



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
2100 RENAISSANCE BLVD., SUITE 100  
KING OF PRUSSIA, PA 19406-2713

September 15, 2015

Mr. Robert C. Braun  
President and Chief Nuclear Officer  
PSEG Nuclear LLC – N09  
P.O. Box 236  
Hancocks Bridge, NJ 08038

**SUBJECT: SALEM NUCLEAR GENERATING STATION UNIT 1 – SUPPLEMENTAL  
INSPECTION REPORT 05000272/2015009 AND ASSESSMENT FOLLOW-UP  
LETTER**

Dear Mr. Braun:

On August 7, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection pursuant to Inspection Procedure (IP) 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area," at your Salem Nuclear Generating Station (Salem) Unit 1. The enclosed inspection report documents the inspection results, which were discussed on August 11, 2015, with Mr. John Perry, Site Vice President, and other members of your staff.

In the fourth quarter of 2014, your staff reported an October 19, 2014, unplanned manual reactor trip at Salem Unit 1 that caused the NRC "Unplanned Manual Scrams per 7,000 Hours Critical" performance indicator (PI) to cross a threshold from Green to White. Based on your report, the NRC assigned a White PI Action Matrix input to the Initiating Events cornerstone in the fourth quarter of 2014.

In response to this Action Matrix input, the NRC informed you in the Annual Assessment Letter, dated March 4, 2015, that a supplemental inspection under Inspection Procedure 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area," would be required. On May 29, 2015, you informed the NRC that Salem Unit 1 was ready for the supplemental inspection.

The NRC performed this supplemental inspection to determine if (1) the root and contributing causes for the significant issues were understood; (2) the extent of condition and extent of cause for the identified issues were understood; and (3) your completed or planned corrective actions were sufficient to address and prevent repetition of the root and contributing causes. The inspection consisted of examination of activities conducted under your license as they related to safety, compliance with the commission's rules and regulations, and the conditions of your operating license.

Based on the results of this inspection, the NRC concluded that PSEG Nuclear LLC (PSEG) performed a comprehensive evaluation of the White PI and the inspection objectives were met. PSEG's evaluation of the root and contributing causes associated with four unplanned reactor scrams was generally appropriate. PSEG appropriately identified the root cause to include

ineffective use and enforcement of existing processes to prevent operational challenges which could lead to reactor scrams. Notwithstanding, inspectors identified a general weakness in PSEG's development of root and contributing causes for the Unplanned Scrams White PI. Specifically, the inspectors identified that each of the four plant trips had past ineffective or incomplete corrective actions to prevent recurrence (CAPRs) for previous events, but this was not considered as a potential causal factor in any of PSEG's root causes. Consequently, PSEG did not explore any extent of condition, extent of cause, or corrective actions for this potential corrective action program (CAP) weakness. In response to the inspectors' concerns, PSEG revised the root cause report to address the general weakness. The inspectors determined this was not a significant weakness because PSEG had previously established corrective actions for an unrelated issue that would address past missed or ineffective CAPRs and additional corrective actions to address any potential CAP implementation weaknesses.

Overall, PSEG adequately identified the individual and collective performance issues associated with the White PI and have generally appropriate corrective actions either implemented or planned to address these issues. The NRC has determined that completed or planned corrective actions were sufficient to address the performance that led to the White PI.

No NRC-identified or self-revealing findings were identified during this inspection. However, inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the NCV, 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, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspectors at Salem.

Based on the guidance in Inspection Manual Chapter 0305, "Operating Reactor Assessment Program," and the results of this inspection, the White PI will be closed and Salem Unit 1 will transition from the Regulatory Response Column of the NRC's Action Matrix to the Licensee Response Column as of the date of the cover letter to this report.

R. Braun

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In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Glenn T. Dentel, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

Docket No. 50-272  
License No. DPR-70

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Inspection Report 05000272/2015009  
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U.S. NUCLEAR REGULATORY COMMISSION (NRC)

REGION I

Docket No. 50-272

License No. DPR-70

Report No. 05000272/2015009

Licensee: PSEG Nuclear LLC (PSEG)

Facility: Salem Nuclear Generating Station, Unit 1

Location: P.O. Box 236  
Hancocks Bridge, NJ 08038

Dates: July 20, 2015 through August 7, 2015

Inspectors: J. Ambrosini, Senior Resident Inspector, Lead Inspector  
B. Smith, Resident Inspector

Approved by: Glenn T. Dentel, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

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## SUMMARY OF FINDINGS

IR 05000272/2015009; 07/20/2015 – 08/07/2015; Salem Nuclear Generating Station, Unit 1; Supplemental Inspection – Inspection Procedure (IP) 95001.

A Region I senior resident inspector and a resident inspector performed this inspection. The NRC reviewed one violation of very low safety significance that was identified by PSEG. The significance of most findings is indicated by their color (i.e., green, white, yellow, or red) using the NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

### **Cornerstone: Initiating Events**

The NRC staff performed this supplemental inspection in accordance with IP 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," to assess PSEG's root cause evaluation (RCE) and corrective actions taken in response to four unplanned scrams of Unit 1 during 2014. Overall, the inspectors determined PSEG adequately evaluated and addressed the performance issues that resulted in the multiple reactor scrams at Unit 1 and concluded that PSEG successfully met the inspection objectives for IP 95001. PSEG evaluated the collective station performance in a RCE titled "Unplanned Scrams per 7000 Critical Hours - Unit 1 White" (SAP Order Number 70171797) and determined that there were two root causes. PSEG identified the first root cause as "behaviors of site leadership did not effectively enforce existing processes to ensure specific and adequate actions were developed, challenged, and implemented to prevent operational challenges leading to reactor scrams" and the second root cause as "ineffective knowledge and use of existing processes to develop plans and actions that could have mitigated the risk of the reduced scram margin." The inspectors evaluated these root causes and found they accurately captured the reasons behind the multiple reactor scrams at Unit 1.

The inspectors reviewed this RCE and three others PSEG performed in response to the individual unplanned scrams: 70165169, "Unit 1 Ground 11 Steam Generator Feed Pump (SGFP) Reactor Trip"; 70165317, "U1 Generator Protection RCE 95001"; and 70172037, "1R23 Manual Reactor Shutdown Unplanned Reactor Scram." The inspectors determined that the RCEs were generally thorough and the associated proposed corrective actions adequately address the underlying causal factors. Additionally, the inspectors concluded that the combined effect of the completed and planned corrective actions taken in regards to the four unplanned scrams were reasonable to address the related performance issues. Notwithstanding, the inspectors identified a weakness in PSEG's development of root and contributing causes for the Unplanned Scrams White performance indicator (PI). Specifically, the inspectors identified that each of the four plant trips had problems with ineffective or incomplete corrective actions to prevent recurrence (CAPRs) for past events, but this was not considered as a potential causal factor in any of PSEG's root causes. Consequently, PSEG did not explore any extent of condition, extent of cause, or corrective actions for this potential corrective action program (CAP) weakness. The inspectors determined this was not a significant weakness because PSEG had previously established corrective actions for an unrelated issue that would address past missed or ineffective CAPRs and additional corrective actions to address any potential CAP implementation weaknesses. The inspectors evaluated this weakness against guidance contained in IP 95001 and determined that it did not represent a substantial inadequacy in PSEG evaluation of the causes of the performance issue, determination of the extent of the

performance issue, or actions taken or planned. As a result, the inspectors determined that PSEG successfully met the inspection objectives of IP 95001. In response to the inspector's concerns, PSEG revised the root cause report to address the general weakness.

A violations of very low safety significance that was identified by PSEG has been reviewed by the NRC. Corrective actions taken or planned have been entered into PSEG's corrective action program. This violation and corrective action tracking number is listed in Section 4OA7 of this report."

Based on the guidance in IMC 0305, "Operating Reactor Assessment Program," and the results of this inspection, the White PI associated with the 2014 unplanned scrams is closed and Salem Unit 1 will transfer to the Licensee Response Column of the matrix as of the date of the cover letter to this report.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA4 Supplemental Inspection (IP 95001)

##### .01 Inspection Scope

The NRC staff performed this supplemental inspection in accordance with IP 95001 to assess PSEG's evaluation of a White PI, which affected the Initiating Events cornerstone in the Reactor Safety strategic performance area. The inspection objectives were:

- To provide assurance that the root causes and contributing causes of risk-significant performance issues are understood;
- To provide assurance that the extent of conditions and extent of cause of risk-significant performance issues are identified; and
- To provide assurance that PSEG's corrective actions for risk-significant performance issues are sufficient to address the root and contributing causes and prevent recurrence.

Salem Unit 1 experienced four unplanned plant trips from April 8, 2014, to October 19, 2014, which caused Unit 1 to exceed the performance threshold for unplanned scrams per 7000 critical hours. There were four unplanned plant trips of Salem Unit 1 in 2014:

- On April 8, 2014, operators noted a trip of the 11 SGFP and manually tripped the reactor due to low level in the 13 steam generator. PSEG determined that there was a ground on a test limit switch cable that caused 12 miscellaneous alternate current breaker 8 to open. When breaker 8 opened, there was no power to the power supplies for the 11 SGFP speed probes which caused the SGFP Woodward governor to shut down. With the exception of the cable ground, all equipment performed as expected and operator actions were in accordance with plant procedures.
- On April 13, 2014, Salem Unit 1 automatically tripped on a main turbine trip which was caused by a main generator phase 'C' differential current lockout relay trip. PSEG identified the cause of the trip as an open circuit on the phase 'C', overall differential neutral bushing current transformer (CT).
- On May 7, 2014, Salem Unit 1 automatically tripped on generator protection initiated by a main generator phase 'A' differential relay trip. PSEG identified the cause of the trip as a failed lead in the neutral 'A' phase generator differential CT termination box. Due to the short timeframe between the two CT unplanned plant trips, PSEG completed a single RCE that addressed both events in order to identify CAPRs of the common CT failures.
- On October 19, 2014, operators manually tripped Unit 1 to begin a planned refueling outage (RFO). Prior to the start of the RFO, Salem Unit 1 experienced oil leaks in the 'B' main power transformer and developed an adverse condition monitoring plan to monitor equipment status for continued degradation. Operators tripped

the reactor in response to degraded conditions of the main power transformer but not in accordance with pre-planned RFO shutdown procedures, which made this plant trip count against the unplanned scram PI.

The inspectors reviewed the RCEs for each of the unplanned trips to assess the adequacy of the corrective actions taken in response to the events.

PSEG staff informed the NRC on May 29, 2015, that they were ready for the IP 95001 supplemental inspection.

The inspectors reviewed PSEG's RCEs, reviewed applicable CAP documents, and interviewed licensing, engineering, maintenance, and operations management personnel to ensure that the root and contributing causes were understood and corrective actions taken or in progress were appropriate to address the identified causes and to prevent recurrence of the issues.

## .02 Evaluation of the Inspection Requirements

### 02.01 Problem Identification

- a. *IP 95001 requires that the inspection staff determine that PSEG's evaluation of the issue documents who identified the issue (i.e., licensee-identified, self-revealing, or NRC-identified) and the conditions under which the issue was identified.*

The inspectors determined that PSEG's RCEs adequately described the conditions through which these were identified. PSEG described the first three unplanned scrams as self-revealing and appropriately gave credit to the NRC for identification of the fourth. For the fourth unplanned scram, the unplanned manual scram during the shutdown for RFO 1R23, PSEG accurately described the challenge made by the senior resident inspector against the initial classification of this event as "planned". The senior resident inspector observed the operating crew conducting the shutdown and questioned the operator's use of operating procedures and reportability of the reactor scram. PSEG documented these concerns in Notification 20665979 and determined the scram to enter RFO 1R23 was unplanned after further review.

The NRC documented PSEG's failure to make a timely notification at the start of RFO 1R23 for a valid actuation of the reactor protection system when the reactor was critical as a Severity Level IV non-cited violation (NCV) in Inspection Report 05000272/2014005 (NCV 05000272/2014005-05, Failure to Report a Manual Reactor Trip).

Overall, the inspectors determined that PSEG's RCEs effectively document who identified the issue and the conditions under which the issue was identified.

- b. *IP 95001 requires that the inspection staff determine that PSEG's evaluation of the issue documents how long the issue existed and prior opportunities for identification.*

The inspectors determined that PSEG's RCEs adequately documented how long the issues leading to each of the four unplanned scrams existed and that prior opportunities for identification were identified. Additionally, PSEG reviewed administrative barriers that failed to identify that reduced margin existed for the White PI for unplanned scrams.

#### April 8, 2014 11 SGFP Trip

PSEG determined that the April 8, 2014, manual reactor trip was the result of an accumulation of missed opportunities by PSEG to use the corrective action system effectively. The CAP investigations and the corrective actions did not correct a known deficiency in the SGFP Woodward governor circuit design that increased the likelihood of a poorly announced SGFP shutdown and a plant response that requires operators to initiate a reactor trip. This vulnerability was tolerated from 1999 until the event.

#### April 13, 2014 and May 7, 2014 Generator CT trips

PSEG determined that the April 13, 2014, trip could not have reasonably been prevented because although a previous CT failure caused a trip at Salem Unit 1 in 2001, CAPRs for the 2001 trip were presumed to be complete when they were not. PSEG discovered that a 2004 design change intended to mitigate the conditions that led to the plant trip was not properly implemented despite the design change paperwork documentation stating otherwise.

PSEG did determine that there were prior opportunities to identify the conditions that led to the May 7, 2014, plant trip, as the extent of condition inspection and repairs to the CT connections were made based on visual examination and testing but the station did not recognize the risk regarding the ability of the visual examination and testing to identify potential common mode failures. The extent of condition examination and testing was not sufficient to identify similar conditions which led to the repeat trip on May 7, 2014.

#### October 19, 2014 Unplanned Scram to Begin RFO 1R23

PSEG determined that there were known weaknesses in procedure use and adherence (PU&A) at Salem Unit 1 as documented in common cause evaluation (CCE) 70156124. This CCE was developed in response to PU&A weaknesses in engineering and supplemental employee performance identified through NRC cross-cutting aspects. While PSEG implemented corrective actions from this CCE within engineering and maintenance, no actions were assigned to the operations department. This was a potential missed opportunity to identify similar behaviors in operations, which could have prevented the unplanned scram.

In addition, PSEG evaluated several organizational barriers that failed to identify the reduced margin to the White threshold for the Unplanned Scrams PI. PSEG determined that there was a failure of station leadership to enforce requirements of administrative procedures in the following programs:

- Maintenance Rule: ER-AA-301, "Implementation of the Maintenance Rule," requires a review for compliance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.65(a)(1) whenever plant level performance criteria is exceeded. This did not happen following the April 13, 2014, trip when the plant level performance criteria of greater than one event per quarter was exceeded. As a result, PSEG did not develop a maintenance rule (a)(1) plan, which would have provided an opportunity to perform a comprehensive review of plant performance.
- Unplanned Scram PI Management: LS-AA-2001, "NRC PI Data and Collection," requires a monthly review of all NRC PI, but PSEG did not perform the required actions to develop a plan in response to the reduced margin following the third plant

- trip. Additionally, senior station leadership did not question these results during the quarterly challenge meeting.
- Regulatory Analysis: LS-AA-1040, "Regulatory Analysis," could have been used as a tool to develop a strategy and risk mitigation plan when the PSEG noted the reduced margin for the Unplanned Scram PI, but was not implemented for unknown reasons.
  - Performance Improvement Integrated Matrix (PIIM)/Excellence Plan: LS-AA-125-1006, "Performance Improvement Integrated Matrix (PIIM) (Excellence Plan)," did result in PSEG developing a scram margin reduction plan. However, this plan remained in draft status and was not included in the final PIIM reviewed by management.
  - Management Review Meetings: Due to scheduling, management review meetings occurred in the first and last quarters of 2014, prior to and after the unplanned scrams.

The inspectors evaluated each of these failed barriers for potential performance deficiencies subject to further enforcement action and determined that there was one licensee-identified violation of 10 CFR 50.65 for the failure to assess performance and develop goals when the (a)(1) threshold was exceeded. This is described further in section 4OA7. The inspectors determined the other administrative procedure issues were either not more than minor (Unplanned Scram PI Management and Regulatory Analysis) or not performance deficiencies (PIIM and management review meetings) as they did not meet the definitions as listed in IMC 0612, "Power Reactor Inspection Reports."

Overall, the inspectors determined that PSEG's RCE effectively documents that the operator performance issue had existed for several years and documented prior opportunities for identification.

- c. *IP 95001 requires that the inspection staff determine that PSEG's evaluation documents the plant specific risk consequences, as applicable, and compliance concerns associated with the issue(s).*

PSEG documented the risk associated with the unplanned scrams in a qualitative manner, as allowed by LS-AA-125-1001, "Root Cause Evaluation Manual." In RCE 70171797, Salem Unit 1 Unplanned Scram White PI, PSEG documented the qualitative risk consequences for industrial safety, nuclear safety, chemical and radiological safety, and the regulatory impact of the events. PSEG determined there was no significant challenges to safety systems as a result of any of the unplanned scrams.

Overall, the inspectors determined that PSEG's evaluation documented the plant specific risk consequences and compliance concerns associated with the issue.

- d. Findings

No findings were identified

## 02.02 Root Cause, Extent of Condition, and Extent of Cause Evaluation

- a. *IP 95001 requires that the inspection staff determine that PSEG evaluated the issue using a systematic methodology to identify the root and contributing causes*

PSEG used varied approaches to identify the root and contributing causes of each of the unplanned scrams as well as the overall reasons for the PI change from Green to White, including MORT [Management, Oversight, and Risk Tree], event and causal factors, failure modes and effects analysis, Pareto analysis, and TapRoot.

PSEG determined there were two root causes and one contributing cause that led to the Unplanned Scram PI to cross the White threshold. PSEG identified the first root cause as “behaviors of site leadership did not effectively enforce existing processes to ensure specific and adequate actions were developed, challenged, and implemented to prevent operational challenges leading to reactor scrams” and the second root cause as “ineffective knowledge and use of existing processes to develop plans and actions that could have mitigated the risk of the reduced scram margin.” For contributing cause, PSEG determined that “governance and oversight was ineffective in identifying weaknesses in the application of fundamentals to prevent reactor scrams.”

- b. *IP 95001 requires that the inspection staff determine that PSEG’s RCE was conducted to a level of detail commensurate with the significance of the issue.*

Overall, the inspectors determined that PSEG conducted the RCE for the White PI for Unplanned Scrams with a level of detail commensurate with the significance of the issue. PSEG’s evaluation of the root and contributing causes associated with four unplanned reactor scrams was generally appropriate. PSEG appropriately identified the root cause to include ineffective use and enforcement of existing processes to prevent operational challenges which could lead to reactor scrams. The inspectors noted PSEG focused the analysis not just on equipment issues which resulted in the unplanned scrams, but also explored potential programmatic and human performance weaknesses which could have also contributed to the scrams. This thorough approach resulted in more comprehensive corrective actions than simply addressing the equipment reliability problems.

Notwithstanding, the inspectors identified a general weakness in the depth of analysis for the root cause determination. The inspectors determined that each of the four plant trips was ultimately caused by a previous ineffective CAPR (modifications not done for SGFP trip and CT trips; 2007 PU&A RCE had essentially same root cause as the Unplanned Manual Scram RCE). PSEG identified the previous ineffective CAPR in each individual RCE, but did not generate any corrective actions to focus on potential CAP programmatic deficiencies. Additionally, PSEG did not describe this common failure in the White PI RCE.

The inspectors determined this was a general weakness, not a significant one, due to actions PSEG took for unrelated reasons. In 2013, PSEG performed a check-in self-assessment (CISA) for trips from 2010 – 2012 to evaluate actions taken to correct and prevent recurrence for nine previous unplanned scrams. CISA recommended further evaluation to determine what potential organizational or procedural gaps exist that led to the deltas observed in the CISA and the types of observations on ineffective corrective actions and incomplete closure of CAPRs and other corrective actions. PSEG completed the assessment and determined that some CAPRs resulted in little to no consequential actions and there was a breakdown of oversight to ensure appropriate actions are generated to achieve results. To correct this, PSEG revised ER-AA-2001, “Plant Health Committee,” to include an annual review of all CAPRs and other corrective

actions associated with plant scrams and trips from the previous year to allow station leadership an opportunity to influence unresolved corrective actions and challenge those with little or no corrective action taken. This procedure change was made June 26, 2015.

The inspectors determined that implementing the change to the Plant Health Committee would provide a mechanism for PSEG to review and challenge incomplete actions for major plant events and would help address the gap in CAP compliance the inspectors identified in the root cause reviews.

Additionally, the CISA reviewed a turbine overspeed trip from 2012 which recommended all RCEs from 2006 to present be reviewed to ensure they included CAPR and effectiveness reviews. This was not done in 2012 and the CISA due date to reopen action and perform review was not complete by its July 17, 2015, due date. When complete, this action would provide PSEG with a mechanism to review other latent issues from potentially incomplete CAPRs.

Although the actions from the CISA were not complete in a timely manner (greater than two years since the start of the assessment), it is unlikely that the corrective actions would have prevented any of the 2014 Unit 1 plant trips. The ineffective CAPRs for each of the four trips all predate 2010, the beginning date of the CISA corrective action focus.

In response to the inspectors' concerns, PSEG revised the Unplanned Scrams root cause report to incorporate the CISA corrective actions and strengthen their connection to the most recent plant trips. Additionally, PSEG added a new corrective action to the root cause report to prioritize CAP administrative procedures in the new 'PSEG University' the station is developing to reinforce the importance of the CAP. PSEG documented the inspectors' concerns in Notifications 20697701 and 20697705. PSEG did not identify any additional gaps in their review and response to the inspectors' questions.

Although the inspectors identified this weakness in PSEG's root cause, the inspectors determined this was not a significant weakness. The corrective actions PSEG had previously established would address past missed or ineffective CAPRs and any potential CAP implementation weaknesses. The inspectors evaluated this weakness against guidance contained in IP 95001 and determined that it did not represent a substantial inadequacy in PSEG evaluation of the causes of the performance issue, determination of the extent of the performance issue, or actions taken or planned. As a result, the inspectors determined that PSEG successfully met this inspection objective of IP 95001.

- c. *IP 95001 requires that the inspection staff determine that PSEG's RCE included a consideration of prior occurrences of the issue and knowledge of Operating Experience.*

PSEG's RCE included an evaluation of internal and external operating experience. PSEG also reviewed similar occurrences of this event at both Salem units and appropriately identified events that had the same causal factors and considered this in the development of corrective actions.

Overall, the inspectors determined that PSEG's RCE included a consideration of prior occurrences of the issue and knowledge of operating experience.

- d. *IP 95001 requires that the inspection staff determine that PSEG's RCE addresses the extent of condition and extent of cause of the issue.*

Overall, the inspectors determined that PSEG appropriately evaluated the extent of condition and extent of cause of the White PI RCE. PSEG reviewed other PIs, both NRC and industry based, to ensure the challenges to margin that went uncorrected prior to the Unplanned Scram PI changed to White do not exist in other PIs. In addition, PSEG reviewed management behaviors throughout PSEG Nuclear, including Hope Creek and corporate management to ensure behaviors are consistently driving performance improvement in accordance with the expectations of station leadership.

- e. *IP 95001 requires that the inspection staff determine that PSEG's root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components as described in IMC 0305.*

PSEG considered several safety culture aspects to be applicable to this issue: Personal Accountability, Questioning Attitude, Safety Communication, Leadership Accountability, Decision Making, Respectful Work Environment, Continuous Learning, Problem Identification and Resolution, and Work Processes. The inspectors noted that this was all of the potential safety culture aspects with the exception of Environment for Raising Concerns and challenged PSEG on how they would focus in-depth attention when so many aspects were considered to be contributing factors. PSEG determined that the comprehensive effort resulting from the root cause corrective actions and other actions from the Site Integrated Excellence Plan would address any deficiencies in safety culture.

Overall, the inspectors determined the RCE included a proper consideration of whether the root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components.

- f. Findings

No findings were identified.

#### 02.03 Corrective Actions

- a. *IP 95001 requires that the inspection staff determine that (1) PSEG specified appropriate corrective actions for each root and/or contributing cause, or (2) an evaluation that states no actions are necessary is adequate.*

The RCE documents corrective actions for the RCE, causal factors, and other issues. The inspectors reviewed all of the corrective actions to ensure that they addressed the identified causes. The inspectors found the completed and proposed corrective actions to be reasonable with regard to addressing the performance deficiencies identified with this event.

Some examples of the corrective actions taken and planned as a result of PSEG's RCE include:

- Salem established a 'PSEG University' to educate the workforce on requirements contained in PSEG administrative procedures. 'PSEG University' is part of the new employee orientation process to ensure newly hired employees acquire a fundamental level of knowledge of the administrative procedures required to perform their role. In addition, current employees participate in an out of the box evaluation (OBE) for 'PSEG University' based on the results of an administrative procedure job task analysis. The purpose of the OBE is to confirm individuals have adequate knowledge of designated administrative procedures to perform their job function. If PSEG identifies knowledge gaps during the OBE, the individual participant will receive additional remedial training. PSEG will place trend results of the OBE in the CAP and present a weekly trend report to the Management Review Committee to look for common knowledge gaps for future action. (to begin implementation September 2015)
- Using Salem's Analysis Process Activities procedure, TQ-AA-210-1100, Salem conducted a training development systems analysis to determine the scope of PSEG administrative procedures requiring additional action to improve employees' knowledge. PSEG used the results of this systematic job and tasks analysis to determine the scope of administrative procedures to be included in the 'PSEG University'. (completed May 2015)
- Salem's Site Vice President and Plant Manager conduct 'Job Performance Meetings' with each of their directors and managers. The purpose of the meeting is to address the roles and responsibilities of each individual's job function. The meetings contain the following elements: a clear definition of the employee's role, a clear definition of job responsibilities, and clear expectations to meet each job responsibility using the phrase "See It, Own It, Solve It, and Do It". These meetings are also the forum to discuss actions taken to develop people involved in recent plant issues or events and to reinforce leadership behaviors and standards required to successfully execute roles and responsibilities. (began implementing in May 2015)

Overall, the inspectors determined that PSEG specified appropriate corrective actions for the root cause, causal factors, extent of condition, and extent of cause listed in the RCEs.

- b. IP 95001 requires that the inspection staff determine that PSEG prioritized corrective actions with consideration of risk significance and regulatory compliance.*

The inspectors reviewed the prioritization of the corrective actions and verified that the prioritization was based on consideration of risk significance and regulatory compliance. The inspectors determined PSEG's corrective actions to be wide reaching and encompass many areas in the station. Therefore, there remained many open corrective actions at the time of the inspection.

Overall the inspectors determined that PSEG had established an appropriate schedule for implementing and completing the majority of the corrective actions.

- c. *IP 95001 requires that the inspection staff determine that PSEG established a schedule for implementing and completing the corrective actions.*

PSEG's corrective actions and proposed corrective action plan provided dates for completion of actions as described in the RCE. The inspectors determined that PSEG is placing great importance on CAPR number 5 in the unplanned scram RCE, which was to "establish a 'PSEG University' to ground the workforce on requirements contained in PSEG administrative procedures." 'PSEG University' was still in development at the time of the inspection and is scheduled to begin in September 2015.

Overall, the inspectors determined that the schedule for implementing and completing the corrective actions was reasonable.

- d. *IP 95001 requires that the inspection staff determine that PSEG developed quantitative and/or qualitative measures of success for determining the effectiveness of the CAPRs.*

The inspectors determined that the RCEs each included an effectiveness review plan for the associated corrective actions that was adequate to prevent recurrence. At the time of the inspection, however, all effectiveness reviews were scheduled to be completed by September 2016. The inspectors questioned whether enough time would have elapsed for PSEG to determine if their actions were effective given the breadth and depth of many of their actions.

Overall, the inspectors determined that PSEG has successfully developed and implemented an effectiveness review plan for the corrective actions associated with the RCEs.

- e. *IP 95001 requires that the inspection staff determine that PSEG's planned or taken corrective actions adequately address a Notice of Violation (NOV) that was the basis for the supplemental inspection, if applicable.*

The White PI that was the subject of this inspection was not associated with an NOV. Therefore, this inspection aspect was not applicable, and as a result, was not reviewed.

- f. Findings

No findings were identified.

#### 02.04 Evaluation of IMC 0305 Criteria for Treatment of Old Design Issues

PSEG did not request credit for self-identification of an old design issue; therefore, the issues were not evaluated against the IMC 0305 criteria for treatment of an old design issue.

#### 40A6 Exit Meeting

On August 11, 2015, the inspectors presented the inspection results to Mr. John Perry, Site Vice President, and other members of his staff, who acknowledged the results. The inspectors asked PSEG whether any material examined during the inspection should be considered proprietary. No proprietary information was retained by the inspection team.

**4OA7 Licensee-Identified Violations**

The following violation of very low safety significance (Green) was identified by PSEG and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

10 CFR 50.65 (a)(2) states, in part, that monitoring as specified in 10 CFR 50.65 (a)(1) is not required where it has been demonstrated that the performance or condition of an structure, system, or component is being effectively controlled through the performance of appropriate preventive maintenance, such that the structure, system, or component remains capable of performing its intended function. Paragraph (a)(1) requires, in part, that licensee shall monitor the performance of SSC within the scope of the rule against licensee-established goals in a manner sufficient to provide reasonable assurance the SSC are capable of fulfilling their intended safety functions.

Contrary to the above, PSEG failed to recognize that the plant level performance goal of only one reactor trip per year had been exceeded in the spring of 2014. Following the failure, PSEG failed to consider performing an evaluation under 10 CFR 50.65(a)(1) for establishing goals and monitoring against the goals until February 2015. PSEG's nuclear oversight organization identified this deficiency and documented it in Notification 20678696. The inspectors evaluated this finding using IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, Exhibit 1, "Initiating Events Screening Questions," and screened it to Green as it did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

**ATTACHMENT: SUPPLEMENTAL INFORMATION**

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee Personnel

J. Perry, Site Vice President  
L. Wagner, Plant Manager  
K. Chambliss, Regulatory Assurance  
R. DeNight, Operations  
S. Goss, Engineering  
R. Moore, Engineering  
R. Quan, Maintenance  
R. Truhan, Nuclear Oversight  
J. Wearne, Regulatory Assurance

Other

E. Rosenfeld, State of New Jersey Department of Environmental Protection

**LIST OF DOCUMENTS REVIEWED**

Procedures

LS-AA-125, Corrective Action Program, Revision 19  
LS-AA-125-1001, Root Cause Evaluation Manual, Revision 9  
ER-AA-310, Implementation of the Maintenance Rule, Revision 13  
LS-AA-125-F3, MCR Change Request, Revision 1

Condition Reports (\*NRC-identified)

20677597	20697471	70017189
70112239	20617209	20697699*
20686864	20697492	20697701*
70112239	20697503	20697705*
70156124	20684032	
70154960	70175423	

Work Order

60026567

Miscellaneous

NOSA-SLM-13-04, 2013 Corrective Action Program Audit Report  
NOSA-SLM-15-04, 2015 Corrective Action Program Audit Report  
PSEG Nuclear Integrated Site Excellence Plan, Revision 4  
Salem KPI Performance Improvement Dashboard, June 2015  
Excellence in Procedure Use and Adherence Change Management Plan, February 18, 2014  
DCR 80036354, Replacement for Salem 1 Main Generator CT Field Wiring, February 23, 2014  
SC.DE-TS.ZZ-2039, PSEG Technical Standard Cable Termination Methods Salem Generating Station

**LIST OF ACRONYMS**

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
CAP	corrective action program
CAPR	corrective action to prevent recurrence
CCE	common cause evaluation
CISA	check in self- assessment
CT	current transformer
IMC	Inspection Manual Chapter
IP	Inspection Procedure
NCV	non-cited violation
NRC	Nuclear Regulatory Commission, U.S.
OBE	out of the box evaluation
PI	performance indicator
PIIM	Performance Improvement Integrated Matrix
PU&A	procedure use and adherence
RCE	root cause evaluation
RFO	refueling outage
SGFP	steam generator feed pump