



**UNITED STATES**  
**NUCLEAR REGULATORY COMMISSION**  
REGION I  
2100 RENAISSANCE BLVD., Suite 100  
KING OF PRUSSIA, PA 19406-2713

October 26, 2017

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

**SUBJECT: SALEM NUCLEAR GENERATING STATION, UNITS NOS. 1 AND 2 –  
TEMPORARY INSTRUCTION 2515/191 INSPECTION REPORT NOS.  
05000272/2017010 AND 05000311/2017010**

Dear Mr. Sena:

On September 21, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Salem Nuclear Generating Station (SNGS) Units 1 and 2. The enclosed report documents the inspection results, which were discussed on September 21, with Mr. Charles McFeaters and other members of your staff.

The inspection examined activities conducted under your license as they relate to the implementation of mitigation strategies and spent fuel pool instrumentation orders (EA-12-049 and EA-12-051) and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with plant personnel. Based on the results of this inspection, no violations of NRC requirements were identified.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS).

P. Sena

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ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/readingrm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Anne E. DeFrancisco, Acting Chief  
Technical Support and Assessment Branch  
Division of Reactor Projects

Docket Nos. 50-272 and 50-311  
License Nos. DPR-70 and DPR-75

Enclosure:  
Inspection Report 05000272/2017010 and  
05000311/2017010  
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNITS NOS. 1 AND 2 –  
 TEMPORARY INSTRUCTION 2515/191 INSPECTION REPORT NOS.  
 05000272/2017010 AND 05000311/2017010 DATED OCTOBER 26, 2017

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**U.S. NUCLEAR REGULATORY COMMISSION****REGION I**

Docket Nos. 50-272 and 50-311

License Nos. DPR-70 and DPR-75

Report Nos. 05000272/2017010 and 05000311/2017010

Licensee: PSEG Nuclear LLC (PSEG)

Facility: Salem Nuclear Generating Station (SNGS), Units 1 and 2

Location: Hancocks Bridge, NJ 08038

Dates: September 18, 2017 through September 21, 2017

Inspectors: W. Cook, Senior Reactor Analyst, Division of Reactor Safety (DRS)  
E. Dipaolo, Senior Reactor Inspector, DRS  
T. Hedigan, Operations Engineer, DRS  
C. Lally, Project Engineer, Division of Reactor Projects (DRP)  
S. Haney, Resident Inspector Hope Creek, DRP  
A. Ziedonis, Resident Inspector Salem, DRP

Approved by: Anne E. DeFrancisco, Acting Chief  
Technical Support and Assessment Branch  
Division of Reactor Projects

## **SUMMARY OF FINDINGS**

Inspection Reports 05000272/2017010 and 05000311/2017010; 09/18/2017 – 09/21/2017; Salem Generating Station; Temporary Instruction (TI) 2515/191, Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans.

The inspection covered a one week inspection by a senior reactor analyst, an operations engineer, a senior reactor engineer, a reactor engineer, and two resident inspectors. No findings were identified. The U.S. Nuclear Regulatory Commission's (NRC's) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA5 Other Activities

##### TI 2515/191 – Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans

The objective of TI 2515/191, “Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans,” is to verify: (1) that licensees have adequately implemented the mitigation strategies as described in the licensee’s Final Integrated Plan (Agency-wide Documents Access and Management System (ADAMS) Accession No. ML16273A349) and the NRC’s plant safety evaluation (ADAMS Accession No. ML16351A182); (2) that licensees have installed reliable water-level measurement instrumentation in their spent fuel pools (SFPs); and (3) that licensees have implemented emergency preparedness enhancements as described in their site-specific submittals and NRC safety assessments, including dose assessment capability, enhancements to ensure that staffing is sufficient, and that communications can be maintained during beyond-design-basis external events.

The team verified that plans for complying with NRC Orders EA-12-049, “Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design Basis External Events,” (ADAMS Accession No. ML12054A735) and EA-12-051, “Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation,” (ADAMS Accession No. ML12056A044) were in place and were being implemented by PSEG. The team also verified that PSEG had implemented staffing and communication plans provided in response to the March 12, 2012, request for information letter and multi-unit dose assessment information provided per COMSECY-13-0010, “Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned,” dated March 27, 2013 (ADAMS Accession No. ML12339A262).

The team discussed the plans and strategies with PSEG personnel, reviewed documentation, completed a tabletop exercise involving a beyond-design-basis event leading to an extended loss of offsite power and, where appropriate, performed plant walk downs to verify that the strategies could be implemented as stated in PSEG’s submittals and the NRC staff prepared safety evaluation. For most strategies, this included verification that the strategy was feasible, procedures and/or guidance had been developed, training had been provided to plant staff, and required equipment had been identified and staged. Specific details of the team’s inspection activities are described in the following sections. Documents reviewed for each section of this report are listed in the Attachment.

## 1. Mitigation Strategies for Beyond-Design-Basis External Events

### a. Inspection Scope

The team examined PSEG's established guidelines and implementing procedures for the beyond-design-basis mitigation strategies. The team assessed how the PSEG staff coordinated and documented the interface/transition between existing off-normal and emergency operating procedures at SNGS with the newly developed mitigation strategies. The team selected a number of mitigation strategies and conducted plant walk downs with licensed operators and responsible plant staff to assess: the adequacy and completeness of the procedures; familiarity of operators with the procedure objectives and specific guidance; staging and compatibility of equipment; and the practicality of the operator actions prescribed by the procedures, consistent with the postulated scenarios.

The team verified that a preventive maintenance program had been established for the Diverse and Flexible Coping Strategies (FLEX) portable equipment, and that periodic equipment inventories were in place and being conducted. Additionally, the team examined the introductory and planned periodic/refresher training provided to the Operations and PSEG Emergency Response Organization (ERO) staff most likely to be tasked with implementation of the FLEX mitigation strategies. The team also reviewed the introductory and planned periodic training provided to the ERO personnel.

### b. Assessment

Based on samples selected for review, the team verified that PSEG satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittals and the associated safety evaluation. The team determined that PSEG was in compliance with NRC Order EA-12-049.

The team verified that PSEG satisfactorily:

- Developed and issued FLEX Support Guidelines (FSGs) to implement the FLEX strategies for postulated external events;
- Integrated their FSGs into their existing emergency operating procedures and off-normal procedures such that entry into and departure from the FSGs were clear when using existing plant procedures;
- Protected FLEX equipment from site-specific hazards;
- Developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;
- Trained their staff to ensure personnel proficiency in the mitigation of beyond-design-basis events; and
- Developed procedures to ensure that the necessary off-site FLEX equipment would be available from off-site locations.

The team verified that observations made during the inspection were entered into PSEG's corrective action program.

### c. Findings

No findings were identified.

## 2. Spent Fuel Pool Instrumentation

### a. Inspection Scope

The team examined SNGS's newly installed SFP instrumentation. Specifically, the team verified the sensors were installed as described in the plant specific submittals and the associated safety evaluation, and that the cabling for the power supplies and the indications for each channel were physically and electrically separated. In addition, the team verified that PSEG had evaluated the environmental conditions and accessibility of the instrumentation.

The team verified that PSEG had approved procedures for maintenance, testing, calibration, and use of the primary and backup SFP instrumentation channels. The team also verified that the procedures followed the industry guidance contained in Nuclear Energy Institute 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," and that these procedures were part of an existing PSEG process to be maintained.

### b. Assessment

Based on samples selected for review, the team determined that PSEG satisfactorily installed and established appropriate operating and maintenance controls for the SFP instrumentation as described in the plant specific submittals and the associated safety evaluation. The team determined that PSEG was in compliance with NRC Order EA-12-051.

The team verified that PSEG satisfactorily:

- Installed the SFP instrumentation sensors, cabling, and power supplies to provide physical and electrical separation as described in the plant specific submittals and safety evaluation;
- Installed the SFP instrumentation display in the accessible location, and environmental conditions as described in the plant specific submittals;
- Trained their staff to ensure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation; and
- Developed and issued procedures for maintenance, testing, and use of the reliable SFP instrumentation.

The team verified that observations made during the inspection were entered into PSEG's corrective action program.

### c. Findings

No findings were identified.



### 3. Staffing and Communication Request for Information

#### a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walk downs, the team verified that PSEG had implemented required changes to staffing, communications equipment, and facilities to support an extended loss of all AC power (ELAP) scenario as described in SNGS's staffing assessment and the NRC safety evaluation. The team also verified that PSEG had implemented dose assessment (including releases from SFPs) capability using site-specific dose assessment software, as described in PSEG's dose assessment submittal.

#### b. Assessment

The team reviewed information provided in PSEG's dose assessment submittal and in response to the NRC's March 12, 2012, request for information letter (ADAMS Accession No. ML12053A340), and verified that PSEG satisfactorily implemented enhancements pertaining to Near-Term Task Force Recommendation 9.3, response to a large scale natural emergency event that results in an ELAP and impedes access to the site.

The team verified the following:

- PSEG satisfactorily implemented required staffing changes to support an ELAP scenario;
- Emergency preparedness communications equipment and facilities were sufficient for dealing with an ELAP scenario; and
- PSEG implemented dose assessment capabilities (including releases from SFPs) using PSEG's site-specific dose assessment software and approach.

The team verified that observations identified during the inspection were entered into Entergy's corrective action program.

#### c. Findings

No findings were identified.

### 4OA6 Meetings, Including Exit

On September 21, 2017, the team presented the inspection results to Mr. Charles McFeaters, SNGS Vice President, and other members of the PSEG staff. The team verified that no proprietary information was retained by team members or documented in this report.

## **ATTACHMENT: SUPPLEMENTARY INFORMATION**

**SUPPLEMENTARY INFORMATION**

**KEY POINTS OF CONTACT**

Licensee personnel

C. McFeaters	SNGS Vice President (VP)
E. Carr	HCGS VP
P. Davison	Engineering VP
J. Fleming	Director, Compliance
S. Barr	EP Manager
J. Baker	FLEX Response Team Lead
C. Banner	Emergency Preparedness (EP)
J. Clancy	EP
S. Jones	EP
W. McTigue	Licensing
T. MacEwen	Compliance
W. Guthrie	Security
F. Powell	Supply
M. Cocking	Fire Protection
S. Bier	Operations
J. Hogate	Operations
S. Richardson	Engineering
P. Koppel	Maintenance
M. Shaffer	Training
M. Morales	Operations
R. Henriksen	Engineering
D. Franklin	Maintenance
R. White	Training
J. Gardiner	Contractor
D. Blount	Sargent-Lundy
M. Shervin	Sargent-Lundy

**LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED**

Opened and Closed

None

Discussed

None

**LIST OF DOCUMENTS REVIEWED**

- NEI 12-02, Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," Revision 1
- Temporary Instruction 2515/191, Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, Revision 1
- NEI 12-06, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, Revision 4

PSEG Letter, Salem Generating Station Unit 1 Compliance with March 12, 2012 NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049) and Final Integrated Plan for Units 1 and 2, dated September 28, 2016

PSEG Letter LR-N12-0351, PSEG Nuclear LLC's Assessment Report for Communications During and Extended Loss of AC Power, dated October 31, 2012

1/2-EOP-LOPA-1, Loss of All AC Power, Revision 31

1/2-ELOPA-4, Extended Loss of All AC Power, Revision 30

OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines, Revision 14

S1.OP-AB.LOOP-0001(Q), Loss of Offsite Power, Revision 31

S2.OP-AB.LOOP-0001(Q), Loss of Offsite Power, Revision 30

S1.OP-FS.FLX-0004(Q), ELAP DC Bus Load Shed Management, Revision 0

S2.OP-FS.FLX-0004(Q), ELAP DC Bus Load Shed Management, Revision 0

SC.OP-PM.FLX-0002(Z), FLEX Equipment Inventory, Revision 1

SH.OP-PT.FLX-480(Z), FLEX 480V Caterpillar Diesel Generators, Revision 1

221416-B-9545, Salem Wiring Diagram Emergency Lighting Panels, MAC 115V Distribution Cabinet, and 125V DC Distribution

220813-B-9544, Salem Wiring Diagram 115V AC Vital Instrument Bus

OP-SA-112-101-1001, Rev 6, Shift Turnover Responsibilities

OU-SA-105, Rev 10, Shutdown Safety Management Program – Salem Annex

S1/2.OP-FS.FLX-0013, Rev 0, Transition from FLEX Equipment

EM-SA-100-1000, Rev 1, Response to Beyond Design basis External events Program Document – Salem Generating Station

2-EOP-TRIP-1, Reactor Trip or Safety Injection, Sheet 1 of 6, Revision 32

EM-AA-100-1002, Diverse and Flexible Coping Strategies (FLEX) Overview, Revision 0

EM-AA-100-1005, FLEX Response Coordination Guidelines, Revision 3

EM-SA-100-1000, Response to Beyond Design Basis External Events Program Document Salem Generating Station, Revision 1

MA-AA-716-002-1002, Facilities Maintenance Guidelines, Revision 4

SC.OP-AB.ZZ-0001, Adverse Environmental Conditions, Revision 16

SH.OP-AM.FLX-0050, Pre-Storm Storage and Protection of Outdoor FLEX Equipment, Revision 0

80110419, Salem Unit 2 Mechanical Connections (FLEX), Revision 1

80112074-0025, Outdoor Storage of FLEX Equipment in Extreme Cold and Hot Weather

80119972-0010, Fukushima FLEX Check-In Self-Assessment (CISA)

Salem Units 1 and 2 Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation Related to Orders EA-12-049 and EA-12-051, Dated January 19, 2017, ML16351A182

Salem Compliance Letter with Order EA-12-049 and Final Integrated Plan for Units 1 and 2, Dated September 28, 2016, ML16273A349

Notifications

20774996	20775006	20775689	20775722
20775000	20775208	20775690	20775210
20775002	20775663	20775692	20775207
20775003	20775676	20775699	20775208
20775004	20775677	20775731	
20775005	20775678	20775736	

Work Orders

30289996	30290610	30291005	30292189
30290605	30290611	30291006	30292190
30290606	30290612	30291007	30309038
30290607	30290613	30291008	30309039
30290608	30291003	30291009	30310544
30290609	30291004	30291010	30310545

**LIST OF ACRONYMS**

ADAMS	Agency-wide Document Access and Management System
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
ELAP	Extended Loss of all AC Power
EP	Emergency Preparedness
ERO	Emergency Response Organization
FLEX	Diverse and Flexible Coping Strategies
FSG	FLEX Support Guidelines
HCGS	Hope Creek Generating Station
SNGS	Salem Nuclear Generating Station
NRC	Nuclear Regulatory Commission, U.S.
PSEG	Public Service Enterprise Group
SFP	Spent Fuel Pool
TI	Temporary Instruction