



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

October 28, 2021

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

**SUBJECT: HOPE CREEK GENERATING STATION AND SALEM NUCLEAR
GENERATING STATION, UNITS 1 AND 2 – BIENNIAL PROBLEM
IDENTIFICATION AND RESOLUTION INSPECTION REPORT
05000354/2021012, 05000272/2021012 AND 05000311/2021012**

Dear Mr. Carr:

On September 17, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution inspection at your Hope Creek Generating Station (Hope Creek) and Salem Nuclear Generating Station, Units 1 and 2 (Salem) and discussed the results of this inspection with Mr. Charles Mcfeaters, Senior Vice President of Nuclear Operations, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspection team reviewed Hope Creek's and Salem's corrective action program and the station's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the station was complying with NRC regulations and licensee standards for corrective action programs. The team also evaluated Hope Creek and Salem's processes for use of industry and NRC operating experience information and the effectiveness of the station's audits and self-assessments. Based on the samples reviewed, the team determined that your staff's performance in each of these areas was generally effective and adequately supported nuclear safety.

Finally, the team reviewed Hope Creek and Salem's programs to establish and maintain a safety-conscious work environment, and interviewed station personnel to evaluate the effectiveness of these programs. Based on the team's observations and the results of these interviews the team found no evidence of challenges to your organization's safety-conscious work environment. Your employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

Three findings of very low safety significance (Green) are documented in this report. Two of these findings involved violations of NRC requirements. The inspectors also identified one security finding of very low security significance (Green) involving a violation of NRC requirements. Further, the inspectors noted a PSEG-identified security violation which was determined to be of very low security significance. The NRC is treating all of these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

Additionally, the security-related NCVs are documented separately in NRC Inspection Report 05000354/2021403, 05000272/2021403 and 05000311/2021403 because the NCVs contain security-related information and cannot be made publicly available in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390(d)(1).

If you contest the violation or the significance or severity of the violation or a cross-cutting aspect assignment documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspectors at Hope Creek and Salem.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

Brice A. Bickett, Chief
Reactor Projects Branch 3
Division of Operating Reactor Safety

Docket Nos. 05000354, 05000272 and 05000311
License Nos. NPF-57, DPR-70 and DPR-75

Enclosure:
As stated

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SUBJECT: HOPE CREEK GENERATING STATION AND SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2 – BIENNIAL PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT 05000354/2021012, 05000272/2021012 AND 05000311/202101 DATED OCTOBER 28, 2021

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000354, 05000272 and 05000311

License Numbers: NPF-57, DPR-70 and DPR-75

Report Numbers: 05000354/2021012, 05000272/2021012 and 05000311/2021012

Enterprise Identifier: I-2021-012-0028
I-2021-012-0027

Licensee: PSEG Nuclear, LLC

Facility: Hope Creek and Salem Nuclear Generating Stations

Location: Hancocks Bridge, NJ

Inspection Dates: August 30, 2021 to September 17, 2021

Inspectors: J. Hawkins, Senior Resident Inspector
P. Finney, Senior Project Engineer
L. Cline, Senior Project Engineer
J. Bream, Reactor Operations Engineer
D. Beacon, Resident Inspector
C. Crisden, Allegations/Enforcement Specialist
G. Walbert, Reactor Engineer

Approved By: Brice A. Bickett, Chief
Reactor Projects Branch 3
Division of Operating Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting a biennial problem identification and resolution inspection at Hope Creek and Salem Nuclear Generating Stations in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. Additionally, in the sections documenting the inspection below, the inspectors designated specific Hope Creek, Salem, and Common observations and results using (H), (S), and (C), respectively.

List of Findings and Violations

High Pressure Coolant Injection Trip Pressure Control Valve Exceeded Service Life (H)			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000354/2021012-01 Open/Closed	[P.2] - Evaluation	71152B
The inspectors identified a Green finding because PSEG (Hope Creek) did not properly implement the requirements of their CC-AA-11 procedure for Nonconforming Materials, Parts or Components, Revision 6, associated with the high pressure coolant injection (HPCI) turbine overspeed trip reset pressure control valve (PCV). Specifically, PSEG did not follow this procedure for dispositioning and technically justifying the HPCI PCV nonconformance, which resulted in the installed HPCI PCV exceeding its 5-year service life by more than 16 years.			
Inadequate Review of Excess Flow Check Valve Testing Procedures (H)			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000354/2021012-02 Open/Closed	[H.8] - Procedure Adherence	71152B
A self-revealed Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was identified when PSEG (Hope Creek) implemented Revision 7 of their Excess Flow Check Valve testing procedures, HC.IC-FT.BB-0066(Q) and HC.IC-FT.BB-0067(Q), without adequate procedure revision reviews in accordance with station procedures AD-AA-101, step 4.5.7, and AD-AA-102, Attachment 2, for procedural revisions. Specifically, when implemented in the field during Hope Creek refueling outage H1R23, inadequacies in the revised procedure methodologies directly caused reverse pressurization of the reactor recirculation pump (RRP) seals, which impacted the #1 seal on both the ‘A’ RRP and the ‘B’ RRP. This ultimately required the station to perform a maintenance outage to replace both seal packages shortly after starting up from H1R23.			

Inadequate Corrective Actions for Limit Switch Environmental Qualified Life (S)			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000272, 05000311/2021012-03 Open/Closed	[P.2] – Evaluation	71152B
<p>The inspectors identified a Green finding and associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," when PSEG (Salem) did not ensure that a condition adverse to quality (CAQ) associated with a deviation from analyzed temperature for a main steam isolation valve (MSIV) limit switch (L/S) was promptly identified and corrected. Specifically, temperature monitoring data for the 12MS167 MSIV L/S logged between January and August 2021, indicated that this L/S exceeded the assumed average temperature in the environmental qualification (EQ) life calculation. PSEG did not identify and correct this CAQ and re-evaluate the EQ life for this MSIV L/S which was determined to have exceeded its EQ life.</p>			

Additional Tracking Items

None.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), inspectors were directed to begin telework. In addition, regional baseline inspections were evaluated to determine if all or a portion of the objectives and requirements stated in the IP could be performed remotely. The following inspection activities were conducted in accordance with the IP on site. The inspections documented below met the objectives and requirements for completion of the IP.

OTHER ACTIVITIES – BASELINE

71152B - Problem Identification and Resolution

Biennial Team Inspection (IP Section 02.04) (1 Sample (Hope Creek) & 1 Sample (Salem))

- (1) The inspectors performed a biennial assessment of PSEG's corrective action program, use of operating experience, self-assessments and audits, and safety conscious work environment.
 - Corrective Action Program Effectiveness: The inspectors assessed the corrective action program's effectiveness in identifying, prioritizing, evaluating, and correcting problems. The inspectors also conducted a five-year review of the Hope Creek Emergency Diesel Generators (EDGs), High Pressure Coolant Injection (HPCI), and Reactor Core Isolation Cooling (RCIC) systems. The inspectors also conducted a five-year review of the Salem Service Water (SW) and Auxiliary Feedwater (AFW) systems.
 - Operating Experience, Self-Assessments and Audits: The inspectors assessed the effectiveness of the station's processes for use of operating experience, audits and self-assessments.
 - Safety Conscious Work Environment: The inspectors assessed the effectiveness of the station's programs to establish and maintain a safety conscious work environment.

INSPECTION RESULTS

Note: The inspectors designated specific Hope Creek, Salem, and Common inspection results (findings and observations) using (H), (S), and (C), respectively.

Assessment	71152B
Corrective Action Program Effectiveness –	
<p>The inspectors determined that PSEG’s corrective action program for Salem and Hope Creek was generally effective and adequately supported nuclear safety and security.</p>	
<p><u>Problem Identification:</u> The inspectors determined that, in general, PSEG identified issues and entered them into the corrective action program at a low threshold. However, the inspectors identified one Green non-cited violation (NCV) and noted several observations associated with problem identification. Additional details are documented below.</p>	
<p><u>Problem Prioritization and Evaluation:</u> Based on the samples reviewed, the inspectors determined that, in general, PSEG appropriately prioritized and evaluated issues commensurate with the safety significance of the identified problem. PSEG appropriately screened NOTFs for operability and reportability, categorized NOTFs by significance, and assigned actions to the appropriate department for evaluation and resolution. However, the inspectors identified one Green NCV, one Green Finding, and noted several observations associated with problem evaluation. Additional details are documented below.</p>	
<p><u>Corrective Actions:</u> The inspectors determined that, in general, the overall corrective action program performance related to resolving problems was effective. In most cases, PSEG implemented corrective actions to resolve problems in a timely manner. However, the inspectors identified one Green NCV and noted several observations associated with corrective actions. Additional details are documented below.</p>	

Assessment	71152B
Use of Operating Experience –	
<p>The team determined that PSEG appropriately evaluated industry operating experience for its relevance to the facility. PSEG appropriately incorporated both internal and external operating experience into plant procedures and processes, as well as lessons learned for training and pre-job briefs. However, the inspectors identified several observations associated with operating experience. Additional details are documented below.</p>	
Self-Assessments and Audits –	
<p>The team reviewed a sample of self-assessments and audits to assess whether PSEG was identifying and addressing performance trends. In general, the team concluded that PSEG had an effective self-assessment and audit process. However, the inspectors identified one licensee-identified violation (LIV) and noted several observations with PSEG’s self-assessments and audits. Additional details are documented below.</p>	

Assessment	71152B
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Safety Conscious Work Environment –

The team interviewed site personnel across different functional areas to determine the adequacy of the safety conscious work environment. The purpose of these interviews was (1) to evaluate the willingness of the licensee staff to raise nuclear safety issues, (2) to evaluate the perceived effectiveness of the corrective action program at resolving identified problems, and (3) to evaluate the licensee's safety conscious work environment. The personnel interviewed were randomly selected by the inspectors from the Operations, Engineering, Maintenance, Security, Chemistry, Radiation Protection, and Emergency Preparedness work groups. To supplement these discussions, the team interviewed the Employee Concerns Program (ECP) Coordinator to assess their perception of the site employees' willingness to raise nuclear safety concerns. The team also reviewed the ECP case log and select case files. All individuals interviewed indicated that they would raise safety concerns.

All individuals felt that their management was receptive to receiving safety concerns and generally addressed them promptly, commensurate with the significance of the concern. In general, interviewees indicated they were adequately trained and proficient on initiating NOTFs. All interviewees were aware of the licensee's ECP, stated they would use the program if necessary, and expressed confidence that their confidentiality would be maintained if they brought issues to the ECP. When asked whether there have been any instances where individuals experienced retaliation or other negative reaction for raising safety concerns, all individuals interviewed stated that they had neither experienced nor heard of an instance of retaliation at the site. The team determined that the processes in place to mitigate potential safety culture issues were adequately implemented.

High Pressure Coolant Injection Trip Pressure Control Valve Exceeded Service Life (H)

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000354/2021012-01 Open/Closed	[P.2] - Evaluation	71152B

The inspectors identified a Green finding because PSEG (Hope Creek) did not properly implement the requirements of their CC-AA-11 procedure for Nonconforming Materials, Parts or Components, Revision 6, associated with the high pressure coolant injection (HPCI) turbine overspeed trip reset pressure control valve (PCV). Specifically, PSEG did not follow this procedure for dispositioning and technically justifying the HPCI PCV nonconformance, which resulted in the installed HPCI PCV exceeding its 5-year service life by more than 16 years.

Description: On May 13, 2021, PSEG documented notification (NOTF) 20877063 for the HPCI PCV exceeding its 5-year installed service life because of the material susceptibility of the internal diaphragm. This NOTF was the result of a PSEG operating experience review in NOTF 20869737 where the failure of this PCV's internal diaphragm resulted in another station's HPCI system being declared inoperable for greater than the technical specification allowed outage time.

The inspectors reviewed NOTF 20877063 and found that it was screened and coded as a condition adverse to quality (CAQ). PSEG's NOTF created actions (ACITs), not corrective actions, to 1) replace the diaphragm in the spare PCV, and 2) generate a preventive

maintenance change request (PCR) to create a preventive maintenance to replace the PCV's internal diaphragm (70217855) at a 6-year frequency. The inspectors noted that PSEG did not create a corrective action program coded corrective maintenance order to ensure the replacement of the installed HPCI PCV. PSEG's corrective action program procedure, LS-AA-125, Step 4.4.4, states to "CREATE a CRCA in SAP for any planned action necessary to restore a CAQ that is not tracked in an approved process (i.e., CM order or other process.)" The inspectors discussed this with PSEG and found that PSEG had coded the NOTF to the outage scoping process as a priority 7 issue, or lowest priority level. On June 14, 2021, PSEG determined the spare and installed HPCI PCVs were not repairable and that the spare valve was over 21 years old and needed to be replaced. The PCR was approved on the same day creating a 72 month, or 6 year, preventive maintenance to replace the installed HPCI PCV.

During their review of PSEG's NOTFs and actions for this nonconforming issue, the inspectors found that PSEG did not perform any additional analysis or technical justification to accept the identified non-conformance to allow the PCV to remain installed in the plant past its service life which is contrary to CC-AA-11, Step 4.2.3. PSEG documented these issues in NOTFs 20884332* and 20884254*.

Based on the above information, the inspectors determined that PSEG did not properly implement the requirements of their procedure, CC-AA-11, for a nonconforming condition associated with the HPCI PCV. Specifically, PSEG did not follow their procedure for dispositioning and technically justifying the HPCI PCV nonconformance, which resulted in the installed HPCI PCV exceeding its 5-year service life by more than 16 years.

Corrective Actions: PSEG's corrective actions included documenting the above concerns in their corrective action program, re-performing a review of industry operating experience involving failures of this PCV, and completing a technical evaluation to justify the installed PCV remaining in the system until the next opportunity to replace the valve.

Corrective Action References: 20877063, 20877189*, 20883569*, 20884332*, 20884254*, 20884430*, 20884242*, 20883569*, 70216566

Performance Assessment:

Performance Deficiency: PSEG did not follow their procedure for a nonconforming HPCI PCV which was identified to have exceeded the 5-year installed service life was a performance deficiency that should have been foreseen and prevented.

Screening: The inspectors determined the performance deficiency was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. The inspectors screened this performance deficiency in accordance with IMC 0612, Appendix B, "Issue Screening Directions," and determined it to be more than minor because if left uncorrected, the performance deficiency has the potential to lead to a more significant safety concern. Specifically, exceeding the 5-year installed service life replacement interval for the installed HPCI PCV without an adequate technical justification to support operation until the next refueling outage, after already exceeding the PCV's service life by sixteen years, caused reasonable doubt on the continual ability of the HPCI PCV to perform its safety-related function.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Exhibit 2, "Mitigating

Systems Screening Questions,” of IMC 0609, Appendix A, they determined this finding was of very low safety significance (Green) because “Yes” was not answered to any of the screening questions.

Cross-Cutting Aspect: P.2 - Evaluation: The organization thoroughly evaluates issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. The inspectors determined that the finding had a cross-cutting aspect of Evaluation within the cross-cutting area of Problem Identification and Resolution because PSEG failed to adequately evaluate the nonconformance associated with the HPCI PCV.

Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding.

Inadequate Review of Excess Flow Check Valve Testing Procedures (H)

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000354/2021012-02 Open/Closed	[H.8] - Procedure Adherence	71152B

A self-revealed Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” was identified when PSEG (Hope Creek) implemented Revision 7 of their Excess Flow Check Valve testing procedures, HC.IC-FT.BB-0066(Q) and HC.IC-FT.BB-0067(Q), without adequate procedure revision reviews in accordance with station procedures AD-AA-101, step 4.5.7, and AD-AA-102, Attachment 2. Specifically, when implemented in the field during Hope Creek refueling outage H1R23, inadequacies in the revised procedure methodologies directly caused reverse pressurization of the reactor recirculation pump (RRP) seals, which impacted the #1 seal on both the ‘A’ RRP and the ‘B’ RRP. This ultimately required the station to perform a maintenance outage to replace both seal packages shortly after starting up from H1R23.

Description: During start-up from refueling outage H1R23, on May 15, 2021, reactor operators identified that the ‘A’ and ‘B’ RRP #2 seal cavity pressures were elevated. Each RRP operates with a seal package containing two 100% redundant seals, each capable of performing the function of preventing pressurized reactor coolant system (RCS) water from leaking into primary containment. Elevated #2 seal cavity pressure indicates that the #1 seal is no longer performing its sealing function. Evaluation of plant data revealed that the elevated #2 seal pressure trend began on May 8, 2021, coincident with the performance of the ‘A’ and ‘B’ RRP second stage seal pressure instrument line excess flow check valve (EFCV) surveillance testing. On May 16, 2021, the ‘B’ RRP #2 seal cavity pressure decreased and stabilized at the expected pressure for normal operation, indicating that the #1 seal had restaged. However, the ‘A’ RRP #2 seal cavity pressure remained elevated. Subsequent failure of the ‘A’ RRP #2 seal would have resulted in conditions similar to a small-break loss of coolant accident. This is significant because high drywell pressure conditions could develop which would result in primary containment isolation, activation of emergency core cooling systems, and would require an “Alert” emergency declaration. A planned maintenance outage was completed on May 28, 2021, during which the seal packages on both the ‘A’ and ‘B’ RRP were replaced.

PSEG initiated an investigation on the degradation of the RRP seals and determined the direct cause of the seal failures to be inadvertent reverse pressurization of the seals during EFCV testing completed in H1R23. The root cause was determined to be associated with

Revision 7 to HC.IC-FT.BB-0066(Q) and HC.IC-FT.BB-0067(Q), the procedures used to perform the EFCV testing. Specifically, during the revision process, PSEG failed to identify that a proposed change in the test methodology would lead to reverse pressurization of the RRP seals. Additionally, review and validation activities, required by PSEG procedures AD-AA-101, step 4.5.7, and AD-AA-102, Attachment 2, were not adequately completed. This allowed the inadequate procedure to be implemented in the field, which caused the RRP seals to be reverse pressurized, and led to the failure of at least one RRP seal.

Corrective Actions: The RRP seal packages were both replaced during a planned maintenance outage (P211HC) that was completed on May 28, 2021. The EFCV testing procedures were revised to prevent reverse pressurization of RRP seals during EFCV testing in the future. AD-AA-102 was revised to further drive consideration for cross-discipline reviews, and to drive an increased focus on system interfaces, component interfaces, and changes in methodology during the procedure revision process.

Corrective Action References: 20877103, 70217929

Performance Assessment:

Performance Deficiency: PSEG failed to identify that the methodology changes implemented in Revision 7 to HC.IC-FT.BB-0066(Q) and HC.IC-FT.BB-0067(Q) would lead to reverse pressurization of the RRP seals, which could damage the seals. Additionally, PSEG did not perform adequate procedure revision reviews in accordance with station procedures AD-AA-101, step 4.5.7, and AD-AA-102, Attachment 2. This was a performance deficiency that should have been foreseen and prevented.

Screening: The inspectors screened this performance deficiency in accordance with IMC 0612, Appendix B, "Issue Screening Directions," and determined it to be more than minor because it was associated with the Procedure Quality attribute of the Barrier Integrity cornerstone and adversely impacted the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the performance deficiency led to the failure of at least one RRP seal, which is an active component of the RCS boundary, and resulted in a loss of redundancy in the seal package.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The finding was characterized under IMC 0609, Attachment 04, "Initial Characterization of Findings" by answering the questions in Table 3, sections A through E. The inspectors assessed the significance of the finding using both IMC 0609, Appendix A, Exhibit 1, and IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," Attachment 1, Exhibit 2, because the impacted RRP seal conditions manifested during the H1R23 outage (shutdown conditions) and remained during the subsequent plant start-up and at-power operation. In both cases, the inspectors screened the issue to Green because no RCS leakage or loss of inventory event occurred.

Cross-Cutting Aspect: H.8. Procedure Adherence. Individuals follow processes, procedures, and work instructions. The inspectors determined that the finding had a cross-cutting aspect of Procedure Adherence within the cross-cutting area of Human Performance because PSEG failed to adequately implement procedures AD-AA-101 and AD-AA-102 when processing revision 7 to the EFCV testing procedures, HC.IC-FT.BB-0066(Q) and HC.IC-FT.BB-0067(Q).

This allowed inadequate procedures to be implemented in the field and resulted in the RRP seal failure.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” requires that “activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.”

Contrary to the above, on May 8, 2021, procedures HC.IC-FT.BB-0066(Q) and HC.IC-FT.BB-0067(Q) were inadequately revised and included changes that were not properly reviewed as specified in PSEG procedures AD-AA-101 and AD-AA-102. This resulted in the implementation of inadequate procedures that were not appropriate to the circumstances and did not ensure that important activities were satisfactorily accomplished. Specifically, the implementation of the inadequate procedures directly impacted the integrity of RRP seals.

Enforcement Action: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

Inadequate Corrective Actions for Limit Switch Environmental Qualified Life (S)

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000272, 05000311/2021012-03 Open/Closed	[P.2] – Evaluation	71152B

The inspectors identified a Green finding and associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” when PSEG (Salem) did not ensure that a condition adverse to quality (CAQ) associated with a deviation from analyzed temperature for a main steam isolation valve (MSIV) limit switch (L/S) was promptly identified and corrected. Specifically, temperature monitoring data for the 12MS167 MSIV L/S logged between January and August 2021, indicated that this L/S exceeded the assumed average temperature in the environmental qualification (EQ) life calculation. PSEG did not identify and promptly correct this CAQ nor re-evaluate the EQ life for this MSIV L/S which was subsequently determined to have exceeded its EQ life.

Description: 10 CFR 50.49, “Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants,” established testing and maintenance requirements to ensure certain equipment was qualified for its application and would meet its specified performance requirements when subjected to design basis event conditions predicted to be present when it must perform its safety function up to the end of its qualified life. Salem EQ Program procedures, including component EQ Binders, established installation and maintenance requirements to ensure equipment covered by 10 CFR 50.49 remains qualified. CC-AA-203, EQ Program, Revision 9, requires station personnel to schedule and perform preventive maintenance activities required by the EQ Program to maintain component environmental qualification.

In February 2021, the inspectors documented a delay in collecting and evaluating MSIV L/S temperatures in NRC IR 2021001, after the inspectors previously identified in August 2019, that elevated temperatures in the vicinity of the 12MS167 L/S exceeded the normal service temperature (160°F) used to determine the L/S EQ life. At the time, the inspectors concluded

the significance of the delay in collecting and evaluating the temperature data was minor based on analysis of the temperature data at the time, all the installed L/Ss remained qualified until September 2023.

On October 1, 2019, as a follow-up action to the above observations, PSEG created both an initial and long-term monitoring plan (70209183-0030) for the MSIV L/S temperatures. In discussions with PSEG, the inspectors found that the initial monitoring, which involved operators logging temperatures three times a day and reviewing the data weekly, was unreliable due to the collection method. PSEG's long-term monitoring started in January 2021, and involved hooking up thermocouples to each MSIV L/S and periodically downloading and reviewing the data on a monthly basis.

On September 4, 2021, the inspectors completed a follow-up review of PSEG's temperature data collected between January and August 2021, and determined that PSEG's data review did not identify that at least one MSIV L/S, the 12MS167L3T, may be beyond its evaluated EQ qualified life based on the average temperature recorded at the L/S location. Based on the inspector's review of the Winter, Spring and Summer months, the temperature of the 12MS167L3T appeared to never drop below 163°F and the average temperature for all 8 months of data was always well above 163°F (closer to 180°F). Using PSEG's previous calculation for MSIV L/S EQ life, the inspectors determined this L/S likely exceeded its EQ life on January 1, 2021. PSEG documented this in NOTF 20883487* and performed a technical evaluation (TE) 70219402, which was completed on September 10, 2021. The inspectors reviewed this TE and noted that it revised Salem's vendor approved and tested activation energy (eV) without ensuring that valid test data existed on identical materials to adequately justify and technically support the significant change to the evaluated eV. PSEG documented this in NOTF 20884260*. On September 22, 2021, PSEG completed a new TE under 70219402 which reviewed the temperature data collected to date and determined if the eV remains the same then the L/S will likely exceed its EQ life. The TE also determined that the L/S maintains its functional capability. PSEG created NOTF 20884260* to track corrective actions to replace the switch at the earliest opportunity, as well as perform an extent of condition on the other L/S.

Based on the information above, PSEG did not ensure that a CAQ associated with a deviation from analyzed temperature for L/S was promptly identified and corrected. Specifically, temperature monitoring data for the 12MS167 L/S logged between January and August 2021 indicated that this L/S exceeded the assumed average temperature in the EQ life calculation. PSEG did not identify and correct this CAQ nor re-evaluate the EQ life for this MSIV L/S which was subsequently determined to have exceeded its EQ life. The inspectors also determined that PSEG revised the MSIV L/S EQ calculation eV assumptions without properly justifying the changes using appropriate and approved analyses (e.g., similar material, degradation mechanism, temperature, and chemical reaction).

Corrective Actions: PSEG's corrective actions included documenting the above concerns in their corrective action program, performing multiple technical evaluations for the analyzed temperatures, re-evaluating the qualified life of the MSIV L/Ss, and scheduling the replacement of the affected switches during the next refueling outage.

Corrective Action References: 20868904, 20883487*, 20884260*, 70219402

Performance Assessment:

Performance Deficiency: PSEG did not ensure a CAQ associated with a deviation from analyzed temperature for a MSIV L/S was promptly identified and corrected was a performance deficiency. Specifically, temperature monitoring data for the 12MS167 L/S L3T logged between January and August 2021 indicated that this L/S exceeded the assumed average temperature in the EQ life calculation. PSEG did not identify a CAQ when an MSIV L/S exceeded its EQ life. This was a performance deficiency that should have been foreseen and prevented.

Screening: The inspectors screened this performance deficiency in accordance with IMC 0612, Appendix B, "Issue Screening Directions," and determined it to be more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, regardless of the final operability or functionality of the MSIV L/S, the as-found condition was such that there was reasonable doubt with respect to the assurance of availability and reliability.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Exhibit 1, "Initiating Events Screening Questions," of IMC 0609, Appendix A, the inspectors determined this finding was of very low safety significance (Green) because "Yes" was not answered to any of the screening questions.

Cross-Cutting Aspect: P.2 – Evaluation. The organization thoroughly evaluates issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance. The inspectors determined that the finding had a cross-cutting aspect of Evaluation within the cross-cutting area of Problem Identification and Resolution because PSEG did not thoroughly evaluate the MSIV L/S temperature data, or the changes made to vendor approved and tested eV in their TE.

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to ensure that CAQs, such as deviations and nonconformances are promptly identified and corrected.

Contrary to the above, between January and September 3, 2021, PSEG did not periodically review and evaluate the collected temperature data from the MSIVs to ensure that any potential CAQ associated with a deviation from analyzed temperature for a MSIV L/S EQ life was promptly identified and corrected. Specifically, temperature monitoring data for the 12MS167 L/S logged between January and August 2021, indicated that this L/S exceeded the assumed average temperature in the EQ life calculation. PSEG did not identify and promptly correct this CAQ nor re-evaluate the EQ life for this MSIV L/S which subsequently was determined to have exceeded its EQ life.

Enforcement Action: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

Observation: Problem Identification Observations and Minor Performance Deficiencies

71152B

The inspectors identified several observations related to problem identification at Hope Creek and Salem. Specifically, the inspectors noted that:

- (H) PSEG did not document four CAQs associated with common cause evaluation (CCE) 70218389 for the emergency diesel generator recirculation fan temperature switch setpoints, contrary to LS-AA-120, Issue Identification, Step 4.2. PSEG documented the CAQs in NOTFs 20883572*, 20883573*, 20883574*, and 20883575*.
- (S) PSEG did not identify that they had not adequately justified changing the frequency of preventive maintenance for the chiller service water supply valves because the justification was based on an incomplete design change, contrary to ER-AA-210-1005, Design Change Process. PSEG documented this issue in NOTF 20883931*.
- (C) PSEG did not document three issues associated with unsatisfactory equipment performance during fire protection functional testing, contrary to LS-AA-120, Step 4.2. PSEG documented the CAQs in NOTFs 20883659*, 20883660*, and 20883532*.
- (C) The inspectors determined that PSEG did not identify that security system functional testing was not being performed in accordance with SY-AA-101-140, Security Equipment Testing, Step 4.2.3. PSEG documented this issue in NOTF 20879646*.
- (C) PSEG was untimely in documenting seven issues involving measuring and testing equipment (M&TE) found to be out-of-tolerance. PSEG documented the issue in NOTF 20883865*.
- (C) PSEG did not document all NRC documented findings and observations in NOTFs, contrary to LS-AA-1003, NRC Inspection Preparation and Response, Step 3.7.4. PSEG documented these misses in NOTFs 20883967*, 20883970* through 20883973*, and 20883984*.

The inspectors evaluated all the issues above in accordance with the guidance in IMC 0612, Appendix B, "Issue Screening," and Appendix E, "Examples of Minor Issues," and determined the issues were of minor significance and not subject to enforcement action in accordance with the NRC's enforcement policy.

Observation: Problem Prioritization and Evaluation Observations and Minor Performance Deficiencies	71152B
<p>The inspectors identified several observations related to problem evaluation at Hope Creek and Salem. Specifically, the inspectors noted that:</p> <ul style="list-style-type: none"> • (H) PSEG's problem statement in root cause evaluation 70217929 for the RRP seal failures did not include specific information about the method of discovery, contrary to LS-AA-125-1001, Causal Evaluations, Step 4.1.6. PSEG documented this in Order 80128711-1020* to evaluate the operator's ability to identify off-normal RRP seal parameters during all evolutions. • (H) PSEG did not document an issue exceeding the shelf life in accordance with SM-AA-300-1005, PSEG Nuclear LLC In-Storage Shelf Life Program, Attachment 1, Table 5, for a failed reactor feed pump low pressure suction switch in equipment reliability evaluation 70218387. For the same evaluation, the inspectors also determined that PSEG did not properly evaluate the switch failure as a maintenance preventable functional failure in accordance with ER-AA-310-1004, Maintenance Rule – 	

Performance Monitoring, Attachment 4. PSEG documented these issues in NOTF 20884959*.

- (S) PSEG did not technically justify TE 70218843-0120 for the turbine driven auxiliary feedwater pump room cooler, which further supported a 50.59 evaluation conclusion and operations procedure change, contrary to CC-AA-11, Step 4.2.3. PSEG documented these issues in NOTFs 20882377* and 20883880*.
- (C) PSEG did not complete the failure mode causal table associated with the 'H' safety relief valve root cause evaluation 70206428, contrary to MA-AA-716-004, Complex Troubleshooting, Attachment 2. The inspectors also determined that PSEG did not properly code actions to perform multiple gap analyses of industry safety relief valve (SRV) technical reports as operating experience reviews (OE3) which are required to be completed within 90 days per LS-AA-115, Operating Experience, Attachment 1. In addition, PSEG missed multiple opportunities to create a preventive maintenance activity for the annual review of the conduct of plant engineering matrix in ER-AA-2030, Conduct of Plant Engineering, Attachment 1. The inspectors determined that all three of these issues delayed PSEG's corrective actions to previous SRV failures. PSEG documented these issues in 20883726*, 20878847*, and 20883480*.
- (C) PSEG did not consistently apply the procedural requirements for both the documentation of causal evaluation problem statements and extent-of-conditions per LS-AA-125-1001, Causal Evaluations, and timely review and approval of causal evaluations by the management review committee per LS-AA-125, Corrective Action Program. The inspectors noted that these issues could impact or delay the implementation of adequate corrective actions. PSEG documented the issues in NOTFs 20884424* and 20883441*.

The inspectors evaluated all the issues above in accordance with the guidance in IMC 0612, Appendix B, "Issue Screening," and Appendix E, "Examples of Minor Issues," and determined the issues were of minor significance and not subject to enforcement action in accordance with the NRC's enforcement policy.

Observation: Corrective Action Observations and Minor Performance Deficiencies	71152B
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The inspectors identified several observations related to the timeliness of corrective actions at Hope Creek and Salem. Specifically, the inspectors noted that:

- (H) PSEG did not complete timely corrective actions for the station service water pump seismic support plate degradation that was identified in a causal evaluation (70213125) extent-of-condition, contrary to LS-AA-125-1001, Causal Evaluations, Step 4.2.8. PSEG documented this issue in NOTF 20884592*.
- (H) PSEG did not complete two corrective actions associated with a causal evaluation (70213330) for meteorological tower updated final safety analysis report and technical requirements manual non-compliances. PSEG documented this issue in NOTF 20883483*.
- (S) PSEG did not appropriately account for the reliability of the auxiliary feedwater pump discharge check valves when they scheduled the associated preventive maintenance activity beyond the approved nine-year frequency (70211792), contrary to ER-AA-210, Preventive Maintenance. PSEG documented this issue in NOTF 20883477*.
- (C) PSEG did not consistently complete and approve PCRs and performance analyses in a timely manner in accordance with ER-AA-210, Preventive Maintenance,

and LS-AA-125, Corrective Action Program. The inspectors determined that 75 Salem and 76 Hope Creek PCRs were completed greater than the 90 day requirement. The inspectors also determined that 74 Salem and 30 Hope Creek performance analyses were completed greater than the 28 day requirement. PSEG documented these issues in NOTFs 20882810* and 20883103*.

The inspectors evaluated all the issues above in accordance with the guidance in IMC 0612, Appendix B, "Issue Screening," and Appendix E, "Examples of Minor Issues," and determined the issues were of minor significance and not subject to enforcement action in accordance with the NRC's enforcement policy.

Observation: Operating Experience Observations and Minor Performance Deficiencies	71152B
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The inspectors identified an observation related to the use of operating experience at Hope Creek and Salem. Specifically, the inspectors noted that PSEG did not perform timely operating experience reviews (OE3) in accordance with LS-AA-115, Operating Experience, Attachment 1. Specifically, 48 out of 146 OE3 reviews were completed greater than the 90 day requirement. PSEG documented this issue in NOTF 20883921*. The inspectors evaluated the issue above in accordance with the guidance in IMC 0612, Appendix B, "Issue Screening," and Appendix E, "Examples of Minor Issues," and determined the issue was of minor significance and not subject to enforcement action in accordance with the NRC's enforcement policy.

Observation: Self-Assessments and Audits Observations and Minor Performance Deficiencies	71152B
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The inspectors identified an observation related to self-assessments and audits at Hope Creek and Salem. Specifically, the inspectors noted that PSEG Nuclear Oversight audits were routinely identifying the same deficiencies in different audits separated in time and focus area, which indicated the potential for missed opportunities to identify areas for PSEG to follow-up and fix. Examples include Nuclear Oversight identifying repeated concerns with the PSEG not documenting deficiencies associated with M&TE in NOTFs, surveillance tests not being retained in PSEG's document collecting and retention management system, and deficiencies associated with stand-alone documentation (reference NOS reports: NOSA-SLM-19-09, NOSA-HPC-19-09, and NOSA-HPC-20-06). PSEG documented this issue in NOTF 20884958*. The inspectors evaluated the issue above in accordance with the guidance in IMC 0612, Appendix B, "Issue Screening," and Appendix E, "Examples of Minor Issues," and determined the issue was of minor significance and not subject to enforcement action in accordance with the NRC's enforcement policy.

Observation: Security Related Observations and Documentation	71152B
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During review of PSEG security-related items for the inspection, the inspectors documented one finding of very low security significance (Green) involving a violation of NRC requirements. The following cross-cutting aspect was assigned to the finding using IMC 0310 "Aspects Within Cross Cutting Areas:" [P.3] – Resolution. The inspectors also documented a licensee-identified violation which was determined to be of very low security significance. The NRC is treating these violations as NCVs consistent with Section 2.3.2 of the Enforcement Policy. PSEG documented these issues in NOTFs 20883577* and 20884233*, respectively. The results of the inspector's review related to security are documented in NRC Inspection Reports 2021403 for both Salem and Hope Creek but because the report contains Security-

Related Information, it will not be made publicly available in accordance with 10 CFR 2.390(d)(1).

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On September 17, 2021, the inspectors presented the biennial problem identification and resolution inspection results to Mr. Charles Mcfeaters, Senior Vice President of Nuclear Operations, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152B	Corrective Action Documents	NOTF No.	20852879 20883405 20883532 20883472 20883659 20883660 20883483 20883732 20883579 20883663 20883690 20883510 20883513 20883572 20883573 20883574 20883575 20883865 20884086 20883974 20884236	
71152B	Corrective Action Documents	Order Nos.	60148915	
71152B	Miscellaneous	LER 2019-001-00 70205211-240 OE311381 70205211-250 OE319747 70205211-300 OE470831		
71152B	Self-Assessments	NOSA-HPC-20-09 Surveillance		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		and Test Program (ISI/IST) 11/23/2020 IST FASA 70207612 5/20/20 NOSA-HPC-20-06 Engineering Programs 8/20/2020 2020 PRE-NRC 71111.11 INSPECTION FASA 7/21/20 NOSA-HPC-19-09 Operations, Operations Training, and FRC 11/25/2019 NOSA-HPC-20-07 Fire Protection 10/30/2020		