDC-1920, Revision 4IR0, used a bounding minimum fuel decay time of 24 hours. The licensee has evaluated the proposed change against the criteria in 10 CFR 50.36 and determined that the decay time TS 3.9.3.a does not meet the criteria for requiring establishment of an LCO. The licensee-performed review of the Salem refueling outage performance for the past 10 years shows that entry into Mode 6 has averaged around 62 hours. The minimum time to reach movement of irradiated fuel in this 10-year period was 91 hours. The start of moving irradiated fuel in the containment or the FHB could not take place within the most restrictive LCO time of 80 hours for TS 3.9.3.a.

The NRC staff concludes TS LCO 3.9.3 is not required to ensure the plant is operated within the bounds of the FHA design-basis analysis because of inherent logistical delays in beginning the movement of irradiated fuel. Therefore, it does not satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii), and the staff concludes that it is acceptable to relocate TS 3/4.9.3 to the Salem TRM.

### 3.2 Deletion of TS 3/4.9.12, "Fuel Handling Area Ventilation System"

The license proposes to delete TS 3/4.9.12 from the Salem, Unit Nos. 1 and 2, Renewed Facility Operating Licenses. The unchanged requirements of TS 3/4.9.12 would be relocated to the Salem TRM (which is a licensee-controlled document).

The Salem UFSAR, Section 15.4.6, "Method of Analysis," Clause 9, reads:

The radioactive material that escapes was assumed to be release to the environment over a two-hour period and no filtration was credited for reduction in the amount of radioactive material released to the environment.

In preparation for Refueling Outage 2R16, the licensee submitted an LAR for Salem, Unit No. 2, dated October 17, 2007, as supplemented by letter dated January 11, 2008 (ADAMS Accession Nos. ML03470363 and ML080230549, respectively). The LAR proposed a one-time revision to the requirements for fuel decay time prior to commencing movement of irradiated fuel. The LAR submittal contained Calculation S-C-ZZ-MDC-1920, Revision 4IR0, "Fuel Handling Accident Radiological Consequences Evaluation," as Attachment 5. The staff approved the change to TS 3/4.9.3 in Amendment No. 271 for Salem, Unit No.2. The amendment allowed a one-time change in fuel decay time from 100 hours to 86 hours during October 15 to May 15.

Section 3.2, "FHA Occurring In Fuel Handling Building," of Calculation S-C-ZZ-MDC-1920, Revision 4IR0, reads, in part:

Since the FHA in the FHB release duration is two hours (Ref. 10.1, Appendix B, RGP B.4.1), the plant vent, FHB rollup doors and smoke hatch 0-2 x/Q values are used to calculate the equivalent 0 to 2 hr x/Q in Section 7.5 for a combined post-FHA release path. The equivalent x/Q is used with the post-FHA unfiltered release from the FHB to calculate the EAB [exclusion area boundary], LPZ [low population zone], and CR [control room] doses.

This calculation specifically stated (i.e., below Assumption 4.8b) that "A reduction in the amount of radioactive material released from the fuel pool by engineered safety feature (ESF) filter systems in not accounted for in the radioactivity release analyses."



The "Calculation Cover Sheet," page 1 of 45, concluded, in part, "The FHA occurring in the FHB provides basis for relaxing the SNGS [Salem] Technical Specification Surveillance requirements 4.9.12b and 4.9.12c."

On March 11, 2008, as supplemented by letters dated June 17, 2008, and July 23, 2008 (ADAMS Accession Nos. ML080930080, ML081790153, and ML082110417, respectively), the licensee submitted an LAR to revise TS 3/4.9.3 for Salem, Unit Nos. 1 and 2. The LAR proposed a revision to the requirements for fuel decay time prior to commencing movement of irradiated fuel in the reactor pressure vessel. The NRC issued Amendment Nos. 289 and 273 revised the decay time requirements in TS 3/4.9.3 for outage periods falling between October 15 and May 15 from 100 hours to 80 hours for Salem, Unit Nos. 1 and 2. The NRC's safety evaluation stated, in part:

... the proposed amendment is based on the identical calculation that supported Salem Unit No.2 Amendment No. 271 (i.e., calculation S-C-ZZ-MDC-1920, revision 4IR0). The 24 hour decay time assumed in the calculation conservatively bounds the proposed TS decay time of 80 hours. As such, the NRC's staff's previous evaluation of the radiological consequences for an FHA for Salem Unit No. 2 Amendment No. 271 is applicable to the proposed amendment for Salem Unit Nos. 1 and 2. Therefore, the proposed amendment is acceptable with respect to radiological consequences.

Subsequent to the NRC's issuance of Amendment Nos. 289 and 273, the licensee revised the FHA dose analysis in accordance with 10 CFR 50.59 to increase the assumption of unfiltered in-leakage entering the control room to bound the results of control room envelope tracer gas testing performed in 2010. The 24-hour fuel decay time and assumptions associated with the FHAVS were not changed.

Review of Calculation S-C-ZZ-MDC-1920, Revision 4IR0, indicates that with respect to the exclusion area boundary, low population zone, and control room, the most severe FHA that might occur in either the containment or the FHB is modeled by a puff release that occurs in the FHB. More specifically, whether the FHAVS is operable or inoperable is not relevant to the most limiting dose consequence FHA analysis.

Paragraph (c)(2)(ii) of 10 CFR 50.36 establishes that a TS LCO of a nuclear reactor must be established for each item meeting one or more of the four criteria of 10 CFR 50.36(c)(2)(ii)(A)-(D) (shown in Section 2.3 of this safety evaluation). Note that per 10 CFR 50.36(c)(2)(iii), a licensee is not required to propose to modify TS that are included in any license issued before August 18, 1995, to satisfy the four criteria 10 CFR 50.36(c)(2)(ii)(A)-(D). The staff's analysis of each criterion follows:

#### Criterion 1

The FHAVS is not used to detect degradation of any type associated with the reactor coolant pressure boundary. Therefore, a TS LCO is not required by 10 CFR 50.36(c)(2)(ii)(A) (i.e., Criterion 1).

#### Criterion 2

The operation of the FHAVS during an FHA in the FHB is not a process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or

transient analysis. The FHA is assumed to occur from the dropping of spent fuel assembly onto the spent fuel pit floor or inside the containment, resulting in the rupture of the cladding of all the fuel rods in the assembly. As stated above, with respect to the exclusion area boundary, low population zone, and control room, the most severe FHA that might occur in either the containment or the FHB is modeled by a puff release that occurs in the FHB. Therefore, whether the FHAVS is operable or inoperable is not relevant to the most limiting dose consequence FHA analysis. Therefore, this specification does not satisfy Criterion 2 for retention in the Salem TSs.

### Criterion 3

The operation of the FHAVS in the FHB is not required to function or actuate to mitigate the FHA. Whether the FHAVS is operable or inoperable is not relevant to the most limiting dose consequence FHA analysis. Analysis has demonstrated that when the FHAVS is not in service, the dose consequences of an FHA are well within the limits of 10 CFR 50.67. Therefore, a TS LCO is not required by 10 CFR 50.36(c)(2)(ii)(C) (i.e., Criterion 3).

### Criterion 4

The FHAVS is not a risk-significant system. Analysis has demonstrated that when the FHAVS is not in service, the dose consequences of an FHA are well within the limits of 10 CFR 50.67. Therefore, a TS LCO is not required by 10 CFR 50.36(c)(2)(ii)(D) (i.e., Criterion 4).

For the reasons above, the NRC staff concludes that LCO 3/4.9.12 does not meet any of the criteria of 10 CFR 50.36(c)(2)(ii)(A)-(D), and can be relocated to the Salem TRM.

### 3.3 Index - Limiting Conditions for Operation and Surveillance Requirements

This is an administrative change that follows from the NRC staff's conclusions of Sections 3.1.1 and 3.1.2. The staff concludes that the proposed change to TS page IX, "Index," for Units No. 1 and 2 (i.e., to delete the references to TSs 3/4.9.3 and 3/4.9.12), is acceptable.

### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Jersey State official was notified of the proposed issuance of the amendments on October 24, 2019. The State official had no comments.

### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, published in the Federal Register on August 13, 2019 (84 FR 40098), and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set

forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

## 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: D. Nold  
E. Dickson

Date: March 12, 2020

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 – ISSUANCE OF AMENDMENT NOS. 334 AND 315 RE: RELOCATE TECHNICAL SPECIFICATIONS 3.9.3 AND 3.9.12 TO TECHNICAL REQUIREMENTS MANUAL (EPID L-2019-LLA-0143) DATED MARCH 12, 2020

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 DNold, NRR

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\*by memorandum

\*\*by e-mail

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