



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PENNSYLVANIA 19406-2713**

February 14, 2018

Mr. Anthony J. Vitale  
Site Vice President  
Entergy Nuclear Operations, Inc.  
Indian Point Energy Center  
450 Broadway, General Services Building  
P.O. Box 249  
Buchanan, NY 10511-0249

**SUBJECT: INDIAN POINT NUCLEAR GENERATING – INTEGRATED INSPECTION  
REPORT 05000247/2017004 AND 05000286/2017004**

Dear Mr. Vitale:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Indian Point Nuclear Generating, Units 2 and 3. On February 1, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. On February 13, 2018, the NRC inspectors discussed the addition of an unresolved item with your staff. The results of this inspection are documented in the enclosed report.

The NRC inspectors did not identify any finding or violation of more than minor significance.

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 the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

**/RA/**

Daniel L. Schroeder, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Docket Nos. 50-247 and 50-286  
License Nos. DPR-26 and DPR-64

Enclosure:  
Inspection Report 05000247/2017004  
and 05000286/2017004 w/Attachment:  
Supplementary Information

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SUBJECT: INDIAN POINT NUCLEAR GENERATING – INTEGRATED INSPECTION  
 REPORT 05000247/2017004 AND 05000286/2017004 dated February 14, 2018

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 ADAMS Accession No. **ML18045A497**

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION I**

Docket Nos. 50-247 and 50-286

License Nos. DPR-26 and DPR-64

Report Nos. 05000247/2017004 and 05000286/2017004

Licensee: Entergy Nuclear Northeast (Entergy)

Facility: Indian Point Nuclear Generating, Units 2 and 3

Location: 450 Broadway, Generation Services Building  
Buchanan, NY 10511-0249

Dates: October 1, 2017, through December 31, 2017

Inspectors: B. Haagensen, Senior Resident Inspector  
A. Siwy, Resident Inspector  
M. Rossi, Acting Resident Inspector  
C. Safouri, Acting Resident Inspector  
O. Masnyk Bailey, Health Physicist  
E. Burket, Reactor Inspector  
J. DeBoer, Emergency Preparedness Inspector  
J. Furia, Senior Health Physicist  
D. Silk, Senior Operations Engineer  
K. Warner, Health Physicist

Approved By: Daniel L. Schroeder, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

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**SUMMARY**

Inspection Report 05000247/2017004 and 05000286/2017004; 10/01/2017 – 12/31/2017; Indian Point Nuclear Generating (Indian Point), Units 2 and 3; Routine Integrated Inspection Report.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional 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

### Summary of Plant Status

Unit 2 began the inspection period at 100 percent power. On December 9, 2017, the operators shutdown Unit 2 to facilitate repairs on the 21 reactor coolant pump. Following repairs, the operators returned the unit to 100 percent power on December 23, 2017. Unit 2 remained at or near 100 percent power for the remainder of the inspection period.

Unit 3 began the inspection period at 100 percent power. On November 3, 2017, the reactor tripped due to a turbine trip in response to loss of main generator exciter field. Operators returned Unit 3 to 100 percent power on November 10, 2017. Unit 3 remained at or near 100 percent power for the remainder of the inspection period.

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**

1R01 Adverse Weather Protection (71111.01 – 3 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of Entergy's readiness for the onset of seasonal low temperatures. The inspectors reviewed procedure OAP-048, "Seasonal Weather Preparation (Units 2 and 3)." The focused areas were the FLEX storage building, FLEX staging areas, the refueling water storage tanks, the primary water storage tanks, and the condensate storage tanks. The inspectors reviewed the final integrated plans, operator rounds logs, and the corrective action program (CAP) to determine what temperatures or other seasonal weather could challenge these systems and to ensure Entergy had adequately prepared for these challenges. The inspectors reviewed station procedures, including Entergy's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. This sample was performed in conjunction with Temporary Instruction 2515/191. See also Indian Point Inspection Report 05000247/2017010 and 05000286/2017010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18031A358). Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 External Flooding

a. Inspection Scope

During the week of October 11 to 17, 2017, the inspectors performed an inspection of the external flood protection measures for Units 2 and 3. The inspectors reviewed

technical specifications (TSs), procedures, design documents, and Updated Final Safety Analysis Report (UFSAR), Chapter 2.5, which depicted the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by internal flooding. The inspectors conducted a general site walkdown of external areas of the plant, interior areas requiring actions by procedure, and locations of flood mitigation equipment to ensure that Entergy erected flood protection measures in accordance with design specifications. The inspectors also reviewed policies and operating procedures for mitigating external flooding during severe weather to confirm that, overall, Entergy had established adequate measures to protect against external flooding events and, more specifically, that credited operator actions were adequate.

b. Findings

No findings were identified.

.3 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed Entergy's preparations for the onset of snow accumulations on December 9, 2017. The inspectors reviewed the implementation of adverse weather preparation procedures including OAP-48, "Seasonal Weather Preparation (Units 2 and 3)," before the onset of and during this adverse weather condition. The inspectors walked down the outside areas of the site to ensure no challenges from snow blockage of safety systems air intakes and that there were no problems as a result of the severe weather.

The inspectors verified that plant modifications, maintenance activities (i.e., temporary hazard barrier removal), new evolutions, procedure revisions, or operator workarounds implemented to address periods of adverse weather did not degrade maintenance rule structures, systems, and components (SSCs). The inspectors verified that operator actions defined in Entergy's adverse weather procedure maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel. The inspectors discussed cold weather preparedness with operators and maintained an awareness of cold weather issues throughout the storm.

b. Findings

No findings were identified.

## 1R04 Equipment Alignment

### .1 Partial System Walkdowns (71111.04Q – 4 samples)

#### a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

#### Unit 2

- 22 residual heat removal (RHR) train after maintenance on October 2, 2017
- 21 and 22 RHR cooling loop during lowered inventory for a planned outage on December 14, 2017

#### Unit 3

- 32 auxiliary boiler feed pump on December 15, 2017
- Containment spray system on December 19, 2017

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TSs, work orders (WOs), condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Entergy had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

#### b. Findings

No findings were identified.

### .2 Full System Walkdown (71111.04S – 1 sample)

#### a. Inspection Scope

On October 26, 2017, the inspectors performed a complete system walkdown of accessible portions of the Unit 2 spent fuel pool cooling system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability and hanger and support functionality. The inspectors performed field walkdowns of accessible portions of the systems to verify as-built system configuration matched plant documentation and that system components remained operable. The inspectors confirmed that systems and components were aligned correctly and free from interference from temporary services or isolation boundaries. The inspectors also



examined the material condition of the components for degradation to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CRs and WOs to ensure Entergy appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 6 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Entergy controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment were available for use as specified in the area pre-fire plan (PFP), and the passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out-of-service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

Unit 2

- Intake structure, including service water (SW) pump pen, circulating water pumps, and traveling screen (PFP-264) on October 11, 2017
- Piping bay and pipe tunnel (PFP-205, PFP-206, and PFP-210) on October 18, 2017
- Electrical tunnel and electrical penetration fan house (PFP-213 and PFP-214) on October 19, 2017

Unit 3

- General floor plan, radioactive machine shop building (PFP-317, PFP-318, and PFP-319) on October 23, 2017
- Fan house (PFP-310, PFP-311, and PFP-312) on October 31, 2017
- Fan house (PFP-313 and PFP-314) on October 31, 2017

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on November 29, 2017, that involved a fire in the hydrazine tank in the auxiliary boiler feed pump room in Unit 3. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The

inspectors verified that Entergy identified deficiencies, openly discussed them in a self-critical manner at the post drill debrief, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with Entergy's fire-fighting strategies. The inspectors reviewed CRs and Entergy document EN-TQ-125, "Fire Brigade Drills," Attachment: Drill Report, and compared Entergy's noted formal observations to the inspector's evaluation.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07A – 1 sample)

a. Inspection Scope

On October 10, 2017, the inspectors reviewed the 23 emergency diesel generator (EDG) jacket water heat exchanger to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Entergy's commitments to NRC Generic Letter 89-13, "SW System Requirements Affecting Safety-Related Equipment." The inspectors observed visual and eddy current inspections and data for the 23 EDG jacket water heat exchanger and compared previous inspection data. The inspectors verified that Entergy initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance

.1 Licensed Operator Regualification (71111.11A – 2 samples)

a. Inspection Scope

On December 27, 2017, an NRC region-based inspector conducted an in-office review of results for Units 2 and 3 Entergy-administered annual operating test for operators.

Examination Results

Results of the annual operating tests for Units 2 and 3 were reviewed to determine if pass/fail rates were consistent with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 11, and NRC Inspection Manual Chapter 0609, Appendix I, "Operator Regualification Human Performance Significance Determination Process." The review verified that the failure rate (individual or crew) did not exceed 20 percent.

Unit 2

- Two out of forty-five operators failed at least one section of the annual exam. The overall individual failure rate was 4.4 percent.
- Zero out of six crews failed the simulator test. The crew failure rate was 0 percent.

Unit 3

- One out of forty-nine operators failed at least one section of the annual exam. The overall individual failure rate was 2 percent.
- Zero out of six crews failed the simulator test. The crew failure rate was 0 percent.

b. Findings

No findings were identified.

.2 Licensed Operator Regualification (71111.11B – 1 sample)

a. Inspection Scope

The Unit 3 operating tests for the weeks of October 16 to 20 and October 23 to 27, 2017, were reviewed for quality and performance.

The following Unit 3 inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 11, and Inspection Procedure Attachment 71111.11, "Licensed Operator Regualification Program."

Written Examination Quality

The inspectors reviewed two Unit 3 written examinations (reactor operator and senior reactor operator) administered during the 2017 examination cycle for qualitative and

quantitative attributes as specified in Appendix B of Attachment 71111.11, "Licensed Operator Requalification."

#### Operating Test Quality

Twelve job performance measures (JPMs) and eight scenarios for Unit 3 were reviewed for qualitative and quantitative attributes as specified in Appendix C of 71111.11, "Licensed Operator Requalification Program."

#### Licensee Administration of Operating Tests

Observations were made of the Unit 3 dynamic simulator exams and JPMs administered during the week of October 16, 2017. These observations included facility evaluations of crew and individual performance during the dynamic simulator exams and individual performance of JPMs.

#### Examination Security

The inspectors assessed whether facility staff properly safeguarded exam material. JPMs, scenarios, and written examinations were checked for excessive overlap of test items.

#### Remedial Training and Re-Examinations

No remediation plans or examinations were because there were no recent failures.

#### Conformance with Operator License Conditions

Medical records for four senior reactor operator licenses and five reactor operator licenses from Unit 3 were reviewed to assess conformance with license conditions. All records reviewed were satisfactory.

Proficiency watch standing records for Unit 3 licensed operators were reviewed for the first three quarters of 2017. All active licensed operators met the watch standing requirements to maintain an active license.

The reactivation plan for four Unit 3 licensed operators were reviewed to assess the effectiveness of the reactivation process. The reactivation was successfully processed in accordance with site procedures.

Records for the participation of Unit 3 licensed operators in the requalification program from January 2016 through September 2017 were reviewed. Records for the performance of licensed operators on annual requalification operating test exams results were reviewed for 2016.

#### Simulator Performance

The Unit 3 simulator performance and fidelity was reviewed for conformance to the reference plant control room. A sample of simulator deficiency reports was also reviewed to ensure facility staff addressed identified modeling problems. Simulator test documentation was also reviewed.

### Problem Identification and Resolution

A review was conducted of recent Unit 3 operating history documentation found in inspection reports, Entergy's CAP, and the most recent NRC plant issues matrix. The inspectors also reviewed specific events from Entergy's CAP which indicated possible training deficiencies to verify that they had been appropriately addressed. The senior resident inspector was also consulted for insights regarding licensed operators' performance. These reviews did not detect any operational events that were indicative of possible training deficiencies.

#### b. Findings

No findings were identified.

### .3 Licensed Operator Regualification (71111.11Q – 4 samples)

#### Unit 2

##### Quarterly Review of Licensed Operator Regualification Testing and Training

#### a. Inspection Scope

The inspectors observed licensed operator simulator training on November 2, 2017. The scenario included elevated reactor coolant system (RCS) activity and a physical loss of the Unit 2 condensate storage tank. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

#### b. Findings

No findings were identified.

#### Unit 3

##### Quarterly Review of Licensed Operator Performance in the Main Control Room

#### a. Inspection Scope

The inspectors observed and reviewed the reactor startup for criticality and power ascension on November 8, 2017. The inspectors observed infrequently performed test or evolution briefings, pre-shift briefings, and reactivity control briefings to verify that the briefings met the criteria specified in Entergy's administrative procedure EN-OP-115, "Conduct of Operations." Additionally, the inspectors observed test performance to

verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on November 16, 2017, which included two rapid power reduction scenarios from 100 percent. In the first scenario, the power reduction was caused by a steam leak on the main boiler feed pump (MBFP) steam chest and was terminated by the trip of the MBFP. The second scenario was expedited shutdown from 100 percent initiated by a reported aircraft threat. The shift manager declared a notification of unusual event. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems. The inspectors also observed a classroom training session on operability determinations. The inspectors evaluated training effectiveness and the use of case studies to reinforce key learning objectives.

b. Findings

No findings were identified.

Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed the synchronization of the main generator to the grid and subsequent power ascension on November 9, 2017. The inspectors observed infrequently performed test or evolution briefings, pre-shift briefings, and reactivity control briefings to verify that the briefings met the criteria specified in Entergy's administrative procedure EN-OP-115, "Conduct of Operations." Additionally, the inspectors verified that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 4 samples)Routine Maintenance Effectivenessa. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on SSC performance and reliability. The inspectors reviewed, CAP documents, maintenance WOs, and maintenance rule basis documents to ensure that Entergy was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each SSC sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.65 and verified that the (a)(2) performance criteria established by Entergy was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Entergy was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

Unit 2

- 22 MBFP from October 23 to November 8, 2017
- RCS, 21 reactor coolant pump seal degradation, on December 28, 2017

Unit 3

- Chemical and volume control system on December 18, 2017

Units 2 and 3

- The inspectors reviewed Entergy's Maintenance Rule (a)(3) assessment on December 14, 2017. The inspectors verified that the periodic evaluation was performed in accordance with 10 CFR 50.65(a)(3), and that it included a review of the effectiveness of corrective actions, (a)(1) system goals, (a)(2) performance criteria, monitoring, and post-maintenance activities. The inspectors verified that operating experience has been taken into account where practicable and that Entergy made appropriate adjustments as a result of periodic evaluation. The inspectors also verified that the periodic evaluation was performed less than 24 months since the last periodic evaluation.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Entergy performed

the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Entergy performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Entergy performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

### Unit 2

- Walkdown and verification of station protected equipment while Unit 2 station air compressor was out of service on October 3, 2017
- Planned Yellow risk for open phase detection modification on October 13, 2017
- 22 SW pump and motor replacement on November 22, 2017

### Unit 3

- 31 RHR inoperable while load sequencer was out of service for surveillance testing on November 14, 2017
- Planned Yellow large early release frequency risk for 33 EDG two-year maintenance and inspection on November 28, 2017

#### b. Findings

No findings were identified.

#### 1R15 Operability Determinations and Functionality Assessments (71111.15 – 4 samples)

##### a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

### Unit 2

- Through-wall leak on SWN FCV-1176 drain line fitting (CR-IP2-2017-03616) on October 7, 2017
- RHR line A-98 through-wall leak (CR-IP2-2017-05238) on December 21, 2017
- Degraded reactor pressure vessel (RPV) studs (CR-IP2-2017-05245) prior to restart on December 21, 2017
- Pressurizer level transmitters failed channel check (CR-IP2-2017-05401) on December 21, 2017

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and



the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to Entergy's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Entergy. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 4 samples)

Permanent Modifications

a. Inspection Scope

The inspectors reviewed the modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

Unit 2

- EC-52526, Add Open Phase Detection System to Station Auxiliary Transformer and Gas Turbine Auto Transformer
- EC-72951, RPV Oversized O-Ring Modification

Unit 3

- EC-61654 for declassification of the component cooling water (CCW) heat exchanger discharge line from American Society of Mechanical Engineers (ASME) Class III to B31.1 and implementation of carbon fiber wrap repairs

Units 2 and 3

- EC-45720, Beyond Design Basis External Event Phase II Coping with On-Site FLEX Equipment – Electrical (completed in conjunction with Temporary Instruction 2515-191)

b. Findings

Introduction. The inspectors identified an unresolved item (URI) during the inspection. The inspectors determined that additional NRC review and evaluation was required to

determine whether the modification was adequate to ensure the associated portion of the SW system continued to meet the design basis as described in the Unit 3 UFSAR.

Description. In the process of performing Generic Letter 89-13 program inspections on Unit 3 SW system piping, Entergy identified a degraded weld on SW line 405. The minimum wall thickness was determined to be less than allowed per the Generic Letter 89-13 program. Entergy designed a carbon fiber reinforced polymer (CFRP) wrap repair to provide structural integrity around the degraded weld using methodology described in ASME PCC2-2006, "Repair of Pressure Equipment and Piping," and ASME B31.1, "Power Piping," 1967 edition. Entergy's CFRP repair design does not take credit for the existing pipe at the degraded weld location.

The inspectors noted that the portion of the SW pipe where the CFRP wrap was installed was originally designed to meet seismic Category I criteria since a failure of that pipe could potentially impact the safety-related function of the RHR pumps. In accordance with the Unit 3 UFSAR, seismic Category I systems were designed and analyzed to withstand ground accelerations resulting from the site specific operating basis earthquake and design basis earthquake. Section 16.1.3 of the Unit 3 UFSAR states that seismic Category I piping having a diameter of six inches or more were initially designed statically using spacing tables, and a multi-degree-of-freedom dynamic analysis was performed to confirm the static design and analysis. The computer code ADLPIPE was used for the dynamic analysis.

The inspectors reviewed the results of the ADLPIPE stress analysis performed in 1979 and noted that the material properties of the carbon steel pipe were used as input values for the analysis. The inspectors also noted that the forces and bending moments determined from the original seismic stress analysis were used to design the CFRP wrap repair. The inspectors questioned whether it was appropriate to use the original seismic stress analysis values to design a CFRP wrap repair when the material properties of the carbon fiber would be different from the original carbon steel pipe. Since the ADLPIPE analysis used material property inputs, such as weight and modulus of elasticity, the inspectors questioned whether the forces and bending moments calculated would differ significantly between a carbon steel pipe and a CFRP.

Based on the inspectors' concerns, it was unclear whether the modification to SW line 405 was designed in such a manner to ensure the pipe continued to be qualified as seismic Category I. The inspectors did not have an immediate safety concern based on a review of calculation IP-CALC-17-00016 that demonstrated that a postulated crack in line 405 in the PAB would produce a leak rate of approximately 52 gpm, which was less than the design capacity of the floor drainage system in the PAB.

The inspectors will coordinate with NRC's Office of Nuclear Reactor Regulation to review the adequacy of Entergy's modification to the SW system to determine if this issue constitutes a violation and to ensure Entergy is meeting the applicable NRC regulations and requirements. Pending resolution and determination of any potential enforcement actions, this issue is a URI. **(URI 05000286/2017004-01, Adequacy of Entergy's Modification to Meet Seismic Category I Design Requirements)**

1R19 Post-Maintenance Testing (71111.19 – 7 samples)a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, confirmed work site cleanliness was maintained, and witnessed the test or reviewed test data to verify quality control hold points were performed and checked and that results adequately demonstrated restoration of the affected safety functions.

Unit 2

- 22 RHR pump after maintenance on October 2, 2017 (this sample was part of an in-depth review of the 22 RHR train)
- 22 containment spray pump 480V breaker swap on October 24, 2017
- 22 SW pump and motor replacement on November 22, 2017 (this sample was part of an in-depth review of the 22 SW pump)
- 21 reactor coolant pump following seal replacement on December 20, 2017

Unit 3

- SW system to fan coil unit temperature control valve (TCV)-1104 repair and support welding on November 6, 2017
- 31 CCW pump after shaft and bearing replacement on November 7, 2017
- 33 EDG two-year preventative maintenance and inspection on November 28, 2017

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 –2 samples).1 3FO17A Forced Outage to Repair Main Generator Exciter Fielda. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 3 unplanned outage (3FO17A) to repair the main generator exciter field, which was conducted on November 3 to 10, 2017. The inspectors reviewed Entergy's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and startup and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable TSs when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Status and configuration of electrical systems and switchyard activities to ensure that TSs were met
- Activities that could affect reactivity
- Control of work activities inside containment
- Control room operators during planned shutdown operations
- Reactor startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

.2 2PO17C Planned Outage to Replace 21 Reactor Coolant Pump Seal Package and Repair RPV O-Ring

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 planned outage (2PO17C) which was conducted on December 8 to 24, 2017. The inspectors reviewed Entergy's development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and startup and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable TSs when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Status and configuration of electrical systems and switchyard activities to ensure that TSs were met
- Activities that could affect reactivity
- Control room operators during planned shutdown operations
- Closeout of containment to verify that debris had not been left which could block the ECCS suction strainers
- Reactor startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and Entergy's procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

Unit 2

- 2-PT-Q027A, 21 Auxiliary Feed Pump Test and Valve Cycling, on October 16, 2017 (inservice test)
- 2-PT-Q034A, Auxiliary Feedwater steam supply PCV-1310 A and B Valve Cycling, on October 31, 2017
- 2-PT-Q026B, 22 SW Pump, and 2-PT-Y045B, 22 SW Pump Full Flow Test, on November 22, 2017
- 2-PC-R3, Pressurizer Level LT-459 Optimization, on December 21, 2018

Unit 3

- 3-PT-M14B, Safety Injection System, on October 16, 2017

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**1EP4 Emergency Action Level (EAL) and Emergency Plan Changes (71114.04 – 1 sample)a. Inspection Scope

Entergy implemented various changes to the Indian Point EALs, Emergency Plan, and Implementing Procedures. Entergy had determined that, in accordance with 10 CFR 50.54(q)(3), any change made to the EALs, Emergency Plan, and its lower-tier implementing procedures, had not resulted in any reduction in effectiveness of the Plan, and that the revised Plan continued to meet the standards in 50.47(b) and the requirements of 10 CFR Part 50, Appendix E.

The inspectors performed an in-office review of all EAL and Emergency Plan changes submitted by Entergy as required by 10 CFR 50.54(q)(5), including the changes to lower-tier emergency plan implementing procedures, to evaluate any potential reductions in effectiveness of the Emergency Plan. This review by the inspectors was not documented in an NRC Safety Evaluation Report and does not constitute formal

NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The requirements in 10 CFR 50.54(q) were used as reference criteria.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**Cornerstone: Public Radiation Safety and Occupational Radiation Safety**

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08 – 6 samples)

a. Inspection Scope

The inspectors verified the effectiveness of Entergy's programs for processing, handling, storage, and transportation of radioactive material. The inspectors used the requirements of 49 CFR Part 170-177; 10 CFR Part 20, 61, and 71; applicable industry standards; regulatory guides; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted an in-office review of the solid radioactive waste system description in the UFSAR, the process control program, and the recent radiological effluent release report for information on the types, amounts, and processing of radioactive waste disposed. The inspectors reviewed the scope of quality assurance audits performed for this area since the last inspection.

Radioactive Material Storage (1 sample)

The inspectors observed radioactive waste container storage areas, verified the postings and controls, and that Entergy had established a process for monitoring the impact of long-term storage of the waste.

Radioactive Waste System Walkdown (1 sample)

The inspectors walked down the following:

- Accessible portions of liquid and solid radioactive waste processing systems to verify current system alignment and material condition
- Abandoned in-place radioactive waste processing equipment to review the controls in place to ensure protection of personnel
- Changes made to the radioactive waste processing systems since the last inspection
- Processes for mixing and transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers
- Current methods and procedures for dewatering waste

Waste Characterization and Classification (1 sample)

The inspectors identified radioactive waste streams and reviewed radiochemical sample analysis results to support radioactive waste characterization. The inspectors reviewed the use of scaling factors and calculations to account for difficult-to-measure radionuclides.

Shipment Preparation (1 sample)

The inspectors reviewed the records of shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and Entergy's verification of shipment readiness.

Shipping Records (1 sample)

The inspectors reviewed selected non-accepted package shipment records.

Problem Identification and Resolution (1 sample)

The inspectors assessed whether problems associated with radioactive waste processing, handling, storage, and transportation were identified at an appropriate threshold and properly addressed in Entergy's CAP.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**4OA1 Performance Indicator Verification (71151 – 2 samples)Mitigating Systems Performance Indexa. Inspection Scope

The inspectors reviewed Entergy's submittals for the following Mitigating Systems Cornerstone performance indicators for the period October 1, 2016, through September 30, 2017:

Unit 2

- Safety System Functional Failures (MS05)

Unit 3

- Safety System Functional Failures (MS05)

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed Entergy's operator narrative logs, CRs,

mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 3 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, “Problem Identification and Resolution,” the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Entergy entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Entergy performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, “Problem Identification and Resolution,” to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by Entergy outside of the CAP, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed Entergy’s CAP database for the third and fourth quarters of 2017 to assess degraded conditions written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily CR review (Section 4OA1).

b. Findings and Observations

The inspectors noted that another failure of the inner and outer RPV O-rings had occurred on Unit 2 in December 2017. The recent trend in O-ring failures was previously documented as an annual problem identification and resolution sample in the last quarterly report (Indian Point Integrated Inspection Report 05000247/2017003 and 05000286/2017003 (ADAMS Accession No. ML17303A977)). The inspectors had noted



that this trend was continuing and observed that several causal analyses may not adequately address the underlying reasons for this trend to prevent recurrence.

The RPV O-ring seal is designed not to leak as stated in the final safety analysis report. If a leak occurs, this constitutes a degraded condition that is required to be corrected under 10 CFR Part 50, Appendix B, Criteria XVI, "Corrective Actions." If the leak deteriorates to a point where the leak rate exceeds the limits of TS 3.4.13, "Operational Leakage," the reactor is required to be shutdown. Entergy continuously monitors operational leakage during reactor operations. In addition, TS 3.4.15, "Leakage Detection Instrumentation," requires the RCS leak detection instrumentation to be operable whenever the RCS is pressurized. These TSs provide reasonable certainty that any leakage past the O-ring seals that is a small fraction of TS limits will be detected and appropriate action will be taken to shut down the reactor if necessary. The operational leakage monitored from Unit 2 reactor prior to the outage was less than 10 percent of the TS 3.4.13 leakage limits during the last fuel cycle. Units 2 and 3 use a double, redundant O-ring seal between the RPV and the reactor head to maintain RCS integrity. Two metallic O-rings are installed in concentric machined grooves to maintain the boundary integrity of the RPV head. The seal design specifies the inner O-ring to seal RCS pressure and the outer O-ring is a redundant feature. If the inner O-ring leaks, the leak will be detected in a leakoff line and an isolation valve will be closed to stop the leakage. Valve closure transfers the RCS pressure seal from the inner O-ring seating surface to the redundant, outer O-ring seal. This design ensures that only one O-ring seal is in service at a time, restraining RCS pressure. If the inner O-ring leaks, the RCS water that is trapped between the inner and outer O-ring seal becomes pressurized to RCS pressure and this pressure ensures that the water will be forced through the leakoff detection line into a drain tank in containment.

Entergy replaced the failed O-rings with newly designed O-rings that had greater malleability to better conform to any minor defects in the RPV flange seating surfaces. After restarting the reactor, the O-rings were visually monitored for leakage and no leakage was identified. The degraded condition was corrected as required under 10 CFR Part 50, Appendix B, Criteria XVI.

Introduction. The inspectors identified a URI during the inspection. The inspectors determined that additional NRC review and evaluation was required to determine whether the RPV O-ring leakage detection system worked as designed, and whether the as-found degraded RPV bolting system maintained past operability.

Description. On December 9, 2017, during a planned shutdown to replace the 21 reactor coolant pump seal, Unit 2 identified an RCS leak from inner and outer RPV flange O-rings. Entergy visually identified boric acid traces on the RPV head insulation blocks and determined that the outer O-ring seal had been leaking. Entergy noted dried boric acid deposits on the external RPV flange surfaces inside containment. In March 2017, Entergy recognized that the inner O-ring flange seal was leaking and the outer O-ring seal in service. Entergy prepared an operational decision making input document that specified trigger levels and was designed to detect leakage through the outer O-ring seal in sufficient time to take action to prevent boric acid corrosion on the RPV studs. None of the operational decision making input trigger levels had been exceeded prior to shutdown, although there had been slight indications of increased RCS leakage. Entergy identified corrosive degradation of six of the 54 installed RPV studs during the disassembly of the RPV head to replace the leaking O-rings. The inspectors determined

that additional information is required to evaluate potential performance deficiencies related to the leak-off system performance and monitoring with the outer O-ring in service.

Upon removal of the reactor vessel head, Entergy identified that six RPV studs had been exposed to boric acid leakage and experienced corrosive degradation. These studs are 6.8 inches in diameter and are made of carbon steel that is susceptible to corrosion by boric acid. Stud 20 could not be extracted from the RPV despite numerous attempts to free this stud from the vessel using the hydraulic wrench. For engineering analysis purposes, Stud 20 was conservatively assumed to be failed. Stud 23 did not meet the ASME, Section XI criteria for reuse without further evaluation and was replaced prior to restart. The other RPV studs met the acceptance criteria for reuse and were cleaned, inspected, and reinserted. Entergy and its vendor had previously completed an analysis that showed that the reactor vessel studs would retain sufficient closing strength with one RPV stud removed. Entergy is evaluating the as-found condition of the Unit 2 RPV studs for past operability, conservatively assuming that two RPV studs (20 and 23) were failed. The inspectors will review this operability evaluation as part of their inspection of this URI.

Entergy performed a causal analysis and concluded that the RCS leak rate was small enough that it could not be detected by the plant leakage monitoring systems. They also concluded that the outer RPV flange leak-off drain line was clogged and would not provide reliable detection of the RCS leak.

Finally, regarding extent of condition, Unit 3 has recently demonstrated the capability to reliably detect RCS leakage through the RPV flange O-ring seals on two occasions in 2015 and 2017. The inspectors plan to review the design and performance of Unit 3 leak-off system to understand any differences in design and performance between Unit 2 and Unit 3.

Closure of these issues of concern will require a determination if performance deficiencies existed; and if so, is the performance deficiency more than minor. Entergy entered these issues of concern into the corrective action process (CR-IP2-2017-05095 and CR-IP2-2018-00756). **(URI 05000247/2017004-02, Unidentified Reactor Pressure Vessel O-Ring Leakage Caused Degraded Studs)**

.3 Annual Sample: Re-Classification of SW Line 405

a. Inspection Scope

The inspectors performed an in-depth review of Entergy's evaluation and determination to re-classify a portion of the Unit 3 SW system from safety-related to augmented quality related. Specifically, Entergy re-classified a portion of SW line 405 from safety-related to augmented quality related in order to support a repair of a degraded section of the pipe. See Section 1R18 of this inspection report for details of the repair and one URI identified during the inspection.

The inspectors reviewed the associated 10 CFR 50.59 screen, engineering evaluation, and safety classification worksheets to evaluate whether Entergy's conclusions were reasonable and in accordance with NRC regulations and guidelines. The inspectors also performed a walkdown of SW line 405 in the PAB and interviewed engineering personnel

to confirm the functions identified in the engineering evaluations were consistent with the design basis.

b. Findings and Observations

No findings were identified.

The Unit 3 UFSAR, Section 9.6.1, describes the design of the SW system to supply cooling water from the Hudson River to various heat loads in the plant including the CCW heat exchangers. The portion of line 405 that Entergy re-classified was located downstream of valve SWN-35-2, at the exit of the CCW heat exchangers. Entergy determined that the safety-related cooling function of the SW system had been accomplished once the cooling water exited the component cooling heat exchangers. The function of the downstream portion of line 405 is to return the cooling water exiting the heat exchangers to the discharge canal.

As documented in engineering evaluation EC-71892, Entergy determined that line 405 must continue to meet the requirements of seismic Category I. Therefore, line 405 could not be re-classified any lower than augmented quality related. Augmented quality related is defined in the Unit 3 USFAR as a non-safety-related system, part of a SSC that performs a function which may have some significance to safety with respect to design criteria to which the quality assurance program must be applied as applicable. As described in Chapter 16 of the Unit 3 UFSAR, SW line 405 was designed as seismic Category I, since its failure could reduce the functioning of the RHR pumps due to unacceptable flooding in the PAB.

The inspectors independently reviewed the supporting documentation to determine whether re-classifying a portion of SW line 405 was reasonable. The inspectors determined there was no safety-related design function of this portion of SW line 405. However, the inspectors noted that line 405 was designed as seismic Category I and that modifications, including repairs, needed to be evaluated in accordance with the 10 CFR 50.59 process to ensure the design basis of the component was being maintained.

.4 Annual Sample: Independent Spent Fuel Storage Installation Loading Issues Corrective Actions

a. Inspection Scope

The inspectors performed an in-depth review of Entergy's apparent cause analysis and corrective actions associated with the licensee-identified violation against 10 CFR 72.150, "Instructions, Procedures and Drawings," described in Indian Point Integrated Inspection Reports 05000247/2017001, 05000286/2017001, and 07200051/2017001 (ADAMS Accession No. ML17131A128). Entergy documented the event in CR-IP2-2017-00356, which includes the apparent cause analysis. To accomplish the inspection objectives, the inspectors reviewed the revised operating procedures, the apparent cause analysis, and the associated corrective actions. The inspector observed 10 of 32 fuel movements from the spent fuel into multi-purpose canister (MPC) 439 on December 4, 2017, to evaluate the effectiveness of the implemented corrective actions.

The inspectors assessed Entergy's problem identification threshold, causal analyses, extent of condition reviews, and the prioritization and timeliness of Entergy's corrective actions to determine whether Entergy was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Entergy's CAP and 10 CFR Part 50, Appendix B, and assessed the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

On January 24, 2017, a fuel assembly was placed into the MPC 180 degrees from the intended location during an independent spent fuel storage installation campaign. The crew noted that the fuel assembly was not in the usual first position and stopped work. Entergy determined that the fuel map provided by reactor engineering did not agree with the fuel maps in the procedure. In addition, the fuel maps provided in the procedure were difficult to interpret. Entergy made revisions to the procedure to enhance the readability of the fuel maps and moved the fuel bundle to the correct placement before continuing with the rest of the fuel loading.

CR-IP2-2017-00356 directed an apparent cause analysis in which Entergy determined the direct cause of the fuel misplacement to be that the crew did not verify the fuel loading map provided by reactor engineering against procedure reference maps before beginning to load fuel into the MPC. Additional contributing causes were determined to be the lack of clarity and consistency between the fuel maps that reactor engineering and the operators were using. Also, the overall experience level of the crew was lowered by having to replace one of the fuel handlers with a qualified, but less experienced individual. Entergy's corrective actions included revising the applicable procedures to add clarity and consistency to the fuel maps and to add a step into the procedure instructing the crew to verify the fuel map before starting fuel moves. The inspectors determined that Entergy developed and implemented an appropriate plan to address the direct and contributing causes listed in CR-IP2-2017-00356.

During the fuel movement on December 4, 2017, the inspectors observed that the dry cask storage fuel handling supervisor verified that the fuel movement sheets obtained from reactor engineering addressed fuel movement for MPC 439 and the diagram for loading the fuel into the MPC was contained in the approved fuel handling procedure. The dry cask storage supervisor involved in the fuel movement had been briefed on the previous fuel movement error. Copies of the correct MPC diagram were posted at the spent fuel pool. Communications amongst the dry cask storage staff demonstrated good three-way communication; however, the inspector (listening on a set of head phones) noted that the sound quality was very poor. Licensing staff advised that they would review this concern.

The inspectors determined that Entergy's overall response to the misplacement of a fuel assembly on January 24, 2017, was commensurate with the safety significance, was timely, and included appropriate corrective actions. The inspectors determined that the actions taken were reasonable to resolve the issues.

4OA3 Follow Up of Events and Notices of Enforcement Discretion (71153 – 2 samples).1 Plant Eventa. Inspection Scope

For the plant event listed below, the inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant event to appropriate regional personnel and compared the event details with criteria contained in Inspection Manual Chapter 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that Entergy made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR 50.72 and 50.73. The inspectors reviewed Entergy's follow-up actions related to the event to assure that Entergy implemented appropriate corrective actions commensurate with their safety significance.

Unit 3

- Reactor trip on November 3, 2017, caused by a loss of excitation to the main generator

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000286/2017-001-00: Single Flow Barrier Access Point Found Unbolted

On May 14, 2017, in Mode 4, in preparation for reactor startup, Entergy was performing RHR system check valve testing in containment. Workers transiting the inner and outer crane wall sections of containment did not maintain flow channeling gate C secured during Mode 4 to ensure availability of the containment sumps to provide suction for the emergency core cooling system (ECCS). While inspecting the outer section of containment, the inspectors noted that gate C was closed but not secured. Upon questioning by the inspectors, Entergy immediately restored gate C to an acceptable configuration and verified all other gates were closed and secured. Entergy generated CR-IP3-2017-02737 to address this issue.

Entergy informed the entire site of the event and lessons learned. Locks will be installed for each unit by the end of the next respective refueling outages on the single access crane wall gates. Each unit will have a common key to be maintained by operations management.

A finding for this event was previously documented in the Indian Point Integrated Inspection Report 05000247/2017002 and 05000286/2017002 (ADAMS Accession No. ML17220A074) as 05000286/2017002-1, Failure to Maintain Flow Channeling Gate Closed in Accordance with the Containment Procedure.

The inspectors did not identify any new issues during the review of the LER. This LER is closed.

#### 4OA5 Other Activities

(Discussed) Violation 05000247/2016-003-07: Inadequate Control of Floor Drains to Minimize Groundwater Contamination (EA-16-193)

On February 16, 2017, Entergy replied to the Notice of Violation. The corrective actions completed by Entergy since August 2017 included installation of the backflow inhibitor valve at sump 28, installation of a permanent sealant in the fuel storage building subfloor, the inspections of the remaining floor drains in the radiological controlled area at Units 2 and 3 (excluding those in the containment), and cleaning/repair as appropriate. All corrective actions have been completed except that ten of the floor drains indicated on the plant drawings were determined not to exist. A CR documenting this non-conformance was not initiated by Entergy until prompted by the inspectors. Entergy has not established a due date to correct the plant drawings. Completed corrective actions have addressed the flow path issues between the reverse osmosis skid and the No. 21 waste hold-up tank which led to groundwater tritium contamination in January 2016.

#### 4OA6 Meetings, Including Exit

On February 1, 2018, the inspectors presented the inspection results to Mr. Anthony Vitale, Site Vice President, and other members of Entergy's staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

On February 13, 2018, the inspectors presented the inspection results of the semi-annual trend review regarding RPV O-ring failures to Mr. Robert Walpole, Manager, Regulatory Assurance, and other members of Entergy's staff.

### **ATTACHMENT: SUPPLEMENTARY INFORMATION**

## SUPPLEMENTARY INFORMATION

### KEY POINTS OF CONTACT

#### Entergy Personnel

##### Senior Managers

A. Vitale, Site Vice President  
J. Ferrick, General Manager, Plant Operations  
V. Andreozzi, Director, Engineering  
G. Bouderau, Senior Manager, Site Projects and Maintenance Services  
R. Burroni, Director, Special Projects  
M. Kempski, Senior Manager, Maintenance  
M. Lewis, Senior Manager, Operations  
B. McCarthy, Director, Regulatory Assurance and Performance Improvement  
M. Zeoli, Senior Manager, Production

##### Other Personnel

R. Anderson, Superintendent, Instrumentation and Control  
N. Azevedo, Supervisor, Engineering  
E. Bauer, Design Engineer  
S. Bianco, Fire Marshall  
C. Bohren, Unit 2 Shift Manager  
G. Bubniak, Senior Engineer  
D. Celentano, Licensed Training Instructor  
C. Chapin, Manager, Training  
G. Dahl, Regulatory Assurance  
J. D'Antono, Maintenance Rule Coordinator  
C. Delamater, Emergency Planner  
J. Donlan, Radiation Protection Technician  
K. Elliot, Fire Protection Engineer  
J. Hidalgo, Senior Nuclear Fuel Handler  
M. Johnson, Manager, Assistant Operations  
R. Jones, Fuel Handler  
C. Karsten, Senior Emergency Planner  
N. Lizzo, Quality Assurance Auditor  
A. LoPiccolo, Engineer, Nuclear  
W. Lucas, Unit 2 Reactor Operator  
C. Mackaman, Nuclear Safety/License Specialist  
S. Malinski, Design Engineer  
T. McKee, Unit 3 Program Administrator  
B. Miller, Engineer, Nuclear  
M. Mirzai, Nuclear Safety/License Specialist IV  
F. Mitchell, Manager, Emergency Preparedness  
D. Morse, Engineer  
T. Murphy, Shift Manager  
M. Olfati, FME Monitor  
C. Patterson, Superintendent, Dry Cask Storage  
D. Pennino, Systems Engineer  
C. Porter, Fuel Technician

D. Powell, Supervisor, Control Room  
 E. Primrose, Unit 2 Shift Manager  
 J. Quillen, Licensed Training Instructor  
 P. Santini, OCC OPS Coordinator, SRO  
 C. Socz, Nuclear Independent Oversight  
 S. Stevens, Manager, Radiation Protection  
 B. Sullivan, Licensed Operator Requalification Coordinator  
 M. Troy, Manager, Performance Improvement  
 B. Vangor, Supervisor, Dry Cask  
 R. Walpole, Manager, Regulatory Assurance  
 W. Wittich, Supervisor, Engineering  
 A. Zastrow, Shift Manager, Training

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

Opened

05000286/2017-004-01	URI	Adequacy of Entergy’s Modification to Meet Seismic Category I Design Requirements (Section 1R18)
05000247/2017-004-02	URI	Unidentified Reactor Pressure Vessel O-Ring Leakage Caused Degraded Studs (Section 4OA2)

Closed

05000286/2017-001-00	LER	Single Flow Barrier Access Point Found Unbolted (Section 4OA3)
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Discussed

05000247/2016-003-07	VIO	Inadequate Control of Floor Drains to Minimize Groundwater Contamination (Section 4OA5)
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**LIST OF DOCUMENTS REVIEWED**

**Common Documents Used**

Indian Point Units 2 and 3, UFSAR  
 Indian Point Units 2 and 3, Individual Plant Examination  
 Indian Point Units 2 and 3, Individual Plant Examination of External Events  
 Indian Point Units 2 and 3, TSs and Bases  
 Indian Point Units 2 and 3, Technical Requirements Manual  
 Indian Point Units 2 and 3, Control Room Narrative Logs  
 Indian Point Units 2 and 3, Plan of the Day



## **Section 1R01: Adverse Weather Protection**

### Procedures

0-CY-1810, Diesel Fuel Oil Monitoring, Revision 18  
2-AOP-FLOOD-1, Flooding, Revision 11  
3-AOP-FLOOD-1, Flooding, Revision 10

OAP-008, Severe Weather Preparations, Revision 24  
OAP-048, Seasonal Weather Preparation, Revision 19

### Miscellaneous

2-RND-NUC, Unit 2 Nuclear Rounds, retrieved November 30, 2017  
3-RND-NUC, Unit 3 Nuclear Rounds, retrieved November 30, 2017  
Procurement Engineering Technical Evaluation 04-001504, Open Market Generic (00226)  
Diesel Fuel Oil, Revision 1

### Calculations

IP-CALC-13-00057, FLEX Event Diesel Fuel Usages – Unit 3, Revision 4  
IP-CALC-14-00037, FLEX Event Diesel Fuel Usages – Unit 2, Revision 4

## **Section 1R04: Equipment Alignment**

### Procedures

2-AOP-SF-1, Loss of Spent Fuel Pit Cooling, Revision 6  
2-COL-4.2.1, RHR System, Revision 30  
2-COL-4.3.1, Spent Fuel Pit Cooling, Revision 10  
2-POP-4.1, Operation at Cold Shutdown, Revision 7  
2-POP-4.2, Operation Below 20 Percent Pressurizer Level with Fuel in the Reactor/Refueling,  
Revision 10  
2-SOP-4.2.1, RHR System Operation, Revision 67  
3-COL-CS-001, Containment Spray System, Revision 15  
3-COL-FW-2, Auxiliary Feedwater System, Revision 33

### Condition Reports (CR-IP2-)

2016-03982 2016-04160

### Drawings

209762, Flow Diagram SW System Nuclear Steam Supply Plant, Sheet 2 of 2, UFSAR  
Figure No. 9.6-1 (Sheet 2), Revision 77  
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\*Denotes results from NRC inspection

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3-AOP-RLR-1, Rapid Load Reduction, Revision 2  
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3-POP-1.2, Reactor Startup, Revision 55  
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\*Denotes results from NRC inspection

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 EN-DC-203, Maintenance Rule Program, Revision 4  
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 3-PT-A052, LI-6500 A/B, Spent Fuel Pool Level Instrument Channel Check/Panel Functional Check, Revision 0  
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0-GNR-404-ELC, EDG Two-Year Inspection, Revision 18  
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2-PT-Q026B, 22 SW Pump, Revision 22  
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2-PT-Y045B, 22 SW Pump Full Flow Test, Revision 4  
2-SOP-1.3, Reactor Coolant Pump Startup and Shutdown, Revision 46  
2-SOP-27.1.5, 480V System, Revision 53  
3-PT-Q088, Component Cooling Pumps, Revision 22

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 2-SOP-1.2, Draining RCS, Revision 50  
 2-SOP-4.2.1, RHR System Operation, Revision 67  
 3-GRN-042-MTG, Main Generator Exciter Disassembly, Inspection, Repair, and Reassembly  
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2-PT-Q034A, 22 Auxiliary Feed Pump Steam Supply Valves, Revision 11  
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2-PT-Y045B, 22 SW Pump Full Flow Test, Revision 4  
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EN-LI-114, NRC Performance Indicator Process, Revision 9

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**LIST OF ACRONYMS**

10 CFR # (x)(n)(y)(i)	Title 10 of the <i>Code of Federal Regulations</i> , Part #, Subpart (x)(n)(y)(i)
ASME	American Society of Mechanical Engineers
CAP	corrective action program
CCW	component cooling water
CFRP	carbon fiber reinforced polymer
CR	condition report
EAL	emergency action level
EDG	emergency diesel generator
JPM	job performance measure
LER	licensee event report
MBFP	main boiler feed pump
MPC	multi-purpose canister
NRC	Nuclear Regulatory Commission, U.S.
PAB	primary auxiliary building
PFP	pre-fire plan
RCS	reactor coolant system
RHR	residual heat removal
RPV	reactor pressure vessel
SSC	structure, system, and component
SW	service water
TCV	temperature control valve
TS	technical specification
UFSAR	updated final safety evaluation report
URI	unresolved item
WO	work order