



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

February 12, 2020

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

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2 – DESIGN BASIS
ASSURANCE INSPECTION (TEAMS) INSPECTION REPORT
05000272/2020011 AND 05000311/2020011

Dear Mr. Carr:

On January 30, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Salem Nuclear Generating Station, Units 1 and 2 and discussed the results of this inspection with Mr. Charles McFeaters and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings or violations of more than minor significance were identified during this inspection.

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 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Mel Gray, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos. 05000272 and 05000311
License Nos. DPR-70 and DPR-75

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2 – DESIGN BASIS ASSURANCE INSPECTION (TEAMS) INSPECTION REPORT
05000272/2020011 AND 05000311/2020011 DATED FEBRUARY 12, 2020

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

Docket Numbers: 05000272 and 05000311

License Numbers: DPR-70 and DPR-75

Report Numbers: 05000272/2020011 and 05000311/2020011

Enterprise Identifier: I-2020-011-0004

Licensee: PSEG Nuclear, LLC.

Facility: Salem Nuclear Generating Station, Units 1 and 2

Location: Hancocks Bridge, NJ

Inspection Dates: January 13, 2020 to January 30, 2020

Inspectors: C. Baron, Contractor
J. DeBoer, Reactor Inspector
A. Della Greca, Contractor
J. Kulp, Senior Reactor Inspector
A. Patel, Senior Reactor Inspector
J. Schoppy, Senior Reactor Inspector

Approved By: Mel Gray, Chief
Engineering Branch 1
Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a design basis assurance inspection (teams) at Salem Nuclear Generating Station, Units 1 and 2, 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.

List of Findings and Violations

No findings or violations of more than minor significance were identified.

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.

REACTOR SAFETY

71111.21M - Design Bases Assurance Inspection (Teams)

The inspectors evaluated the following components and listed applicable attributes, permanent modifications, and operating experience:

Design Review - Risk-Significant/Low Design Margin Components (IP Section 02.02) (4 Samples)

- (1) 1B Emergency Diesel Generator (Mechanical)
 - Material condition and installed configuration (e.g., visual inspection/walkdown)
 - Normal, abnormal, and emergency operating procedures
 - Consistency among design and licensing bases and other documents/procedures
 - System health report, maintenance effectiveness and records, and corrective action history
 - Design calculations
 - Surveillance testing and recent test results
 - Equipment protection from fire, flood, and water intrusion or spray
 - Heat removal cooling water and ventilation
 - Energy sources, fuel and air (e.g., engine start, operation, and control)

The team used Appendix B guidance for *Valves, Pumps, Instrumentation, and As-Built System*.

- (2) Unit 2 Motor Driven Auxiliary Feedwater Pump
 - Material condition and installed configuration (e.g., visual inspection/walkdown)
 - Normal, abnormal, and emergency operating procedures
 - Consistency among design and licensing bases and other documents and procedures
 - System health report, maintenance effectiveness and records, and corrective action history
 - Equipment/environmental controls and qualification
 - Operator actions
 - Design calculations

- Surveillance testing and recent test results
- Range, accuracy, and setpoint of installed instrumentation
- Equipment protection from fire, flood, and water intrusion or spray
- Heat removal ventilation

The team used Appendix B guidance for *Valves, Pumps, Instrumentation, and As-Built System*.

(3) 1B 4KV Switchgear

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents and procedures
- System health report, maintenance effectiveness and records, and corrective action history
- Switchgear bus, breaker, and cable sizing
- Control logic and control power adequacy
- Equipment vendor documentation
- Environmental controls and seismic qualification
- Operator actions
- Transformer tap settings and degraded grid/voltage drop calculation
- Load flow analysis
- Adequacy of electrical power supply for motor and controls
- Short circuit calculation
- Overload and short circuit protective relays setting
- Protection coordination, load in-rush and full load current
- Range, accuracy, and setpoint of installed instrumentation
- Technical Specification required surveillance testing and recent test results
- Component adequacy for minimum voltage

The team used Appendix B guidance for *Valves, Pumps, Instrumentation, and As-Built System*.

(4) 11CC16 Residual Heat Removal Heat Exchanger Component Cooling Water Isolation Motor Operated Valve

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents and procedures
- System health report, maintenance effectiveness and records, and corrective action history
- Control logic
- Equipment/environmental controls and qualification
- Operator actions
- Design calculations
- Surveillance testing and recent test results
- Adequacy of electrical power supply for motor and controls

- Thermal overload protection settings
- Protection coordination; Load in-rush and full load current
- Equipment protection from fire, flood, and water intrusion or spray
- Heat removal cooling water and ventilation
- Contactor and fuse ratings; Component adequacy for minimum voltage
- Seismic qualification

The team used Appendix B guidance for *Valves, Pumps, Instrumentation, and As-Built System*.

Design Review - Large Early Release Frequency (LERFs) (IP Section 02.02) (1 Sample)

- (1) Unit 1 Containment Pressure and Vacuum Relief Isolation Valves (1VC5 and 1VC6)
 - Material condition and installed configuration (e.g., visual inspection/walkdown)
 - Normal, abnormal, and emergency operating procedures
 - Consistency among design and licensing bases and other documents and procedures
 - Maintenance records and corrective action history
 - Control logic
 - Equipment/environmental controls and qualification
 - Operator actions
 - Design calculations
 - Surveillance testing and recent test results
 - Adequacy of electrical power supply for motor and controls
 - Range, accuracy, and setpoint of installed instrumentation
 - Heat removal cooling water and ventilation
 - Energy sources, air

The team used Appendix B guidance for *Valves, Pumps, Instrumentation, and As-Built System*.

Modification Review - Permanent Mods (IP Section 02.03) (5 Samples)

- (1) 80111452, Salem 2 Nuclear Instrumentation Upgrade
- (2) 80109929, Mitigating Systems Performance Indicator Non-Safety Related Auxiliary Feedwater Pump Modification
- (3) 80116286, Auxiliary Feedwater Room Cooler Controls Replacement
- (4) 80116637, Unit 2 Solid State Protection System Train A Wiring Rework Per TB-13-7
- (5) 80110461, 11, 21, & 22 Service Water Return Header

Review of Operating Experience Issues (IP Section 02.06) (3 Samples)

- (1) NRC Information Notice 19-02, Emergency Diesel Generator Excitation System Diode Failures, dated June 3, 2019
- (2) NRC Information Notice 15-01, Degraded Ability to Mitigate Flooding Events, dated January 9, 2015
- (3) NRC Information Notice 19-08 Flow Accelerated Corrosion Events, dated October 8, 2019

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On January 30, 2020, the inspectors presented the design basis assurance inspection (teams) inspection results to Mr. Charles McFeaters and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21M	Calculations	317099(15)-01	Weak Link and Seismic Analysis Reports	Revision 1
		ES-13-006(Q)	Breaker and Relay Coordination Calculation Safety-Related AC System	Revision 3
		ES-15.017(Q)	Salem Unit 1 & 2 Analytical Voltage Analysis	Revision 3
		S-C-CAN-MDC-2144	Minimum Containment Air Pressure Prior to a LOCA	Revision 1
		SC-CBV006-01	Containment Building Differential Pressure Indication LOOP Uncertainty	Revision 3
	Corrective Action Documents Resulting from Inspection	20839697		
		20843273		
		20843274		
		20843289		
		20843418		
		20843489		
		20843617		
		20843640		
		20843676		
		20843677		
		20843680		
		20843689		
		20843759		
		20843800		
		20843808		
20843831				
20843835				
20843837				
20843849				
20843904				
20843905				
20843906				
20843907				

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		20843908		
		20843962		
		20843974		
		20843982		
		20844003		
		20844005		
		20844017		
		20844059		
		20844060		
		20844105		
		20844131		
		20844146		
		20844147		
		20844154		
		20844157		
		20844157		
		20844165		
		20844171		
		20844181		
		20844182		
		20844194		
		20844197		
		20844240		
		20844244		
		20844252		
		20844264		
		20844321		
		20844322		
	Engineering Changes	80096586	Unit 1 & Unit 2 SSPS Circuit Card Upgrade	Revision 2
		80109929	Mitigating Systems Performance Indicator Non-Safety Related Auxiliary Feedwater Pump Modification	Revision 1
		80110461	11, 12, 21, and 22 Service Water Nuclear Return Header Isolation Valve, Access Branch, and WEKO Seal	Revision 2

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		80110461	No. 11, 12, 21, and 22 Service Water Nuclear Return Header Isolation Valve and Access Branch Pipe and WEKO Seal Installation 50.59 Review	Revision 1
		80111452	Salem 2 Nuclear Instrumentation Upgrade	Revision 2
		80116286	Auxiliary Feedwater Room Cooler Controls Replacement	Revision 0
		80116637	Unit 2 SSPS Train A Wiring Rework per TB-13-7	Revision 0
	Miscellaneous	IST-SC-INT5 Table 3-1	Inservice Testing Program Plan Valve Test Table	Revision 0
		LR-N-17-006	PSEG Letter to USNRC, "Focused Evaluation of External Flooding for Salem Generating Station, Units 1 and 2"	6/30/2017
		S1.OP-ST.DG-0013	1B Diesel Generator Endurance Run	4/11/2019
		TB-13-7	Westinghouse Technical Bulletin, SSPS New Design Universal Logic Board and Safeguards Driver Board 48 VDC Input	12/10/2013
	Procedures	ER-AA-430	Conduct of Flow Accelerated Corrosion Activities	Revision 9
		ER-AA-430-1001	Guidelines For Flow Accelerated Corrosion Activities	Revision 11
		OP-AA-102-106	Operator Response Time Program	Revision 0
		S1.MD-FT.4KV-0002(Q)	ESFAS Instrumentation Functional Test 1B 4KV Vital Bus Undervoltage	Revision 31
		S1.OP-AB.LOCA-0001(Q)	Shutdown LOCA	Revision 7
		S1.OP-AB.ZZ-0002	Flooding	Revision 4
		S1.OP-SO.CBV-0002	Containment Pressure – Vacuum Relief System Operation	Revision 21
		S1.OP-SO.DG-0002	1B Diesel Generator Operation	Revision 41
		S1.OP-ST.4KV-0001(Q)	Electrical Power Systems, 4KV Vital Bus Transfer	Revision 16
		S1.OP-ST.CBV-0001	Inservice Testing Containment Ventilation Valves	Revision 8
		S1.RA-ST.CBV-0001	Inservice Testing Containment Valves Acceptance Criteria	Revision 18

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		S2.OP-ST.AF-0002(Q)	Inservice Testing- 22 Auxiliary Feedwater Pump	Revision 18
		SC.OP-PT.AF-0001(Z)	Testing the MSPI Pump and Diesel	Revision 0
	Work Orders	60142009		
		70209851		