



10 CFR 50.90

LR-N22-0092
LAR S22-02

December 9, 2022

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Salem Generating Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Subject: **Response to Final IOLB Request for Additional Information for Salem LAR to Revise TS to Extend Allowed Outage Time for Inoperable EDG (EPID L-2022-LLA-0095)**

- References:
1. PSEG letter to NRC, "License Amendment Request to Amend Salem Unit 1 and Unit 2 Technical Specifications (TS) to Extend the Allowed Outage Time for an Inoperable Emergency Diesel Generator from 72 hours to 14 Days," dated June 29, 2022 (ADAMS Accession No. ML22180A268)
 2. NRC e-mail to PSEG, "Salem 1 and 2 - Final IOLB RAI for Salem LAR to Revise TS to Extend Allowed Outage Time for Inoperable EDG (EPID L-2022-LLA-0095)," dated November 29, 2022, (ADAMS Accession No. ML22333A902)

In the Reference 1 letter, PSEG Nuclear LLC (PSEG) submitted a license amendment request (LAR) for Salem Generating Station Units 1 and 2 (Salem). The proposed amendment would revise Salem Technical Specification (TS) Action 3.8.1.1.b.4 to extend the allowed outage time (AOT) for an inoperable emergency diesel generator (EDG) from 72 hours to 14 days.

In Reference 2, the U.S. Nuclear Regulatory Commission staff provided PSEG a Request for Additional Information (RAI) to support the NRC staff's detailed technical review of Reference 1. The attachment to this letter contains the responses to the RAI question contained in Reference 2.

PSEG has determined that the information provided in this submittal does not alter the conclusions reached in the 10 CFR 50.92 no significant hazards determination previously submitted. In addition, the information provided in this submittal does not affect the bases for

concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no regulatory commitments contained in this letter.

If you have any questions or require additional information, please contact Mr. Michael Wiwel at 856-339-7907.

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

Executed on 12/09/2022
(Date)

Respectfully,



David Sharbaugh
Vice President – Salem Generating Station
PSEG Nuclear LLC

Attachment: Response to Final ILOB Request for Additional Information for Salem LAR to Revise TS to Extend Allowed Outage Time for Inoperable EDG (EPID L-2022-LLA-0095)

cc: Administrator, Region I, NRC
NRC Project Manager
NRC Senior Resident Inspector, Salem
Ms. A. Pfaff, Manager, NJBNE
PSEG Corporate Commitment Tracking Coordinator
Station Commitment Tracking Coordinator

Attachment 1

**Response to Final ILOB Request for Additional Information for Salem LAR to Revise TS
to Extend Allowed Outage Time for Inoperable EDG (EPID L-2022-LLA-0095)**

BACKGROUND

By application dated June 29, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22180A268), PSEG Nuclear (the licensee) requested a change to the Technical Specifications (TSs) for Salem Generating Station, Units 1 and 2 (Salem). The proposed change would modify TS Action 3.8.1.1.b.4 to extend the allowed out of service time for an inoperable emergency diesel generator (EDG) from 72 hours to 14 days.

NRC CONSIDERATION OF RISK INSIGHTS FOR NON RISK-INFORMED SUBMITTAL

The proposed amendment is not a risk-informed amendment submitted in accordance with Regulatory Guide 1.174. Therefore, the NRC staff does not review the licensee's probabilistic risk assessment models to determine their technical acceptability. The NRC staff reviewed the submittal in accordance with NUREG 1764 to determine the necessary level of review (I, II, or III as indicated in NUREG 1764). The HFE staff used input from the licensee submittal and insights from NRC risk analysts. The NRC staff considers the licensee-provided qualitative risk insights and associated compensatory measures in its Qualitative Assessment of Human Action Safety-Significance of the proposed change.

RAI IOLB-1: Risk Insights Identified During the Risk Assessment

The licensee states that the proposed amendment is deterministic and was developed using the guidelines in Branch Technical Position 8-8, "Onsite (Emergency Diesel Generators) and Offsite Power Sources Allowed Outage Time Extensions." The licensee also states that additional risk insights reflecting the change in the allowed outage time (AOT) are provided.

Section 3.10, "Operator Actions," of the enclosure to the LAR, the licensee provides a general overview of the actions required to connect, start and align the AOT diesels. It states that the actions are based on the established procedures in place for use of the same AOT diesel generators at Hope Creek.

Section 3.6, "Supplemental AC Power Source for Extended AOT," of the enclosure to the LAR describes the results how the supplemental AC power source is required to be available throughout the extended TS AOT such that it can provide AC power to the vital bus impacted by the EDG outage. It describes the proposed supplemental AC power source, which consist of two portable, trailer mounted diesel generators that will be synchronized and connected to one of two receptacle panels, one for each Salem unit.

The staff considered the change to human actions (HA) necessary to provide the designated supplemental AC Power Source presented in the submittal. As the proposed amendment is not risk-informed, the staff began the screening process to assess the safety significance of the identified actions by reviewing NUREG-1764. The guidance document designates recovering AC power by either manual transfer of the source of offsite power, or recovery of onsite normal/emergency AC power as PWR Potentially Risk-Important Human Actions. Due to the potential risk, the staff further screened the identified HA and the associated TS changes.

Please address the following:

- a. Does the requested change adversely affect the performance of an action that was previously identified as problematic based on experience/events at that plant or plants of similar design?
- b. Does the requested change introduce new HAs (HAs not previously modeled generically or in a plant-specific PRA)?
- c. Has the requested change given personnel a new functional responsibility that they previously did not have, and which differs from their normal responsibilities?
- d. Has the requested change significantly modified the way in which personnel perform their tasks (e.g., making them more complex, significantly reducing the time available to perform the action, increasing the operator workload, changing the operator role from primarily "verifier" to primarily "actor")?
- e. Has the requested change significantly increased the level of communication needed to perform the task?
- f. Has the requested change significantly changed the team aspects of performing an action?

Response to RAI IOLB-1

- a. The plant staff actions associated with placing the supplemental power source (i.e. AOT diesel generators) into service are similar in nature to those plant actions that already exist relative to operator response strategies associated with a Station Blackout (SBO) event as well as placing FLEX equipment into service to address beyond design basis events (e.g. Fukushima Actions). These beyond design basis response strategies include transporting and connecting portable diesel generators for powering essential loads such as battery chargers or breaker controls. While use of the AOT diesel generators shares similarities with FLEX and SBO response strategies, it represents a new and separate Human Action (HA) specifically targeted for use during extended online Emergency Diesel Generator (EDG) outages.

There have been no problematic issues identified by operating and support personnel associated with implementing the procedures that govern the actions associated with FLEX and SBO response strategies. There have been minor issues identified with the portable equipment used in these activities. These equipment issues have typically been identified during routine walkdowns, testing and preventative maintenance activities and have been straight forward to address (e.g. tire inflation, addition of fuel and lubricating oil to equipment).

As described in the subject License Amendment Request (LAR), the AOT diesel generators will be shared between Hope Creek and Salem stations. The operational and procedural experience obtained from use of the AOT diesel generators at Hope Creek are being leveraged for their use at Salem station. No problematic issues have been identified relative to the routine testing or maintenance of these AOT diesels nor in the Branch Technical Position (BTP) 8-8 protocols associated with crediting the AOT diesels during extended EDG outages at Hope Creek.

- b. The requested change will introduce a new HA that is analogous to several HA's previously modeled in the Salem PRA. Use of the AOT diesel generators shares many similarities with use of the FLEX diesel generators and the SBO diesel generators described below in response 'c', which are modeled in the Salem PRA. Similarities include applicable scenarios, personnel staffing, execution tasks, training, environmental conditions, and perceived execution stress by the plant staff directed to align the equipment. The planned procedures and validation effort are expected to be highly similar to those related to the Salem FLEX equipment and to the use of the same AOT diesel generators at Hope Creek.
- c. The functional responsibilities for staging, connecting, starting and loading the AOT diesel generators represent an additional set of tasks to the Salem plant organization, however the activities are not new or especially unique in nature. The established FLEX strategies require the deployment and connection of portable electrical generators to supply power to critical loads following a beyond design basis event such as an extended loss of AC Power (ELAP). These strategies require the trailering and staging of portable generators by plant personnel, connection of the generators by maintenance personnel and ultimately generator startup and breaker manipulations by operators to provide power to vital loads such as battery chargers. Examples of these evolutions are found in the following station procedures:
- SH.OP-AM.FLX-0050, "Pre-Storm Storage and Protection of Outdoor Flex Equipment" which provides direction for plant staff to transport FLEX equipment to established shelters upon severe weather or natural disaster guideline FLEX trigger points.
 - SH.OP-AM.FLX-0051, "Salem/Hope Creek Shared Flex Equipment Phase 2 Deployment" which directs the access, trailering and ultimate staging of equipment in response to an ELAP event.
 - S1(2).OP-FS.FLX-0005, "Initial Assessment and Flex Equipment Staging," which directs the connection and operation of the equipment in preparation for use in plant recovery.

These procedures entail towing and/or staging and connecting equipment such as 480V diesel generators for backfeeding battery chargers and 230V MCC restoration and a diesel driven pump to supply the service water header from the Delaware River. Towing, staging and connection of larger (4kV) diesel generators obtained through the National SAFER Response Center(s) are also proceduralized actions as part of the station's FLEX strategy that are very similar in nature to those associated with use of the AOT diesel generators.

Similar operational tasks are performed in the event of an SBO condition and are directed by the following station procedures:

- S1(2).OP-AB.LOOP-0001, "Loss of Offsite Power," and S1(2).OP-SO.500-0125, "SBO Diesel – Vital Battery Chargers," are in place for station operators to activate standby electrical equipment such as a dedicated diesel driven air

compressor and a dedicated, portable SBO diesel to provide backup power to battery chargers.

- SC.OP-SO.500-0125, "SBO Diesel – Miscellaneous Switchyard," provides direction to trailer a SBO diesel generator to the 500kV switchyard, connect and start the diesel to provide power to 500kV switchyard breaker controls.

These and other established SBO response strategies that entail operator and plant staff actions similar in nature to staging and use of the AOT diesel generators are discussed in section 3.3 of the LAR. Although much of the SBO/FLEX equipment described above are smaller than the AOT diesel generators, the evolution of staging, connection and diesel startup and breaker manipulations are similar in nature to those already established for the plant.

Training on the connection and operation of the AOT diesels will be provided to appropriate plant personnel and a time validation of the staging and connection/backfeed evolution will be performed prior to implementation of the proposed Technical Specification (TS) amendment. In addition, re-familiarization of the associated procedures through pre-job briefs will be included as part of the pre-planned evolution of an extended EDG outage.

Based on the above established, procedurally directed SBO/FLEX response activities and their similarity to the activities tied to establishing the AOT diesel generators to backfeed a vital bus, the use of the AOT diesels is not considered to introduce new functional responsibilities for site organizations.

- d. As discussed in the above response to question 'c', the evolution associated with staging, connecting and backfeeding a vital 4kV bus via the AOT diesel generators is not significantly different than those operator, maintenance and plant staff actions proceduralized for staging and use of SBO and FLEX equipment. Deployment and alignment of the AOT diesel generators would have a context similar to an ELAP scenario, for which qualified plant staff (Operations, Yard Services, and Maintenance) are trained and briefed. The performance shaping factors for the assigned tasks are not much different than those the staff would experience as part of an ELAP response. The activities involved (e.g. hauling the diesel trailers and cable reels, plugging in cables, starting the diesels and performing breaker manipulations) are not unique unto themselves when compared to activities already performed by station organizations. These types of activities are routinely performed during both normal operations (such as routine testing of the AOT diesels) and abnormal conditions as directed by the procedures described above in response 'c'. Based on the routine testing performed on the AOT diesels as well as the pre-engineered connections to accommodate the 4kV backfeed, certain tasks associated with use of the AOT diesels are in some ways less complex than the other similar actions described for use of equipment to respond to SBO and beyond design basis (i.e. FLEX) events.

Although performance of these AOT diesel generator activities is not part of the routine work load of operator and station support personnel, planned EDG outages that will credit the AOT diesels will ensure the availability of trained and briefed personnel in the event the AOT diesels will need to be placed into service. Therefore, in the event the

AOT diesels are needed to be placed in service, adequate staffing of qualified personnel will be available to perform the actions to establish the AOT diesels within the required three-hour time frame. Finally, execution of the AOT staging and simulated connection and vital bus backfeed will be time validated prior to implementation of the TS amendment to allow extended EDG outages beyond 72 hours.

- e. The actions associated with staging and connecting the AOT diesel generators and backfeeding the affected vital 4kV bus will require direct communication from the operating staff in the main control room. Operations staff in the main control room will maintain command and control of events that would necessitate use of the AOT diesels to backfeed a vital bus (i.e. a loss of offsite power coincident with failure of an EDG). All communications from the main control room to non-licensed operators, and maintenance and support staff will take place via established protocols and equipment (e.g. plant radios, mobile "spectra-link" phones and/or the plant page). This established chain of communications is no different than those established in the procedures described above in response 'c' regarding staging and using FLEX and SBO equipment. The activities described in response 'c' involve coordinating the following plant personnel:
- Yard Services personnel (i.e. material handlers) to transport the AOT diesels to the connection staging area.
 - Operators and Yard Services personnel to transport support equipment (cable reels and refueling cubes) and Maintenance technicians to connect the equipment to the required loads/electrical buses.
 - Operators to start the AOT diesel generators and perform the associated breaker manipulations to backfeed the required vital bus.

The above described activities required to stage and use the AOT diesel generators require essentially the same level of communications between the main control room and designated plant staff as those activities delineated in response 'c' above.

Therefore, the AOT diesel generator staging, connection and backfeed activities described in Attachment 5 of the LAR do not represent a greater amount or complexity of communications than what currently exist in established off-normal, accident and beyond design basis mitigating procedures.

- f. The team aspects associated with staging and using the AOT diesel generators are no different than the team aspects associated with any number of actions required for normal and off-normal plant operations. Coordination of Operations, Maintenance and station support personnel occur on a daily basis as part of plant operations as well as during response to abnormal conditions. The established sequence of steps and division of responsibility to stage and use the AOT diesel generators are in line with those found in the SBO/FLEX response procedures described above in response 'c'.

Deployment and alignment of the AOT diesel generators will be executed by a team of site personnel across multiple departments. There will be briefed and designated plant staff available should Operations direct the AOT diesel generators be placed into

service. The deployment of the AOT diesel generators, connection cables, starting of the AOT diesels and final breaker manipulations will be performed under conditions similar to an SBO/ELAP event using procedures and administrative controls that are similar to current station responses using the SBO or FLEX diesels.

Prior to implementing the proposed TS amendment, the procedural steps associated with staging, connecting, and starting the AOT diesels and simulated breaker operations to backfeed a vital bus will be time validated. Establishment and refinement of team member responsibilities will be a key focus during this in-field validation. In addition to validating the AOT diesel procedures, planned implementation of an extended EDG AOT will entail a re-familiarization of the activities via pre-job briefs for those plant personnel that would be supporting the extended AOT. These pre-job briefs will reinforce the knowledge base and division of responsibilities of the team prior to entering the extended EDG AOT period where the team would expect to execute the steps required to deploy the AOT diesels. Finally, like Hope Creek, the validated procedural steps will be maintained as a time critical action per Salem procedure OP-SA-102-106, "Salem Operations Master List of Timed Actions." Therefore, there is no fundamental change to the team aspects of the station relative to deploying the AOT diesel generators when called upon during an extended EDG AOT.