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

November 5, 2015

Mr. Larry Coyle
Site Vice President
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING – INTEGRATED INSPECTION REPORT 05000247/2015003 AND 05000286/2015003

Dear Mr. Coyle:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Indian Point Nuclear Generating (Indian Point), Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on October 14, 2015, with Mr. John Dinelli, General Manager Plant Operations, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents three NRC-identified findings, all of which were of very low safety significance (Green). Two of these findings were determined to involve violations of NRC requirements. Additionally, two licensee-identified violations, which were determined to be of very low safety significance, are listed in this report. However, because of the very low safety significance, and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations, consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest any non-cited violation in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Indian Point. In addition, if you disagree with the cross-cutting aspect assigned to any finding, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Senior Resident Inspector at Indian Point.

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

Sincerely,

/RA/

Arthur L. Burritt, 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 05000247/2015003 and 05000286/2015003
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

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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.	05000247/2015003 and 05000286/2015003
Licensee:	Entergy Nuclear Northeast (Entergy)
Facility:	Indian Point Nuclear Generating Units 2 and 3
Location:	450 Broadway, GSB Buchanan, NY 10511-0249
Dates:	July 1, 2015, to September 30, 2015
Inspectors:	J. Stewart, Senior Resident Inspector G. Newman, Acting Senior Resident Inspector S. Rich, Resident Inspector A. Bolger, Acting Resident Inspector B. Pinson, Acting Resident Inspector S. Barr, Senior Emergency Preparedness Specialist J. Furia, Senior Health Physicist H. Gray, Senior Reactor Inspector O. Masnyk-Bailey, Health Physicist
Approved By:	Arthur L. Burritt, Chief Reactor Projects Branch 2 Division of Reactor Projects

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SUMMARY

Inspection Report 05000247/2015003, 05000286/2015003; 07/01/2015 – 09/30/2015; Indian Point Nuclear Generating (Indian Point), Units 2 and 3; Flood Protection Measures, Operability Evaluations, and Identification and Resolution of Problems.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The inspectors identified three findings of very low safety significance (Green), which were non-cited violations (NCVs). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green finding (FIN) because Entergy allowed the Unit 3 480 volt switchgear room floor drains to become blocked such that they could not mitigate an internal flood postulated in Action and Condition Tracking Form 95-14218. Specifically, if both service water (SW) relief valves in the 480 volt switchgear room lifted, their flow rate would be greater than the as-found drain flow rate. This finding does not involve enforcement action because no violation of regulatory requirement was identified.

  This finding was more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone, and adversely affected the cornerstone objective to ensure the capability of systems to respond to initiating events to prevent undesirable consequences. Specifically, the Unit 3 480 volt switchgear room floor drains were not capable of mitigating an internal flood hazard to prevent damage to the 480 volt switchgear, potentially resulting in core damage. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 4, "External Events Screening Questions," of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined this finding required a detailed risk assessment. A detailed risk assessment was conducted using the Unit 3 SDP External Event Notebook, which determined that there was a change in core damage frequency of low E-8 per reactor year (an increase in 1 in 100 million reactor years). Therefore, this performance deficiency was of very low safety significance (Green). The inspectors determined the finding does not have a cross-cutting aspect. Although Entergy did not thoroughly evaluate the Unit 2 blocked floor drain issue in 2011 to ensure the resolution addressed extent of condition, Entergy has improved their extent of condition evaluation guidance since 2012. (Section 1R06)

Cornerstone: Barrier Integrity

- Green. The inspectors identified a Green NCV for Unit 2 Technical Specification (TS) 3.6.1, "Containment," because between August 11 and August 14, 2015, containment out-leakage during accident conditions would have exceeded the containment leakage rate testing

program limit specified in TS 5.5.14.c. Specifically, the 24 fan cooler unit (FCU) SW piping developed a hole and Entergy's immediate operability determination (IOD) incorrectly concluded that it did not impact operability. Entergy entered this issue into their corrective action program (CAP) as CR-IP2-2015-3550, completed a prompt operability determination (POD) that required compensatory measures, and implemented those compensatory measures on August 14, 2015.

This finding is more than minor because it was associated with the configuration control attribute of the Barrier Integrity cornerstone, and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers, such as containment, protect the public from radionuclide releases caused by accidents or events. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 3 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green), because it did not represent an actual open pathway in the physical integrity of reactor containment or heat removal components. For the duration of the violation, SW system pressure remained higher than containment pressure, preventing out-leakage. This finding had a cross-cutting aspect in the area of Human Performance, Conservative Bias, because Entergy did not demonstrate a conservative bias when they assumed the opening in the pipe was too small to impact containment integrity [H.14]. (Section 1R15)

Cornerstone: Occupational/Public Radiation Safety

- Green. The inspectors identified a Green NCV of Title 10 of the *Code of Federal Regulations* (10 CFR) 20.1406(c) in that Entergy did not conduct operations to minimize the introduction of residual radioactivity into the site. Specifically, Entergy did not identify a new leak of tritium into groundwater based on monitoring well results obtained in February 2015 and did not take action to minimize the introduction of residual radioactivity into the subsurface of the site. Entergy entered this issue into their CAP as CR-IP2-2015-03806 with actions to characterize and evaluate this new leak.

  The issue is more than minor because it is associated with the program and process attribute of the Public Radiation Safety cornerstone, and adversely affected the cornerstone objective to ensure Entergy's ability to prevent inadvertent release and/or loss of control of licensed material to an unrestricted area. In accordance with IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance (Green) because the issue involved radioactive material control but did not involve: (1) transportation or (2) public exposure in excess of 0.005 rem.

  The finding had a cross-cutting aspect in the area of Human Performance, Problem Identification and Resolution, in that the resolutions to address the causes for the 2014 tritium leak did not include an extent of condition that recognized the February 2015 tritium spike as a new leak [P.2]. (Section 4OA2)

Other Findings

Two violations of very low safety significance that were identified by Entergy were reviewed by the inspectors. Corrective actions taken or planned by Entergy have been entered into Entergy's CAP. The violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 2 operated at 100 percent power during the inspection period.

Unit 3 operated at 100 percent power during the inspection period with the following exceptions: Unit 3 was manually tripped from full power on July 8, 2015, as result of a feedwater transient. The unit was restarted on July 9, 2015, and operated at reduced power while repairs were made to secondary components. Unit 3 returned to full power operations on July 11, 2015. On September 15, 2015, Unit 3 was shut down for a planned maintenance outage to replace the reactor vessel O-rings. Following maintenance activities, the reactor was critical on September 25, 2015, and returned to power operation on September 26, 2015.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed Entergy's preparations for the onset of hot weather on July 21, 2015. The inspectors reviewed the implementation of adverse weather preparation procedures including OAP-48, "Seasonal Weather Preparation (Units 2 and 3)," and 2-SOP-24.1.1, "Service Water Hot Weather Operations (Units 2)," before the onset of and during this adverse weather condition. The inspectors walked down the Unit 2 and Unit 3 main control rooms and 480 volt switchgear rooms to ensure system availability and that there were no problems as a result of the severe weather. The inspectors verified that operator actions defined in Entergy's adverse weather procedure maintained the readiness of essential systems. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems

a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems for seasonal high grid loading. The inspectors reviewed Entergy's procedures affecting these areas and the communications protocols between the transmission system operator and Entergy. This review focused on the material condition of the offsite and alternate AC power equipment. There were no changes to

the established program since the last inspection. The inspectors assessed whether Entergy established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system engineer and the switchyard coordinator, reviewing condition reports (CRs) and open work orders (WOs), and walking down portions of the offsite and AC power systems including the 345 kilovolt (kV), 138 kV, and 13.8 kV switchyards.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

Unit 2

- Emergency diesel generators (EDGs) on July 7, 2015, with 13.8 kV electrical distribution out of service
- 22 and 23 auxiliary boiler feedwater pumps (ABFPs) on July 20, 2015, with 21 ABFP out of service for planned maintenance [this sample was part of an in-depth review of the auxiliary feedwater (AFW) system]

Unit 3

- Containment spray on July 17 and 20, 2015, following system testing

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 Updated Final Safety Analysis Report (UFSAR), TSs, WOs, 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 September 9, 19, and 22, 2015, the inspectors performed a complete system walkdown of accessible portions of the Unit 3 residual heat removal system to verify existing equipment lineup was correct. The walkdown included the portion of the system inside the vapor containment (VC) while the residual heat removal system was in service with the reactor vessel disassembled. 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 confirmed that systems and components were aligned correctly, free from interference from temporary services or isolation boundaries, environmentally qualified, and protected from external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of CRs related to equipment alignment to ensure Entergy appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (71111.05Q – 5 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 was available for use as specified in the area pre-fire plan (PFP), and 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

- Turbine building general areas (PFP-255, PFP-256, and PFP-257 were reviewed) on July 6, 2015
- Diesel generator building (PFP-258 was reviewed) on August 21, 2015
- Component cooling pump room (PFP-209 was reviewed) on August 27, 2015

Unit 3

- Cable spreading room (PFP-352 was reviewed) on July 8, 2015
- Charging pump room (PFP-307B was reviewed) on September 30, 2015

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 2 samples)

Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the CAP to determine if Entergy identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. In particular, the inspectors focused on the areas listed below to verify the adequacy of door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers, as applicable.

- Unit 3 diesel SW valve room and associated sump
- Unit 3 480 volt switchgear room

b. Findings

Introduction. The inspectors identified a finding of very low safety significance (Green) because Entergy allowed the Unit 3 480 volt switchgear room floor drains to become blocked such that they could not mitigate an internal flood postulated in Action and Condition Tracking Form 95-14218. Specifically, if both SW relief valves in the 480 volt switchgear room lifted, their flow rate would be greater than the as-found drain flow rate.

Description. On May 9, 2015, during a transformer fire at Unit 3, Entergy noted water on the floor of the Unit 3 480 volt switchgear room. The source of the water was the transformer deluge system valves (see NRC Inspection Report 05000286/2015010). The water accumulated on the floor of the room, despite three floor drains located in the 480 volt switchgear room. Entergy performed a boroscopic inspection of the floor drain piping and discovered restrictions in the piping caused by debris. Entergy also performed flow tests and determined that the combined floor drains could pass a maximum of 25 gallons-per-minute (gpm) in their clogged state.

The inspectors reviewed the existing preventive maintenance (PM) program for the Unit 3 480 volt switchgear room drains, which included a periodic “flush” of the floor drains. The flush involved Entergy pouring 10 gallons of water on to the drain and verifying it drained away in less than a minute. The inspectors noted that this approach was not capable of verifying the floor drains were clear of restrictions because the 10 gallons could easily be absorbed in the volume of piping below the floor (and therefore

out of sight) without actually draining past the restrictions found during the boroscopic inspection. Because there is no design-basis requirement for the drains to function, Entergy considered this an adequate flush.

The inspectors noted a placard was posted on the wall in the 480 volt switchgear room stating, “Warning – do not block drains – SER 8-95/ACT-95-14218”. Action and Condition Tracking Form 95-14218 was written to document an operating experience event from another site that had a flood in their switchgear room after a valve was inadvertently left open. New York Power Authority, then-owner of Unit 3, identified that the Unit 3 480 volt switchgear room contained sources of water that could cause internal flooding and evaluated each one in ACT 95-14218. The largest water source was two relief valves located on SW piping in the room, which would flow 58 gpm into the room if both valves lifted under their design pressures. New York Power Authority concluded that the relief valves did not pose an internal flooding concern because the floor drains in the room could drain up to 99 gpm.

Entergy had previously reviewed the adequacy of the floor drain PM as part of an extent of condition evaluation in response to water accumulation in the Unit 2 switchgear room during Tropical Storm Irene in August 2011 (see NRC Inspection Report 05000247/2012002). In that evaluation, Entergy noted that blockage of the floor drains in the Unit 3 480 volt switchgear room could potentially impact equipment in the room but concluded that the floor drains were not credited to mitigate flooding in the room. Therefore they did not change their practice of a once per cycle flush of the floor drains. Since then, Entergy has revised their causal evaluation procedure, and added rigor to the extent of condition evaluation process.

Entergy entered the floor drain blockage into their CAP as CR-IP3-2015-3121. That CR was closed to a previous CR on the water accumulation, CR-IP3-2015-2921, and the corrective actions for that CR included cleaning the drains, verifying they could drain approximately 100 gpm, and revising the periodic maintenance activity to require a 25 gpm flush for five minutes for each drain.

Analysis. The inspectors determined that failing to maintain the ability of Unit 3 480 volt switchgear room drains to accommodate the postulated internal flood event from two lifted SW relief valves, as documented in ACT-95-14218, was a performance deficiency that was within Entergy’s ability to foresee and correct. This performance deficiency was more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone, and adversely affected the cornerstone objective to ensure the capability of systems to respond to initiating events to prevent undesirable consequences. Specifically, the Unit 3 480 volt switchgear room floor drains were not capable of mitigating an internal flood hazard to prevent damage to the 480 volt switchgear, potentially resulting in core damage. In accordance with IMC 0609.04, “Initial Characterization of Findings,” and Exhibit 4, “External Events Screening Questions,” of IMC 0609, Appendix A, “The Significance Determination Process for Findings At-Power,” issued June 19, 2012, the inspectors determined this finding required a detailed risk assessment. A detailed risk assessment was conducted using the Unit 3 SDP External Event Notebook. The modeling of the condition is represented in Table 4.3.2 for Flood Scenario B. A revised initiating event frequency was developed

to represent the performance deficiency. This revised frequency was developed based on the following considerations:

- It was assumed that on the restoration of SW, following a loss of off-site power or a loss of SW, there was a one in ten probability that conditions could be present to challenge the SW relief valves.
- The failure of a safety to close was obtained from NUREG/CR-6928 table A.2.45.4.
- No flooding recovery is assumed.

This results a conditional switchgear flooding initiating event frequency of approximately 2E-7. Applying this to the Unit 3 SDP External Event Notebook, Table 4.3.2 for Flood Scenario B, resulted in a change in core damage frequency of low E-8 per reactor year (an increase in 1 in 100 million reactor years). Therefore, this performance deficiency was of very low safety significance (Green). The dominant conditions were flooding with reactor coolant pump seal failures and flooding with a failure of the turbine driven AFW pump.

The inspectors determined the finding does not have a cross-cutting aspect. Although Entergy did not thoroughly evaluate the Unit 2 blocked floor drain issue in 2011 to ensure the resolution addressed extent of condition, Entergy has improved their extent of condition evaluation guidance since 2012.

Enforcement. This finding does not involve enforcement action because no violation of regulatory requirement was identified. Specifically, Entergy chose to use the Unit 3 480 volt switchgear room floor drains to address a potential internal flooding event, but that function is not a part of their licensing basis. Because this issue does not involve a violation of regulatory requirements and has very low safety significance, it is identified as a finding. Entergy's corrective actions included cleaning the drains and revising the PM activity to include a 25 gpm flush for five minutes. (**FIN 05000286/2015003-01, Blocked Drains in the 480 Volt Switchgear Room)**

1R07 Heat Sink Performance

Triennial Heat Sink Performance (71111.07T – 4 samples)

a. Inspection Scope

The inspectors reviewed previous heat sink inspection results, a listing of safety-related and risk-significant heat exchangers (HXs), and Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment," to select components for this heat sink inspection. Components having high risk or safety importance were given preference, along with components that had no NRC inspection history within the last five years. The location of the components within the facility, function, operating history, and potential for degradation were considered. From these criteria, the inspectors selected the following areas for review:

- 25 containment recirculation fan cooling coils
- 25 containment recirculation motor cooling coils
- 33 EDG jacket water (JW) cooler

- 33 EDG lube oil (LO) cooler
- 35 containment recirculation fan main cooling coils
- Operation and performance of the SW and component cooling water (CCW) systems for Units 2 and 3, including leakage monitoring, piping integrity, motor operability, and intake structure functionality
- 22 CCW HX

For these samples, the inspectors reviewed the methods used to ensure continued heat removal capabilities of HXs (i.e., performance testing and monitoring, PM, inservice inspection (ISI), and problem identification and resolution). The inspectors also reviewed related system health reports and Entergy self-assessments. The inspectors considered potential HX deficiencies and common cause heat sink performance problems that have the potential to increase risk and determined if Entergy had adequately identified and resolved risk-significant heat sink performance problems.

Service Water Cooled Heat Exchangers

The inspectors reviewed documents, databases, procedures, and processes to determine the overall operability and condition of the SW systems in Units 2 and 3.

The inspectors reviewed monthly flow tests for the 25 fan cooler motor unit and verified flow rates met the TS requirements. The inspectors determined that Entergy performed required tests, adjustments, and rebalances to maintain the flow rates in accordance with the TS values. During inservice performance testing of the 25 fan cooler motor unit, Entergy considered the differences between testing conditions and design conditions, taking into account instrument inaccuracies.

The inspectors reviewed periodic flow testing results, sampled monthly, for Unit 3 31 through 35 fan cooler motor units and observed a decreasing trend last year towards the TS limit. When tested in March 2015, in the as-found condition of 31, 32, and 33 fan cooler motor units were operating at a lower flow rate than allowed in the TS. Subsequently, Entergy submitted licensee event report (LER) 05000286/2015-003-00 to the NRC and performed cleaning and rebalancing of the system to restore flow rates above the limit.

The inspectors reviewed the process for control of biofouling and micro-fouling. Entergy uses chlorination, along with monitoring of settlement plates and bioboxes, to monitor for marine life and take action to ensure marine life did not affect HX functionality. No bivalve species were present for the first two quarters of 2015; and the HXs, when opened and inspected, were generally clean and did not have marine life present.

In addition to chlorinating the intake water, Entergy's chemistry department measured water temperature, the concentration of the chlorine, and tracked the effects of chlorination on the HXs and other system components. The inspectors concluded that Entergy had an effective protection system against the intrusion of marine life into the SW system. Entergy's biocide treatment program was consistent with industry standards, established acceptance criteria, and was sufficiently controlled, tested, and evaluated. Entergy's biocide treatment program was monitored at an appropriate

frequency to have degradation from marine intrusion detected prior to loss of heat removal capabilities to below design basis values.

The inspectors performed a walk down of the Unit 2 and Unit 3 SW intake buildings, structures, and components, including those that were selected for inspection. The inspectors verified that silt removal from around the pumps in the SW intake structure was monitored and that Entergy periodically tracks, reports, and removes sediment buildup using ultrasonic technology and a diving team.

The inspectors reviewed information regarding the Unit 3 EDG JW and LO HXs. The inspectors verified that the EDG JW and LO HXs in Unit 3 have not exceeded the maximum allowable number of tubes plugged. The inspectors confirmed Entergy performed periodic PM checks intended to ensure degradation of the EDG HXs was detected prior to having decreased heat removal capabilities the required capability.

Entergy performed HX calculations on the EDGs as consistent with industry standards to identify and monitor fouling factor changes, but concluded results were indeterminate due to test instrument inaccuracies and limited differences of fouling factor calculation input variables. Rather than performing a fouling factor analysis, the inspectors observed that Entergy implemented open and inspect activities of safety-related HXs on a fixed basis, with a frequency that was sufficient to detect degradation prior to loss of heat removal capabilities below design basis values. The inspectors concluded that Entergy's frequency of opening and inspecting HXs was consistent with industry standards. The timing of the inspections and cleaning of the HXs was consistent with previous as-found conditions and identified adverse trends.

Component Cooling Water System Heat Exchangers (Units 2 and 3)

Inspection of the CCW systems included a walk down of selected components and review of programs and procedures for maintaining CCW safety functions. The inservice test results for the flow and pressure of the 21 CCW pump and the 32 CCW pump from the last four years were reviewed for comparison to the design basis limits.

In addition, the inspectors completed a walk down of the CCW HXs and associated components. The inspectors observed flow-induced vibration with movement of 21 CCW HX and brought this to Entergy's attention. Entergy initiated CR-IP2-2015-02913 for 21 CCW HX and provided an explanation for the vibration, along with calculations addressing deadweight and seismic loading. Entergy provided information to show that the current conditions of the 21 CCW HX was acceptable and would not damage components near the piping or degrade the integrity of the piping itself. Entergy provided an action plan as part of the CR to resolve the issue.

Additional Inspected Areas (Units 2 and 3)

The inspectors reviewed Entergy's HX eddy current program and verified it was based on Electric Power Research Institute (EPRI) guidelines for HX tube assessment, past operating experience, safety significance, current operating conditions, and NRC guidelines including GL 89-13. The inspectors found the program had a consistent

approach to inspecting, testing, and maintaining HXs. These methods were in accordance with industry standards. Tube plugging criteria and HX replacement criteria were reviewed.

The inspectors reviewed Entergy's database for Units 2 and 3 HXs, their physical characteristics, criteria for eddy current testing, and past eddy current test results, noting that the number of tubes plugged did not exceed the limits in procedure SEP-HX-IP-001, "IPEC Heat Exchanger / Eddy Current Program," Revision 1.

The cleaning and servicing of the 22 condensate vacuum pump HX was observed as work in progress, providing confirmation of the quality level on the SW side of that HX. The inspectors examined results of eddy current testing of this HX and the visual inspection reports. This work was reviewed to obtain an overall sense for Entergy's eddy current testing program and to determine the structural integrity of the HX tubes.

The inspectors examined Entergy's program for selecting safety-related HXs in the plant for the NRC GL 89-13 SW program inspection scope. Entergy's implementation was compared to GL 89-13 guidelines as part of the process to maintain the capability of the ultimate heat sink.

The inspectors verified that the PM program for Units 2 and 3 took into account previous as-found conditions and addressed possible degradation of HXs and related components. The inspectors confirmed that each HX cooled by SW has a component-specific maintenance procedure, which was used for the associated PM and inspection tasks. The inspectors confirmed that each GL 89-13 HX scheduled for PM in the last year was opened, inspected, and cleaned.

Entergy also performed PM task for HXs cooled by a closed loop CCW. The inspectors verified that Entergy performed visual and eddy current inspections as deemed appropriate for each HX.

The inspectors concluded the frequency of the PM tasks performed on the SW and CCW HXs were satisfactory to prevent substantial degradation. Between the two PM programs for the SW and CCW HXs, the inspectors concluded Entergy adequately allowed for the surveillance of safety-related HXs to maintain heat removal capabilities greater than design basis values.

For Inspection Procedure 71111.07 attribute 02.02.b.4, in accordance with NRC GL 96-06, "Assurance of Equipment Operability and Containment Integrity during Design-Basis Accident Conditions," the inspectors verified that Entergy had evaluated the potential for water hammer in susceptible HXs through in-plant testing and structural analysis and concluded water hammer is not a significant problem.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08P – 1 sample)

a. Inspection Scope

The inspectors conducted an inspection of Entergy's implementation of their ISI activities related to leakage past the Unit 3 reactor vessel head to shell flange pressure boundary O-ring seals. The inspection scope included review of Entergy's engineering evaluation (EC59564) completed prior to Unit 3 shutdown, followed by onsite inspections from September 17–21, 2015, to observe boric acid control activities, examination and assessment of the flanges and bolts, and actions to identify possible causes of the leakage and take corrective action prior to plant restart. The inspectors also observed portions of the O-ring replacement process during the Unit 3 outage (3PO-15E).

The inspectors observed Entergy activities to identify and evaluate the effects of reactor coolant leakage past the reactor pressure vessel (RPV) head O-rings. The inspectors observed or reviewed video of the as-found and as-left conditions of the RPV head, RPV vessel shell flanges, and pressure boundary studs. The inspectors observed the boric acid leakage identification process and portions of the residual boric acid removal process to determine whether these activities were implemented in accordance with Entergy boric acid control and CAPs.

The inspectors observed in-process non-destructive examinations (NDE) of the RPV flange and studs, reviewed work control activities, and records for the O-ring replacements, and interviewed Entergy to verify that the NDE activities performed as part of the fourth interval, Unit 3 ISI program, were conducted in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PV), Section XI, 2001 Edition, 2003 Addenda. Specifically visual examination to Section XI, IWA -5250, was applied to vessel studs contacted by boric acid and a close up visual examination was performed to the VT-1 standards of studs number 5 and number 6 to confirm all studs were acceptable for continued service.

ASME Code Required and Related Examinations (Section 02.01)

The inspectors selected the following examinations for review to determine whether the ASME B&PV code requirements were met:

- As-found visual examination of RPV head inner and outer O-rings, RPV head O-ring channels, and RPV flange O-ring seating surfaces
- Cleaning and visual inspection of 20 reactor vessel head studs which were in the vicinity of the reactor coolant leakage path
- Verification that NDE examinations were performed in accordance with ASME Section XI procedures by qualified NDE examiners and the results were reviewed and evaluated by certified ASME Level III personnel

Identification and Resolution of Problems (IP Section 02.05)

The inspectors verified that ISI related problems and nonconforming conditions were properly identified, characterized, and evaluated for disposition within Entergy's CAP.

The inspectors reviewed the Critical Decision Document dated September 21, 2015, that provided the details of the as-found conditions and the basis for corrective actions during O-ring replacement.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11Q – 5 samples)

Unit 2

.1 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed control room activities during entry into TS limiting condition for operation (LCO) 3.0.3 for both trains of the residual heat removal system being declared inoperable due to unqualified fuses on MOV-746 and MOV-747 on August 18, 2015. The inspectors observed the crew briefings and testing activities to verify that the briefings met the criteria specified in Entergy's administrative procedure EN-OP-115, "Conduct of Operations." The inspectors verified that procedure use, crew communications, and coordination of activities similarly met established expectations and standards.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on July 12, 2015, which included a main steam break with main steam isolation valves failing to close, concurrent with an anticipated transient without scram. 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.

.3 Quarterly Review of Licensed Operator Requalification Testing and Training (Annual Requalification Operating Test)

a. Inspection Scope

The inspectors observed a crew composed of licensed operators in an evaluated simulator session on September 9, 2015. The session was part of the annual operating test required by 10 CFR 55.59. The evaluated scenario included a SW pump trip, a volume control tank level transmitter failure, and a loss of all AC power. 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 crew communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisors. The inspectors verified the timeliness of the emergency classification made by the shift manager. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems. The inspectors verified that Entergy evaluated the performance of the operating crew against pre-established criteria, including completion of critical tasks. Simulator fidelity was evaluated by comparison with routine control room observations.

b. Findings

No findings were identified.

Unit 3

.4 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed control room activities during an unplanned short duration outage that began with a manual reactor trip on July 8, 2015. On July 9, 2015, the inspectors observed the pre-evolution briefings, shift briefings, and reactivity startup activities to verify that the activities were conducted safely and met the criteria specified in Entergy's administrative procedure EN-OP-115, "Conduct of Operations." The inspectors observed the reactor restart and return to power operation to verify that procedure use, crew communications, and coordination of activities similarly met established expectations and standards. Entergy management presence in the control room and their observations of the evolution were noted by the inspectors.

b. Findings

No findings were identified.

.5 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on July 27, 2015, which included a steam generator tube rupture followed by a fault in the same steam generator. 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. 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.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component (SSC) performance and reliability. The inspectors reviewed system health reports, 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 10 CFR 50.65 and verified that the (a)(2) performance criteria established by Entergy was reasonable. Additionally, the inspectors ensured that Entergy was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

Unit 2 and Unit 3

The inspectors reviewed Entergy's Maintenance Rule (a)(3) Assessment documented in Learning Organization Condition Report LO-IP3LO-2015-00072. 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 PM activities. The inspectors verified that operating experience has been taken into account where practicable and that the licensee 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.

Unit 2

The inspectors reviewed the maintenance effectiveness of the AFW system as part of an in-depth review of the AFW system. The inspectors verified that system deficiencies had been appropriately screened for maintenance preventable functional failures, and that system unavailability had been correctly calculated. The inspectors also ensured that no repeat functional failures had occurred on the AFW system.

Unit 3

The inspectors reviewed the failure of the 31 main transformer and performed a system review to ensure the effectiveness of maintenance activities. The inspectors reviewed past planned and corrective maintenance on the 31 main transformer, to verify it had been performed in accordance with work instructions.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 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

- Elevated risk for safety injection logic testing and planned maintenance on 23 charging pump on July 6, 2015
- Elevated risk for planned maintenance and testing of 21 AFW pump and motor during which flow control valve FCV-1121 failed a stroke test (CR-IP2-2015-3098) on July 20, 2015 (this sample was part of an in-depth review of the AFW system)
- Elevated risk for 22 EDG planned maintenance and reactor coolant system (RCS) loop 1 hot leg temperature indicator TI-5139 inoperable on August 3, 2015

Unit 3

- Elevated risk for Tan-Delta testing of the Appendix R diesel bus when severe weather threatened the site on July 15, 2015. The 480 volt switchgear room and the EDGs were walked as part of the inspection sample.
- Elevated risk for PM on the Appendix R diesel generator (DG) and the 31 ABFP on August 25, 2015. The other ABFPs, the EDGs, and the Unit 2 Appendix R DG were walked down as part of the inspection sample.
- Elevated risk due to lowered inventory during the scheduled outage to replace the reactor vessel head O-rings from September 18 to 22, 2015.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 7 samples)

a. Inspection Scope

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

Unit 2

- On June 26, 2015, the 95-foot personnel airlock seal pressure switch failed (CR-IP2-20152754). The inspectors verified that the remaining airlock seals and containment integrity remained operable during corrective maintenance.
- On July 14, 2015, the NRC identified 22 AFW turbine outboard bearing oil below scribe mark (CR-IP2-2015-2995). The inspectors verified that adequate oil remained for the governor to complete its mission time.
- On August 11, 2015, Entergy identified a small leak on the SW piping associated with FCU 24 in the VC (CR-IP2-2015-3550). The inspectors evaluated the impact to containment integrity.
- On September 14, 2015, Entergy identified a small streaming leak on SW line 1704 for the instrument air closed cooling water HX (CR-IP2-2015-4170). The inspectors verified that the leak did not challenge system function and that the piping maintained structural integrity.

Unit 3

- On July 6, 2015, the inspectors reviewed the operability of the SW essential header following realignment (opening) of flow control valves FCV-1176 and FCV-1176A (CR-IP3-2015-2448).
- On July 10, 2015, Entergy identified that line 10 downstream of AC-732 contained a gas void measuring 10 inches (CR-IP3-2015-3827). The inspectors verified that the evaluated void size would not prevent the residual heat removal system from performing its safety function.
- On July 14, 2015, Entergy identified that the reactor vessel flange outer seal had leaked causing high temperature in the seal leakoff line in containment

(CR-IP3-2015-3845). The inspectors tracked Entergy's activities regarding the leak and evaluated operability of the reactor coolant pressure boundary.

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. 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

Introduction. The inspectors identified a Green NCV for Unit 2 TS 3.6.1, "Containment," because between August 11 and August 14, 2015, containment out-leakage during accident conditions would have exceeded the containment leakage rate testing program limit specified in TS 5.5.14.c. Specifically, the 24 FCU SW piping developed a hole and Entergy's IOD incorrectly concluded that it did not impact operability.

Description. On August 11, 2015, Entergy discovered a leak on the SW cooling line for the 24 FCU. Unit 2 has five FCUs which provide cooling to the VC during both normal operation and design basis accidents. The FCUs are located inside the VC and operate by blowing air past piping carrying SW. After discovering the leak, Entergy completed an IOD, which determined that all the affected equipment was operable. In their IOD, Entergy specifically discussed the potential impacts to: the containment spray and FCU systems, covered by TS 3.6.6, "Containment Spray System and Containment Fan Cooler Unit System"; the SW system, covered by TS 3.7.8, "Service Water System"; and the containment leakage system, which limits leakage into containment to less than 10 gpm, covered by Technical Requirements Manual Section 3.4.D. The operability determination also stated that the leak had no significant impact to the total containment leakage, such that it would remain within the limits of the 10 CFR 50, Appendix J, program requirements. If they do not meet the Appendix J requirements, the VC is inoperable, and the unit must enter TS 3.6.1.

The inspectors noted that the IOD considered valves SWN-41-4B, SWN-71-4B, SWN-44-4B, and SWN-51-4A to be shut. However, these valves are normally de-energized open, and remained that way after the leak was discovered, so they could not limit the leakage without additional action. Site procedures only direct closing the valves in the case of flooding in containment or in response to an alarm on the FCU SW radiation monitors. At the time the leak was discovered and the IOD was written, the radiation monitors were out of service for maintenance.

In interviews, the operators noted that at the time of the leak discovery they had discussed the possibility of the hole in the pipe allowing too much leakage out of the VC under accident conditions, but had concluded the hole was too small to be a concern.

They did not perform a calculation to compare the observed rate of water in-leakage to air out-leakage under accident conditions before coming to that conclusion.

On August 13, 2015, at about mid-day, the inspectors questioned the technical basis behind the statement that the leak had no significant impact to the Appendix J program requirements. The operators on shift were unable to provide the technical basis, but stated that the POD, which was in progress, would include the basis. At 10:00 p.m. on August 13, 2015, the POD was completed, and it concluded that the Appendix J program requirements were met only while an engineered clamp was installed over the leak as a compensatory measure. On August 14, 2015, at 2:45 p.m., Entergy closed the isolation valves in the SW system to the FCU as part of the tag out to replace the clamp. In this condition, the VC was operable because the assumption that those valves were closed in the IOD were valid. On August 14, 2015, at 8:00 p.m., a qualified clamp was installed and the valves were reopened.

The inspectors determined that the VC was not operable from the discovery of the leak on August 11, 2015, until compensatory measures were properly implemented on August 14, 2015, and TS 3.6.1 was not met. Because Entergy was unaware of their incorrect assumption, they did not take the actions directed by the TS to either restore containment to operable status within four hours of discovery of the condition or be in Mode 3 in another six hours.

Analysis. The inspectors determined that failing to return the VC to operable status or be in Mode 3 within the TS required time is a performance deficiency that was within Entergy's ability to foresee and correct. This finding is more than minor because it was associated with the configuration control attribute of the Barrier Integrity cornerstone, and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers, such as containment, protect the public from radionuclide releases caused by accidents or events. In accordance with IMC 0609.04, "Initial Characterization of Findings," and Exhibit 3 of IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green), because it did not represent an actual open pathway in the physical integrity of reactor containment or heat removal components. For the duration of the violation, SW system pressure remained higher than containment pressure, preventing out-leakage.

This finding had a cross-cutting aspect in the area of Human Performance, Conservative Bias, because Entergy did not demonstrate a conservative bias when they assumed the opening in the pipe was too small to impact containment integrity. [H.14]

Enforcement. TS 3.6.1, "Containment," requires, in part, that if containment is inoperable it be restored to operable status in four hours, and if that cannot be done, the unit be brought to Mode 3 in an additional six hours. Contrary to this requirement, from August 11 to August 14, 2015, containment was not operable and the unit remained in Mode 1. Entergy entered this issue into their CAP as CR-IP2-2015-3550, completed a POD that required compensatory measures, and implemented those compensatory measures on August 14, 2015. Because this violation was of very low safety significance (Green), and Entergy entered this performance deficiency into their CAP, the NRC is treating this as a NCV in accordance with Section 2.3.2 of the NRC

Enforcement Policy. **(NCV 05000247/2015003-02, Incorrect Operability Determination Results in Failure to Comply with Technical Specification for Containment Integrity)**

1R18 Plant Modifications (71111.18 – 2 samples)

Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary 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

- Leak repair for threaded plug in feedwater regulating valve FCV-417 bonnet, EC 58476
- Temporary clamping device on line #495 to the 24 FCU, EC 59340

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 8 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 point were performed and checked, and that results adequately demonstrated restoration of the affected safety functions.

Unit 2

- 23 charging pump using 2-PT-Q033C, 23 Charging Pump, following corrective maintenance on the speed controller on July 6, 2015

- 21 EDG using 2-PT-M021A, Emergency Diesel Generator 21 Load Test, following planned PM on July 14, 2015
- 21 AFW pump using and 2-PT-Q27A, 21 Auxiliary Feedwater Pump, following preventative maintenance on the pump motor on July 21, 2015 (this sample was part of an in-depth review of the AFW system)
- Automatic seal water initiation valve SOV-3519 using 2-PT-Q013, Inservice Valve Tests, Data Sheet 205, following preventative and corrective maintenance on July 27, 2014
- 22 EDG using 2-PT-M021B, Emergency Diesel Generator 22 Load Test, following planned sixteen-year preventative maintenance on August 7, 2015

Unit 3

- 31 ABFP using 3-PT-Q120A, 31 Auxiliary Feed Water Pump, following planned PM on August 25, 2015
- RCS integrity following vessel head O-ring replacement on September 20, 2015
- 33 reactor coolant pump following a balance weight addition to correct high shaft vibrations on September 24, 2015

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

Unit 3 Reactor Vessel Flange O-Ring Replacement Planned Outage

a. Inspection Scope

The inspectors conducted an inspection of Unit 3's planned outage to replace the O-rings on the reactor vessel flange from September 14 to 25, 2015 (3R15E). Prior to the outage, the inspectors reviewed the outage work schedule and outage risk assessment to verify that risk, industry operating experience, previous site-specific problems, and defense-in-depth were considered. The inspectors observed portions of the shutdown and startup to verify the unit was operated in accordance with established procedures and the TSs, and that reactivity changes were made in a controlled manner in accordance with established reactivity plans. The inspectors reviewed logs of the RCS cooldown and heatup to verify temperature and pressure limits were not exceeded. During the outage, the inspectors reviewed:

- Scheduling of maintenance activities, to verify there were no unintended impacts to the outage risk plan
- Tagging and clearance activities, to verify equipment was appropriately configured to safely support the associated work or testing
- The installation and configuration of RCS pressure, level, and temperature instruments to verify they would indicate accurately during changing plant conditions
- The configuration and availability of electrical systems, to verify Entergy complied with the TSs

- The operation of the residual heat removal system and the steam generators while they were being used for decay heat removal, to verify core cooling was maintained
- Vessel draindown and vessel fill activities, to verify RCS inventory was monitored and maintained within the expected ranges
- Activities that affected containment, to verify Entergy was able to restore containment integrity in accordance with their risk plan

The inspectors conducted a walkdown of containment to verify there was no evidence of leakage, tags were cleared, there was no obvious damage to passive systems or recirculation sumps, and that foreign material controls were in place to prevent sump blockage.

After the completion of the outage, the inspectors reviewed Entergy work schedules, to verify covered employees met the requirements of 10 CFR 26. Additionally, the inspectors reviewed CRs to ensure Entergy appropriately identified and resolved problems related to the outage activities.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 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 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 which included RCS leakrate testing and inservice testing:

Unit 2

- 2-PT-Q052, Overtemperature Delta T and Overpower Delta T Bistable Testing and Replacement, on September 11, 2015

Unit 3

- 3-PT-2Y022B, 32 Safety Injection Pump Comprehensive Test, on July 8, 2015 (inservice test)
- 3-PT-Q092D, 34 Service Water Pump Operational Test, on July 22, 2015
- 0-SOP-LEAKRATE-001, RCS Leakrate Surveillance, Evaluation and Leak Identification, beginning on July 28, 2015

b. Findings

No findings were identified.

Cornerstones: Emergency Preparedness

1EP2 Alert and Notification System Testing (71114.02 – 1 sample)

a. Inspection Scope

An onsite review was conducted to assess the maintenance and testing of the Indian Point alert and notification system (ANS). During this inspection, the inspectors conducted a review of the Indian Point siren and tone alert radio testing and maintenance programs. The inspectors reviewed the associated ANS procedures and the Federal Emergency Management Agency approved ANS design report to ensure compliance with design report commitments for system maintenance and testing. The inspection was conducted in accordance with NRC Inspection Procedure 71114.02. 10 CFR 50.47(b)(5) and associated requirements of 10 CFR Part 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP3 Emergency Preparedness Organization Staffing and Augmentation System (71114.03 – 1 sample)

a. Inspection Scope

The inspectors conducted a review of the Indian Point emergency response organization (ERO) augmentation staffing requirements and the process for notifying and augmenting the ERO. The review was performed to verify the readiness of Entergy to respond to an emergency event and to verify Entergy's ability to activate their emergency response facilities (ERFs) in a timely manner. The inspectors reviewed the Indian Point emergency plan for ERF activation and ERO staffing requirements, the ERO duty roster, applicable station procedures, augmentation test reports, the most recent drive-in drill reports, and corrective action reports related to this inspection area. The inspectors also reviewed a sample of ERO responder training records to verify training and qualifications were up to date. The inspection was conducted in accordance with NRC inspection procedure 71114.03. 10 CFR 50.47(b) (2) and associated requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

1EP5 Correction of Emergency Preparedness Weaknesses (71114.05 – 1 sample)

a. Inspection Scope

The inspectors reviewed a number of activities to evaluate the efficacy of Entergy's efforts to maintain the Indian Point emergency preparedness (EP) program. The inspectors reviewed memorandums of agreement with offsite agencies; the 10 CFR 50.54(q) emergency plan change process and practice; Indian Point's maintenance of equipment important to EP; records of evacuation time estimate population evaluation; and provisions for and implementation of primary, backup, and alternative ERF maintenance. The inspectors also verified Entergy's compliance at Indian Point with NRC EP regulations regarding emergency action levels for hostile action events, protective actions for on-site personnel during events, emergency declaration timeliness, ERO augmentation and alternate facility capability, evacuation time estimate updates, on-shift ERO staffing analysis, and ANS back-up means.

The inspectors further evaluated Entergy's ability to maintain Indian Point's EP program through their identification and correction of EP weaknesses by reviewing a sample of drill reports, self-assessments, and 10 CFR 50.54(t) reviews. Also, the inspectors reviewed a sample of EP-related CRs initiated at Indian Point from January 2014 through July 2015. The inspection was conducted in accordance with NRC Inspection Procedure 71114.05. 10 CFR 50.47(b) and the associated requirements of 10 CFR 50, Appendix E, were used as reference criteria.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety and Occupational Radiation Safety

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 – 1 sample)

a. Inspection Scope

The inspectors reviewed the control of in-plant airborne radioactivity and the use of respiratory protection devices in these areas. The inspectors used the requirements in 10 CFR 20, Regulatory Guide (RG) 8.15, RG 8.25, NUREG/CR-0041, TS, and procedures required by TS as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the UFSAR to identify ventilation and radiation monitoring systems associated with airborne radioactivity controls and respiratory protection equipment staged for emergency use. The inspectors also reviewed respiratory protection program procedures and current performance indicators (PIs) for unintended internal exposure incidents.

Engineering Controls

The inspectors reviewed operability and use of both permanent and temporary ventilation systems, and the adequacy of airborne radioactivity radiation monitoring in the plant based on location, sensitivity, and alarm set-points.

Use of Respiratory Protection Devices

The inspectors reviewed the adequacy of Entergy's use of respiratory protection devices in the plant to include applicable as low as is reasonably achievable (ALARA) evaluations, respiratory protection device certification, respiratory equipment storage, air quality testing records, and individual qualification records.

Self-Contained Breathing Apparatus (SCBA) for Emergency Use

The inspectors reviewed the following: the status and surveillance records for three SCBAs staged in-plant for use during emergencies, Entergy's SCBA procedures and maintenance and test records, the refilling and transporting of SCBA air bottles, SCBA mask size availability, and the qualifications of personnel performing service and repair of this equipment.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with the control and mitigation of in-plant airborne radioactivity were identified at an appropriate threshold and addressed by Entergy's CAP.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05 – 1 sample)

a. Inspection Scope

The inspectors reviewed performance in assuring the accuracy and operability of radiation monitoring instruments used to protect occupational workers. The inspectors used the requirements in 10 CFR 20, RGs, applicable industry standards, and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed records of inservice survey instrumentation and procedures for instrument source checks and calibrations.

Walkdowns and Observations

The inspectors conducted walk-downs of plant area radiation monitors and continuous air monitors. The inspectors checked the calibration and source check status of various

portable radiation survey instruments and contamination detection monitors for personnel and equipment.

Calibration and Testing Program

For the following radiation detection instrumentation, the inspectors reviewed the current detector calibration and functional testing results: portal monitors, personnel contamination monitors, small article monitors, portable survey instruments, area radiation monitors, electronic dosimetry, air samplers, and continuous air monitors.

Instrument Calibrator

The inspectors reviewed the calibration standards used for portable instrument calibrations and response checks to verify that instruments were calibrated by a facility that used National Institute of Science and Technology traceable sources.

Problem Identification and Resolution

The inspectors verified that problems associated with radiation monitoring instrumentation were identified at an appropriate threshold and properly addressed in the CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 17 samples)

.1 Initiating Events Performance Indicators (12 samples)

a. Inspection Scope

The inspectors reviewed Entergy's submittals for the following Mitigating Systems cornerstone PIs for the period July 1, 2014, through June 30, 2015:

Unit 2

- Safety System Functional Failures (MS05)
- Emergency AC Power System (MS06)
- High Pressure Injection System (MS07)
- Heat Removal System (MS08)
- Residual Heat removal System (MS09)
- Cooling Water Systems (MS10)

Unit 3

- Safety System Functional Failures (MS05)
- Emergency AC Power System (MS06)
- High Pressure Injection System (MS07)
- Heat Removal System (MS08)
- Residual Heat removal System (MS09)
- Cooling Water Systems (MS10)

To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed Entergy's operator narrative logs, CRs, mitigating systems health reports, LERs, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Emergency Preparedness Performance Indicators (3 samples)

a. Inspection Scope

The inspectors reviewed data for the following three EP PIs: (1) drill and exercise performance (EP01), (2) ERO drill participation (EP02), and (3) ANS reliability (EP03). The last NRC EP inspection at Indian Point was conducted in the fourth calendar quarter of 2014. Therefore, the inspectors reviewed supporting documentation from EP drills and equipment tests from the fourth calendar quarter of 2014 through the second calendar quarter of 2015 to verify the accuracy of the reported PI data. The review of the PIs was conducted in accordance with NRC Inspection Procedure 71151. The acceptance criteria documented in NEI 99-02 was used as reference criteria.

b. Findings

No findings were identified.

.3 Occupational Exposure Control Effectiveness (OR01 – 1 sample)

a. Inspection Scope

The inspectors reviewed Entergy's submittals for the occupational radiological occurrences PI for the fourth quarter 2014 through the second quarter 2015. The inspectors used PI definitions and guidance contained in the NEI 99-02 to determine the accuracy of the PI data reported. The inspectors reviewed electronic personal dosimetry accumulated dose alarms, dose reports, and dose assignments for any intakes that occurred during the time period reviewed to determine if there were potentially

unrecognized PI occurrences. The inspectors conducted walk downs of various locked high and very high radiation area entrances to determine the adequacy of the controls in place for these areas.

b. Findings

No findings were identified.

.4 Radiological Effluent TS/Offsite Dose Calculation Manual Radiological Effluent Occurrences (PR01 – 1 sample)

a. Inspection Scope

The inspectors reviewed Entergy's submittals for the radiological effluent TS/Offsite Dose Calculation Manual radiological effluent occurrences PI for the fourth quarter 2014 through the second quarter 2015. The inspectors used PI definitions and guidance contained in the NEI 99-02 to determine if the PI data was reported properly. The inspectors reviewed the public dose assessments for the PI for public radiation safety to determine if related data was accurately calculated and reported.

The inspectors reviewed the CAP database to identify any potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose. The inspectors reviewed gaseous and liquid effluent summary data and the results of associated offsite dose calculations to determine if indicator results were accurately reported.

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.

b. Findings

No findings were identified.

.2 Annual Sample: Service Water Leakage Evaluation

a. Inspection Scope

The inspectors reviewed two apparent cause evaluations related to SW system pipe leaks documented in Entergy's CAP documents CR-IP2-2013-03759 and CR-IP3-2014-03217. These leaks were reported to the NRC in LERs.

The inspectors completed walk downs of the SW system and interviewed Entergy. The inspectors also reviewed a sample of CAP reports and an Entergy self-assessment and benchmark process document which described current corrective actions and areas for improvement, as well as corrective actions that have been addressed. Through these activities, the inspectors assessed whether Entergy was appropriately identifying, characterizing, and correcting problems associated with SW system leakage and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Entergy CAP and 10 CFR 50, Appendix B.

b. Findings and Observations

No findings were identified.

The review verified that Entergy was adequately identifying, characterizing, and resolving problems related to these SW systems and components and corrective actions for the reported issues were appropriate and timely. CRs of leakage in the SW systems and related CCW components in Unit 2 and 3 were reviewed to confirm Entergy's process for identifying, evaluating, and repairing leakage found in the SW system, including operability determinations, were appropriate to maintain system capability. The inspectors verified that leakage was appropriately identified and dispositioned with an adequate technical basis for assessing SW system integrity.

The inspectors further reviewed CR-IP3-2015-03789 for a small weld leak identified by Entergy during the inspection. The inspectors performed a walk down of the affected area and observed the leakage was minimal. The inspectors concluded that Entergy had identified, assessed, and resolved the leakage concern satisfactorily in accordance with their operability procedures.

.3 Annual Sample: Self-Contained Breathing Apparatus

a. Inspection Scope

The inspectors performed an in-depth review of Entergy's evaluations and corrective actions associated with SCBAs, CR-IP3-2013-03529, and other CRs. Specifically, it was reported that SCBAs that had not met surveillance requirements (SRs) were being maintained in service. The inspectors discussed resolution of the issue with cognizant personnel and reviewed Entergy's procedural guidance and related industry recommendations.

The inspectors assessed Entergy's problem identification threshold, problem analysis, extent of condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to evaluate whether Entergy was appropriately identifying, characterizing, and correcting problems associated with SCBAs and whether the planned and completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Entergy's CAP, procedural requirements, and 10 CFR 50, Appendix B. The inspectors performed a field walkdown of the staged SCBA units and observed partial performance of the monthly SCBA surveillance to assess the adequacy of the completed corrective actions.

b. Findings and Observations

No findings were identified.

In response to the CR, Entergy removed the suspect SCBAs from service and replaced older units with new ones. Entergy reported that at no time were the number of SCBAs available to Unit 3 operators below the minimum required for operations which is four SCBA units and two air carts. The inspectors noted that supplemental air bottles were staged and the SCBA units had hook-up gear to use the supplemental supply for the mission time. In response to the concern, the department manager documented the corrective actions to remove the suspect units from service. The inspectors observed that Entergy conducted a surveillance of one of the Unit 3 control room units using Entergy procedure EN-RP-502-03, “AirHawk II SCBA,” and discussed maintenance of the units with the technician who conducted the test. The inspectors concluded that Entergy had identified, assessed, and resolved the SCBA concern satisfactorily in accordance with their procedures.

.4 Annual Sample: Groundwater Contamination

a. Inspection Scope

Entergy identified a significant increase in tritium activity in three groundwater monitoring wells located adjacent to the Unit 2 Spent Fuel Pool in late March 2014 near the conclusion of the Unit 2 refueling outage. The inspectors reviewed Entergy’s documentation of this event, contained in CR-IP2-2014-02564, and the associated apparent cause evaluation.

b. Findings and Observations

Overview

In response to previously identified tritium (H-3) contamination of on-site groundwater, and in compliance with Entergy’s commitment to the NEI’s Industry Ground Water Protection Initiative – Final Guidance Document 07-07, August 2007, a series of monitoring wells were installed throughout the site, some of which are sampled for tritium on a quarterly basis. Prior to the start of the 2014 Unit 2 refueling outage (2R21), the sampling frequency of wells located near the Unit 2 spent fuel pool, Unit 2 VC, and Unit 2 primary auxiliary building was increased to monthly. This change was due to

previous groundwater spikes which occurred around two previous Unit 2 refueling outages in 2010 and 2012 (2R19 and 2R20) which returned down to previous levels.

In late March 2014, samples from three monitoring wells located near the Unit 2 spent fuel pool (MW-30, MW-31, and MW-32) showed increased groundwater tritium activity as high as 660,000 picocuries per liter (pCi/l) in MW-32. CR-IP2-2014-02564 was written by Entergy to document these results and an apparent cause evaluation was performed. Entergy's short-term response included: increasing well monitoring frequency at MW-30, MW-31, and MW-32 to weekly; conducting an investigation of the cause of the groundwater contamination using Kepner-Tregoe analysis process; and conducting bi-weekly conference calls with the NRC. The results of Entergy's analysis concluded that the source of the contamination was a leak of reactor water during draining of the Unit 2 containment spray header system to a floor drain that overflowed onto the 51-foot elevation of the piping penetration building adjacent to the Unit 2 spent fuel pool.

Unit 2 Spent Fuel Pool Integrity

The inspectors reviewed video inspection records and related reviews of Entergy and contractor evaluations of tritium in local area groundwater, sources, and significance.

Between August 1 and August 7, 2014, underwater remote video examination to VT-1 inspection standards of the cask loading area of the Unit 2 spent fuel pool were conducted. The video examinations done per Visual Procedure WDI-STD- 088, Revision 11, including calibration verification to the ASME VT-1 standard (showing a clear view of characters 0.044" in height) were recorded in 15 digital video files. The inspectors reviewed these files and the related spent fuel pool drawings to establish the extent and validity of these examinations of the Unit 2 spent fuel pool in the cask loading area. For areas of potential degradation, the inspectors confirmed that these areas, although very limited in scope, were identified in the visual examination records and entered into the plant problem identification system and evaluated for significance. In addition, the inspectors observed the condition of the Unit 2 spent fuel pool, leak mitigation areas, and the location of leak identification sites.

Groundwater Monitoring and Conceptual Site Model

Entergy identified that the apparent cause of the high groundwater tritium concentration releases was due to an overflow of RCS water onto the floor of the Unit 2 piping penetration building. The release was at the 51-foot elevation when the floor drain overflowed during drainage of the Unit 2 containment spray header into a floor drain during the March 2014 Unit 2 refueling outage. The containment spray drain-down operation caused water with high concentrations of tritium to exceed the drain flow capacity, pond on the floor, and migrate preferentially through seismic gaps and wall/floor joints into the subsurface. The evidence supporting their conceptual model release scenario was the detection of both Cobalt-58 (Co-58) [radioactive half-life of 71 days] and Chrominum-51 (Cr-51) [radioactive half-life of 28 days] in residual wet deposits below the 51-foot elevation floor. Co-58 and Cr-51 are diagnostic of RCS water and their presence indicates a recent spill event, given their short half-lives.

To test their conceptual model release scenario, Entergy simulated ponding in the seismic gaps and wall/floor joints areas of the Unit 2 piping penetration building at the, 51-foot elevation. The test demonstrated rapid leakage into the layers below the 51-foot elevation level. Entergy proposed that the RCS water leakage drained to an underlying concrete support containing a drain pipe with surrounding sand envelope and then downward to the underlying fractured bedrock. Entergy did not explain in any detail the transport process and rate through the fractured bedrock, or differentiation from other possible leaking SSCs in the vicinity of the three groundwater monitoring wells, MW-30, MW-31, and MW-32.

Upon detailed questioning by the NRC inspection team, no direct evidence was provided to identify how the release moves through the partially saturated zone (perched water system) to the nearby monitoring wells. Entergy pointed to the earlier 2006/2007 tracer tests presented in their "Hydrogeologic Site Investigation Report," dated January 7, 2008, to explain the proposed flow and transport pathway. The tracer test indicated that the perched water-table zones appears to be fracture-flow dominated with numerous stagnation zones where the residual radioactive contaminants are retained and periodically flushed to the underlying water table due to infiltrating rain, snowmelt, and inadvertent releases.

To provide reasonable assurance that the cause of the high tritium groundwater concentrations was identified, the NRC inspection team noted that Entergy has additional information that could be evaluated to conclude the proposed leak pathway (e.g., the rock cores of RW-1, MW-30, MW-31, MW-32, and the downhole geophysical data and analysis presented in U.S. Geological Survey (USGS) Open-File Report 2008–1123, "Flow-Log Analysis for Hydraulic Characterization of Selected Test Wells at the Indian Point Energy Center, Buchanan, New York"). NRC inspection team members independently evaluated the aforementioned USGS report to assess fracture orientation, connectivity, and elevations to determine if there was a pathway from the Unit 2 piping penetration building to the nearby monitoring wells, MW-30, MW-31, and MW-32. The pathway was confirmed by the geologic data in the USGS report.

As a contingency in the event that there may be additional or a different leak source(s), Entergy planned a remediation program using the Unit 2 recovery well (RW-1) to pump down any contaminated groundwater in the vicinity of Unit 2 and to provide a monitored discharge path in the event that future releases occur. Continued monitoring and trending of groundwater data around Unit 2 along with increased frequency of sampling during the spring 2016 Unit 2 refueling outage would provide additional insight into the tritium and Sr-90 plumes behavior. The monitoring program would help determine if the proposed outage related cause was correct and that remediation actions taken (i.e., no RCS draining into the Unit 2 piping penetration building floor drains) were effective to minimize future radioactive releases. In mid-September 2015, Entergy approved the funding required to install and operate the RW-1 pumping system. Entergy's estimated timeline for full operation of this system is May–June 2016.

Entergy provided detailed maps and cross-sections of their long-term groundwater monitoring program monitoring data of the Sr-90 plume. This information is important in defining baseline conditions, if the proposed groundwater pumping of tritium in the recovery well (RW-1) proceeds. Entergy provided results from their modeling of

anticipated drawdown zones and groundwater capture areas for two groundwater pumping scenarios: a 1 gpm pumping rate and a 2 gpm pumping rate for RW-1. The analytical model was based upon a model developed by Dr. Chin-Fu Tsang, Lawrence Berkeley National Laboratory. The modeling objective was to help design a Unit 2 tritium groundwater remediation strategy to avoid influencing a residual Sr-90 plume to the south in and around the Unit 1 spent fuel pools (that were drained by December 2008) and thereby minimize future decommissioning costs at the site.

On July 7, 2015, the NRC inspection team had a teleconference to follow-up on the outstanding issues discussed during the May 7– 8, 2015, inspection visit. In later discussions to confirm tritium data discussed during the teleconference, the inspection team discussed tritium concentrations of 938,300 pCi/l that were detected in MW-30-69 during the February 5, 2015, sampling event. This information, plus new data reporting 426,500 pCi/l of tritium in MW-30-69 during the August 3, 2015, sampling event, is indicative of a new release.

Summary

Entergy proposed a conceptual site model identifying the probable cause of the March 2014 high tritium groundwater concentrations based on a floor spill and leak scenario that occurred during the March 2014 refueling outage. Entergy has corrected this outage work practice to prevent recurrence and has plans for pursuing effective actions if this outage-related groundwater contamination event reoccurs. A significant spike in tritium activity in MW-30 occurred in February 2015, with levels exceeding 900,000 pCi/l, appears to be indicative of a possible second leak pathway unrelated to the 2014 Unit 2 refueling outage and highlights the need for remediation to pump down the tritium plume. This remediation program with supporting monitoring would help minimize releases to the subsurface and provide data to assess where the release(s) are occurring, how much is being released, and revise the conceptual site model. This information is needed to plan and implement a CAP.

Introduction. The inspectors identified a Green NCV of 10 CFR 20.1406(c) in that Entergy did not conduct operations to minimize the introduction of residual radioactivity into the site. Specifically, Entergy did not identify a new leak of tritium into groundwater based on monitoring well results obtained in February 2015 and did not take action to minimize the introduction of residual radioactivity into the subsurface of the site. Entergy entered this issue into their CAP as CR-IP2-2015-03806 with actions to characterize and evaluate this new leak.

Description. Entergy has a previously identified tritium plume in groundwater extending from the areas around Unit 2 structures to the Hudson River. Weekly well monitoring of the area adjacent to the Unit 2 spent fuel pool indicated a significant increase in tritium activity from a sample taken on February 5, 2015, at MW-30-69, of 938,500 pCi/l. The previous four weekly samples from the same well location had a peak tritium activity of 502,000 pCi/l (January 14, 2015). In August 2015, tritium activity remained above 400,000 pCi/l.

Entergy had previously written CR-IP2-2014-02564 for a tritium leak identified in March 2014, near the conclusion of the Unit 2 refueling outage (2R21), which had a

peak tritium activity of 660,000 pCi/l in MW-32 and which also increased tritium activity measured in MW-30-69. Entergy concluded that this leak was associated with outage activities. Although the February 2015 tritium increase was measured at a time when there was no outage at Unit 2, and occurred eleven months after the previous leak, Entergy did not identify this 42 percent increase over the March 2014 activity, as evidence of a new leak of tritiated water into the site groundwater.

Analysis. The inspectors determined that the failure to minimize the introduction of residual radioactivity into the subsurface of the site is a performance deficiency within Entergy's ability to foresee and correct and should have been prevented. Specifically, the leakage of tritium into the site groundwater was not minimized due to Entergy's failure to identify the February 5, 2015, tritium activity increase as evidence of a new leak not previously known. Entergy had contingency plans to interdict any new leak but did not address this issue in a timely fashion. The issue is more than minor because it is associated with the program and process attribute of the Public Radiation Safety cornerstone and affected the cornerstone objective to ensure Entergy's ability to prevent inadvertent release and/or loss of control of licensed material to an unrestricted area. In accordance with IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance (Green) because Entergy had an issue involving radioactive material control, but did not involve: (1) transportation; or (2) public exposure in excess of 0.005 Rem.

The finding had a cross-cutting aspect in the area of Human Performance, Problem Identification and Resolution, in that the resolutions to address the causes for the 2014 tritium leak did not include an extent of condition that recognized the February 2015, tritium spike as a new leak [P.2].

Enforcement. 10 CFR 20.1406(c) requires, in part, that licensees shall, to the extent practical, conduct operations to minimize the introduction of residual radioactivity in the subsurface of the site. Contrary to the above, since February 4, 2015, Entergy did not conduct operations to minimize the introduction of residual radioactivity into the subsurface due to the failure to identify the leak of tritium into the groundwater in February 2015 as a new event nor did it conduct operations to minimize the introduction of this residual radioactivity into the subsurface. Because this violation is of very low safety significance (Green) and Entergy entered this issue into their CAP as CR-IP2-2015-03806, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000247/2015003-03, Failure to Conduct Operations to Minimize the Introduction of Residual Radioactivity to the Site)**

4OA3 Follow Up of Events and Notices of Enforcement Discretion (71153 – 4 samples)

.1 Plant Events

a. Inspection Scope

On June 8, 2015, Unit 3 was manually tripped in response to an unplanned feedwater transient. The transient initiated due to a condensate pump trip due to a motor fault which was complicated when a main feedwater pump did not respond as expected. The reactor trip was uncomplicated, all control rods inserted into the core, and all safety

systems responded as designed. The NRC resident inspectors responded to the control room and independently confirmed that the plant was in a stable, safe condition. The resident inspectors conducted immediate follow-up inspections of the plant and operator response to the event and later reviewed Entergy's evaluation of the event and recovery activities. The inspectors communicated the plant events to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. The inspectors reviewed Entergy's follow-up actions related to the events to assure that Entergy implemented appropriate corrective actions commensurate with their safety significance.

b. Findings

No findings were identified.

.2 (Closed) LER 05000247/2013-004-00: Technical Specification Prohibited Condition Due to an Inoperable Essential Service Water Header as a Result of Pin Hole Leaks in Code Class 3 Service Water Piping

On September 11, 2013, during an engineering walk down of SW temperature control valve SWN-TCV-1103, eight pin hole leaks were discovered in SW piping that supports three radiation monitors. All leaks had minor corrosion product buildup and staining of the piping and floor. Seven leaks were on socket welds and one was on an elbow. The affected SW piping and header were declared inoperable per TS 3.7.8, "Service Water System," and LCO 3.0.3 was entered. The leaking piping was isolated and operability was restored to the required SW header. The corrective actions were to weld repair the affected piping followed by replacing piping with very corrosion resistant material (AL6XN). Entergy concluded the leaks likely existed for greater than the applicable TS allowed action statement time based on visible corrosion products and reported the condition.

The inspectors reviewed LER 05000247/2013-004, the related CR-IP2-2013-03759, and its apparent cause evaluation report dated October 30, 2013, concluding the TS violation was not more than minor because the leaks were small when identified, downstream of the affected HXs in discharge pipe to the river, and in addition to routine walk downs, the area had appropriate drains and detection to respond to any increase in leakage. There was not an impact to the mitigating system cornerstone objective related to system availability, reliability, and capability. Actions were taken upon identification to repair the leak. This failure to comply with TS 3.7.8 action statements constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

.3 (Closed) LER 05000286/2014-002-00: Technical Specification Prohibited Condition Due to an Inoperable Essential Service Water Header as a Result of Socket Weld Leak in Code Class 3 Service Water Piping

On July 16, 2012, during rounds, an operator discovered a SW leak on a socket weld elbow of a three-quarter inch diameter sample pipe connected to the 31 CCW HX SW

discharge pipe upstream of sample valve SWN-49-1. The leak was too small to quantify. The leak was on a component classified as ASME Section XI Code Class 3. The weld leak was evaluated and determined not applicable for acceptance under Code Case N-513-3 because of its location in a socket weld. Entergy concluded the condition had no impact on the SW cooling safety function. The affected SW header was declared inoperable and TS 3.7.9, "Service Water System," was entered until the applicable CCW loop for the 31 CCW HX was isolated. TS 3.7.8, "Component Cooling Water System," was entered for one CCW loop inoperable. The apparent cause was crevice corrosion due to the exposure of unlined carbon steel to brackish SW chloride environment in low flow or stagnant vent/drain piping. As part of their corrective actions, Entergy replaced the affected piping assembly upon identification within the TS allowed outage time.

In 2014, Entergy completed an extent of condition review of past leaks in SW piping and identified that socket weld leak identified and corrected in July 2012, had been reported to the NRC as a condition prohibited by TS. Entergy, in their subsequent review, concluded the leak had likely existed, for an unknown period of time, longer than that provided by applicable TS action statement. Entergy characterized the flaw as crevice corrosion in the three-quarter inch diameter line downstream of the 31 CCW HX and concluded the leak was too small to adversely affect the system function.

The inspectors concluded the late LER submittal, corrected when it was identified, was a minor violation of the timeliness requirements on 10 CFR 50.73, considering the NRC Enforcement Guidance, Section 6.9, Example (d) 9. Additionally, the inspectors reviewed LER 05000286/2014-002, the related CR-IP3-2012-002193 and CR-IP3-2014-03328, and concluded the TS violation was not more than minor because the leak was too small to quantify when discovered; the leak location was downstream of the affected HXs in pipe discharging back to the river; and, in addition to routine walk downs, the area had appropriate drains and detection to respond to any increase in leakage. There was not an impact to the mitigating system cornerstone objective related to system availability, reliability, and capability. Actions were taken upon identification to repair the leak. This failure to comply with TS 3.7.9 action statements constitutes a minor violation that is not subject to enforcement action in accordance with the NRC Enforcement Policy. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

.4 (Closed) LER 05000286/2015-003-00: Technical Specification Prohibited Condition Caused by Failure to Meet Containment Fan Cooler Unit Service Water Flow Rate Due to Improper Service Water Surveillance Test Configuration

On March 3, 2015, while shutdown for a refueling outage, during the performance of 3-PT-R200, "Essential Service Water Header Flow Balance," the as-found SW flow rates for the 31, 32, and 33 FCUs were less than the TS SR 3.6.6.3 that flow be greater than 1430 gpm. The SW essential header was rebalanced by adjusting FCU throttle valves to obtain a minimum flow of 1430 gpm for all five FCUs. On April 9, 2015, an engineering review of test data recorded from test 3-PT-R200, determined that the quarterly test 3-PT-Q16, "EDG and VC Temperature Valves SWN-FCV-1176 and1176A and SWN-TCV-1104 and 1105," is not performed in the correct alignment for validating SW flow for the FCUs per TS SR 3.6.6.3. Test 3-PT-Q16 tests SW flow through FCU with SW isolated through the EDG coolers. This configuration is not consistent with

post-accident operation in which SW is aligned to the FCUs and EDGs. The apparent cause was improper implementation of improved TS requirements. Corrective action was a revision of procedure 3-PT-Q16 to require validation of FCU SW flow with the EDG SW flow control valves and FCU outlet temperature control valves open. The event had no significant effect on public health and safety. The enforcement aspects of this issue are discussed in Section 4OA7. The inspectors did not identify any new issues during the review of the LER. This LER is closed.

4OA5 Other Activities

Operation of an ISFSI at Operating Plants (60855, 60855.1)

a. Inspection Scope

On August 24 to September 2, 2015, the inspectors observed and evaluated Entergy's loading of multi-purpose canister (MPC)-345, the first of four canisters scheduled to be loaded during Entergy's independent spent fuel storage installation (ISFSI) dry cask campaign. The inspectors also reviewed Entergy's activities related to long-term operation and monitoring of their ISFSI. The inspectors verified compliance with the certificate of compliance (CoC), TS, regulations, and Entergy's procedures.

The inspectors observed the movement of the MPC/HI-TRAC into the spent fuel pool, loading of spent fuel assemblies into the MPC, and the movement of the MPC/HI-RAC from the spent fuel pool to the cask wash down area. The inspectors also observed other cask processing operations including welding of the lid to the MPC, NDE of the lid weld, hydrostatic testing, forced helium dehydration of the MPC, preparations for transport, installation of the HI-STORM lid, and transport to the ISFSI pad. During performance of these activities, the inspectors verified that procedure use, communication, and coordination of ISFSI activities met established standards and requirements. The inspectors attended Entergy briefings to assess their ability to identify critical steps of the evolution, potential failure scenarios, and human performance tools to prevent errors. The inspectors reviewed loading and monitoring procedures and evaluated Entergy's adherence to these procedures. The inspectors also reviewed the training of personnel assigned to ISFSI activities.

The inspectors reviewed Entergy's program associated with fuel characterization and selection for storage. The inspectors reviewed cask fuel selection packages to verify that Entergy was loading fuel in accordance with the CoC and TS. The inspectors confirmed that Entergy did not plan to load any damaged fuel assemblies during this campaign.

The inspectors reviewed radiation protection procedures and radiation work permits associated with the ISFSI loading campaign. The inspectors also reviewed the ALARA goal for the cask loading to determine the adequacy of Entergy's radiological controls to ensure that radiation worker doses were ALARA and that project dose goals could be achieved. The inspectors reviewed radiological survey records from the current loading campaign to confirm that dose levels on the HI-TRAC surface were as expected.

The inspectors performed tours of the heavy haul path and ISFSI pad to assess the material condition of the path, pad, and the loaded HI-STORMs. The inspectors also verified that transient combustibles were not being stored on the haul path, ISFSI pad, or in the vicinity of the HI-STORMs. The inspectors checked the operations rover patrol daily logs and verified Entergy was appropriately performing daily HI-STORM vent surveillances in accordance with TS requirements. The annual environmental reports were reviewed to verify that areas around the ISFSI site boundary were within limits specified in 10 CFR 20 and 10 CFR 72.104. The inspectors reviewed Entergy's 10 CFR 72.48 screenings to verify that Entergy had appropriately considered the conditions under which they may make changes without prior NRC approval. The inspectors reviewed revisions to the 10 CFR 72.212 report. The inspectors also reviewed CAP CRs, audit reports, and self-assessments that were generated since Entergy's last loading campaign to ensure that issues were being properly identified, prioritized, and evaluated commensurate with their safety significance.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 14, 2015, the inspectors presented the inspection results to Mr. John Dinelli, General Manager Plant Operations, and other members of the Entergy staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by Entergy and are violations of NRC requirements. They meet the criteria of the NRC Enforcement Policy for being dispositioned as NCVs.

- TS 3.6.6, "Containment Spray System and Containment Fan Cooler System," requires two containment spray trains and three containment fan cooler trains to be operable in Modes 1, 2, 3, and 4. TS SR 3.6.6.3 verifies that each containment FCU cooling water flow rate is equal to or greater than 1400 gpm every 92 days. Contrary to TS SR 3.6.6.3, during an essential SW header flow balance test in accordance with 3-PT-R200 on March 3, 2015, three of the five FCUs had coolant water flow less than the required 1400 gpm. Engineering was contacted prior to continuing 3-PT-R200 and directed operations to continue and adjust the FCU throttle valves to obtain FCU outlet SW flow at or greater than 1430 gpm (to account for 30 gpm correction factor for instrument error). On April 9, 2015, during a review of anomalous data identified during 3-PT-R200, Entergy engineering determined that the quarterly surveillance test, 3-PT-Q016, "EDG and VC Temperature Valves SWN-FCV-1176 and 1176A and SWN-TCV-1104 and 1105," was not performed with the correct SW system alignment. Entergy identified the cause of the condition was improper implementation of improved TS requirements in 2001. Entergy entered this issue into their CAP as CR-IP3-2015-1063 and CR-IP3-2015-2448. The inspectors evaluated this finding using IMC 0609.04, "Initial Characterization of Findings," and

IMC 0609, Appendix A, Exhibit 3, “Barrier Integrity Screening Questions.” The inspectors determined that the finding was of very low safety significance (Green) because the finding did not represent a loss of safety function.

- Unit 2 TS 5.4.1.a requires that the procedures listed in Attachment A to RG 1.33, “Quality Assurance Program Requirements,” Revision 2, be established and implemented. Attachment A states that instructions should be prepared, as appropriate, for draining and changing mode of operations for containment cooling systems. NEI 07-07, Objective 1.2.2, requires licensees to evaluate work practices, such as draining of systems that involve licensed material and for which there is a credible mechanism for the material to reach groundwater. Contrary to the above, Entergy did not evaluate work practices involving changing the mode of operation and draining of the containment spray system (a containment cooling system) to assure that the drainage did not reach groundwater; and as a result, during the Unit 2 refueling outage in March 2014, the containment spray system was drained to a floor drain which subsequently overflowed, spread on the floor of a piping room, and leaked through the floor to groundwater.

  The violation was identified by Entergy in their investigation of groundwater activity identified at the end of the outage during planned sampling of monitoring wells on the site. The issue is a finding as it affected the Public Radiation Safety cornerstone, since Entergy’s actions resulted in an unintended abnormal effluent release. This finding was assessed using IMC 0609D, “Public Radiation Safety,” and was determined to be of very low safety significance (Green) because the subsequent groundwater release was a very small fraction of routine liquid radioactive effluent releases, and did not represent any significant dose impact to the public. Entergy documented the issue in their investigation evaluation (CR-IP2-2014-2564) and corrected the issue by revising their draining procedure OAP-038, “Operations Mechanical Equipment Operating Guidelines,” to assure that contaminated fluids are not discharged outside of the selected drain point. Entergy also provided training to operators on expectations during draining evolutions to assure contaminated liquids are properly controlled.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Entergy Personnel

L. Coyle, Site Vice President
J. Dinelli, Plant Operations General Manager
S. Bianco, Operations Fire Marshal
P. Bode, Radiation Protection Support Supervisor
R. Burroni, Engineering Director
T. Chan, Engineering Supervisor
T. Cramer, Assistant Operations Manager
A. De Donato, Senior Engineer
R. Dolansky, Senior Engineer
R. Drake, Civil Design Engineering Supervisor
J. Ferrick, Production Manager
D. Gagnon, Security Manager
L. Glander, Emergency Preparedness Manager
M. Kempski, Systems and Components Manager
F. Kich, Performance Improvement Manager
J. Kirkpatrick, Regulatory and Performance Improvement Director
M. Lewis, Assistant Operations Manager
N. Lizzo, Training Manager
D. Mayer, Unit 1 Director
B. McCarthy, Operations Manager
F. Mitchell, Radiation Protection Manager
E. Mullek, Maintenance Manager
T. Pasko, Dry Fuel Storage Supervisor
C. Patterson, Reactor Services Manager
W. Riggs, Site Project and Maintenance Services Manager
T. Salentino, Dry Fuel Storage Superintendent
J. Steward, Radiation Protection Supervisor
R. Tamburi, ALARA Supervisor
M. Troy, Nuclear Oversight Manager
R. Walpole, Regulatory Assurance Manager

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000286/2015003-01	FIN	Blocked Drains in the 480 Volt Switchgear Room (Section 1R06)
05000247/2015003-02	NCV	Incorrect Operability Determination Results in Failure to Comply with Technical Specification for Containment Integrity (Section 1R15)
05000247/2015003-03	NCV	Failure to Conduct Operations to Minimize the Introduction of Residual Radioactivity to the Site (Section 4OA2)

Closed

05000247/2013-004-00	LER	Technical Specification Prohibited Condition Due to an Inoperable Essential Service Water Header as a Result of Pin Hole Leaks in Code Class 3 SW Piping (Section 4OA3)
05000286/2014-002-00	LER	Technical Specification Prohibited Condition Due to an Inoperable Essential Service Water Header as a Result of Socket Weld Leak in Code Class 3 Service Water Piping (Section 4OA3)
05000286/2015-003-00	LER	Technical Specification Prohibited Condition Caused by Failure to Meet Containment Fan Cooler Unit Service Water Flow Rate Due to Improper Service Water Surveillance Test Configuration (Section 4OA3)

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Indian Point Unit 2/3, Technical Specifications and Bases
Indian Point Unit 2/3, Technical Requirements Manual
Control Room Narrative Logs
Indian Point Plan of the Day

Section 1R01: Adverse Weather Protection

Procedures

OAP-008, Severe Weather Preparations, Revision 23
OAP-048, Seasonal Weather Preparation, Revision 14

Section 1R04: Equipment Alignment

Procedures
3-COL-CS-001, Containment Spray System, Revision 15
3-COL-RHR-001, Residual Heat Removal System, Revision 28

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9321-F-27513, Flow Diagram Auxiliary Coolant System in PAB & FSB Sheet No. 1, Revision 31
9321-F-27535, Flow Diagram Safety Injection System Sheet No. 1, Revision 42

Section 1R05: Fire Protection

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Section 1R06: Flood Protection Measures

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2015-04857

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Miscellaneous
Unit 3 Action and Commitment item 14218, dated May 13, 1996

Section 1R07: Heat Sink Performance

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2013-03759 2014-05888 2014-06504 2015-02883 2015-02907 2015-02913

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2012-02193 2013-04893 2014-01814 2014-02197 2014-02590 2014-03007
2014-03217 2014-03328 2015-03789

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Unit 3 LER 05000286/2014-002-00

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Assurance of Equipment Operability and Containment Integrity during Design-Basis Accident Conditions (Generic Letter 96-06), dated September 30, 1996
Engineering Standard – Pipe Wall Thinning Structural Evaluation, Revision 0
EPRI – Part 21-60 Day Interim Report Notification: Westinghouse Pressurizer Head Nozzle Inner Corner Region Ultrasonic Inspections, dated June 25, 2015
EPRI NP-7552 Heat Exchanger Performance Monitoring Guidelines, dated December 1991
Indian Point Energy Center NRC Generic Letter 89-13 Service Water Program, Revision 6, dated October 11, 2012
In-Service Test Results for Pressure and Flow for 21 CCP and 32 CCP, dated July 9, 2015
IPEC Ultimate Heat Sink Performance, Revision 2, dated May 19, 2015
IPEC Heat Exchanger Eddy Current Program, Revision 0, dated July 30, 2012
IPEC Heat Exchanger/Eddy Current Program, Revision 1, dated January 1, 2013
Letter – Normandeau Associates, Inc. – Indian Point Zebra Mussel Monitoring Program (Units 2 and 3), dated May 29, 2015
Supplemental Response to Request for Additional Information Regarding NRC Generic Letter 96-09: Assurance of Equipment Operability and Containment Integrity during Design-Basis Accident Conditions, dated January 31, 2003
Unit 2 2-PT-Q030A, 21 Component Cooling Water Pump, Revision 19, dated September 10, 2014
Unit 2 25 FCU Flow Measurement Graph from October 2011 through October 2015
Unit 3 35 FCU Flow Measurement Graph from February 2013 through May 2015
Unit 3 3-PT-Q088, Revision 20, Component Cooling Pumps, dated November 23, 2011
Unit 3 Eddy Current Field Report for 31 EDG Jacket Water Cooler, dated April 7, 2015
Unit 3 Eddy Current Program Heat Exchanger Listing, dated April 29, 2004
Unit 3 IPEC Heat Exchanger Material Upgrade Project (SIPD-1102 and SIPD-1103) – IP3 EDG Jacket Water and Lube Oil Coolers, dated June 29, 2015
Unit 3 Work Orders, WO 362045 and WO 00390681

Section 1R08: Inservice Inspection Activities

Procedures
3-REF-002-GEN, Reactor Disassembly and Reassembly, Revision 11
3-REF-002-GEN, Section 2.9, Reactor Vessel Head Stud Cleaning, Revision 6
3-REF-002-GEN, Section 2.10, Reactor Vessel Head O-Ring Replacement, Revision 4
EN-DC-319, Boric Acid Corrosion Control Program, Revision 11

Condition Reports (CR-IP3-)
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Drawings
234-041-3, General Arrangement Plan for Westinghouse Electric Corporation 173″ Reactor Vessel, Revision 0
IP3V-0439-1600, R.V. Closure Head Assembly Modifications for Closure Gaskets, Revision 1

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Critical Decision Procedure, Section 7.1, Reactor Vessel Flange O-Ring Inspection, dated September 21, 2015

IP3-VGT-15-031, Visual Examination of Pressure Retaining Bolting (VT-1), dated September 20, 2015
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Procedures
2-ECA-0.0, Loss of All AC Power, Revision 13
3-ECA-3.1, SGTR with Loss of Reactor Coolant-Subcooled Recovery Desired, Revision 5
3-POP-1.2, Reactor Startup, Revision 54
EN-OP-116, Infrequently Performed Tests or Evolutions, Revision 12

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Section 1R12: Maintenance Effectiveness

Condition Reports (CR-IP2-)
2014-0364 2014-6235 2015-3432

Procedures
3-XFR-010-ELC, Main Transformer Annual In Service Inspection, Revision 3

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Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
EN-OP-119, Protected Equipment Postings, Revision 7
IP-SMM-OU-104, Shutdown Risk Assessment, Revision 13

Miscellaneous
Daily Risk Briefing Notes
Equipment Out-of-Service Risk Tool

Reactor Head O-ring Replacement Outage Schedule Risk Assessment Report, dated 9/1/15

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
3-ARP-022, Page 67, Reactor Coolant Drain Tank Hi Temperature, Revision 25
3-PT-Q16, EDG, and VC Temperature Valves SWN-FCV-1176 and 1176A and SWN-TCV-1104 and 1105, Revisions 24 and 25
3-PT-R200, Essential Service Water Header Flow Balance, Revision 3
3-REF-002-GEN, Reactor Disassembly and Reassembly, Revision 6
EN-OP-104, Operability Determination Process, Revision 9

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2015-03601 2015-03630

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Miscellaneous
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Section 1R19: Post-Maintenance Testing

Procedures
2-PT-Q017B, Alternate Safe Shutdown Supply Verification to 23 CHP, Revision 11
2-PT-Q033C, 23 Charging Pump, Revision 18
2-SOP-3.1, Charging, Seal Water and Letdown Control, Revision 73
3-AOP-RCP-1, Reactor Coolant Pump Malfunction, Revision 19
3-ARP-013, Pg. 36, Reactor Coolant Pumps High Vibration, Revision 43
3-PT-Q120A, 31 Auxiliary Feed Water Pump, Revision 16
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Tagout AFW-006-31 ABFP MCA

Section 1R20: Refueling and Other Outage Activities

Procedures
3-POP-2.1, Operation at Greater Than 45 Percent Power, Revision 61
3-POP-3.2, Plant Recovery from Trip, Hot Standby, Revision 3
3-POP-4.1, Operation at Cold Shutdown, Revision 35
3-POP-4.2, Operation Below 20 Percent Pressurizer Level with Fuel in the Reactor/Refueling, Revision 35
3-SOP-RCS-009, Reactor Coolant System Fill, Vent, and Pressurization, Revision 37
3-SOP-RCS-017, Reactor Vessel Vacuum Refill and Mansell Level Monitoring System Operation, Revision 13
3-SOP-TG-004, Turbine Generator Operation, Revision 54
EN-OP-115-09, Log Keeping, Revision 2
EN-OP-115, Conduct of Operations, Revision 15

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3-POP-3.3, Attachment 7, Plant Cooldown – Hot to Cold Shutdown, completed September 15, 2015
3-POP-4.1, Attachment 11, Temperature and Pressure Trending, completed September 15–16, 2015
3-POP-15E, O-Ring Issues List, September 14, 2015, September 16, 2015, September 17, 2015, September 19, 2015, September 21, 2015, September 22, 2015, September 23, 2015, September 24, 2015, September 25, 2015
EN-RE-302, Attachment 9.1, Reactivity Plan Form, completed September 14, 2015
Operations Scheduling Spreadsheet
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Section 1R22: Surveillance Testing

Procedures
0-SOP-LEAKRATE-001, RCS Leakrate Surveillance, Evaluation and Leak Identification, Revision 6
3-PT-Q092D, 34 Service Water Pump Operational Test, Revision 20

Condition Reports (CR-IP3-)
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Procedures
IP-EP-AD12, Tone Alert Radio Program, Revision 4
IP-EP-AD20, Indian Point Energy Center Alert Notification System Test, Revision 5
IP-EP-AD30, IPEC ATI Siren System Administration, Revision 5
IP-EP-AD31, IPEC ATI Siren System Maintenance Administration, Revision 2
IP-EP-AD32, IPEC ATI Siren System Routine Polling and Testing, Revision 5
IP-EP-AD33, IPEC ATI Siren System Quarterly Preventative Maintenance, Revision 7
IP-EP-AD35, IPEC Alert Notification System Siren Annual Preventive Maintenance Procedure, Revision 6
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IP-EP-AD41, IPEC ATI Siren Site Annual Sample Preventative Maintenance, Revision 0

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IPEC Tone Alert Radio Program Annual Report 2014, dated February 12, 2015

Section 1EP3: Emergency Preparedness Organization Staffing and Augmentation System

Procedures
EN-EP-310, Emergency Response Organization Notification System, Revision 3
EN-EP-801, Emergency Response Organization, Revision 12
EN-OP 115, Conduct of Operations, Revision 15
EN-TQ-119, Emergency Response Organization Training, Revision 12

Miscellaneous
IPEC-EP, Indian Point Energy Center Emergency Plan, Revision 17
IPEC ERO Call-in Drill, August 5, 2015
IPEC ERO Off Hours Notification Test, 2Q15, June 9, 2015

Section 1EP5: Correction of Emergency Preparedness Weaknesses

Procedures
EN-EP-305, Emergency Planning 10 CFR 50.54(q) Review Program, Revision 3
EN-LI-100, Process Applicability Determination, Revision 16
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IP-EP-AD40, Equipment Important to Emergency Response, Revision 9

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KLD TR-586, Indian Point Energy Center 2013 Population Update Analysis
KLD TR-697, Indian Point Energy Center 2014 Population Update Analysis
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IPEC Actual Event Report, Notification of Unusual Event on May 9, 2015
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Report, IPEC Team Alpha Emergency Planning Exercise on October 7, 2014
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Snapshot Assessment Report: Alternate TSC/OSC Post Implementation, dated August 4, 2015
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Section 2RS3: In-Plant Airborne Radioactivity Control and Mitigation

Procedures
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EN-RP-131, Air Sampling, Revision 13
EN-RP-501, Respiratory Protection Program, Revision 5
EN-RP-502-01, Firehawk M7 SCBA, Revision 0
EN-RP-502-02, Flow Testing MSA Breathing Apparatus, Revision 0
EN-RP-502-03, Airhawk II SCBA, Revision 0
EN-RP-503, Selection, Issue and Use of Respiratory Protection Equipment, Revision 6
EN-RP-504, Breathing Air, Revision 3
EN-RP-505, Portacount Respirator Fit Testing, Revision 6

Section 2RS5: Radiation Monitoring Instrumentation

Procedures
EN-RP-143, Source Control, Revision 10
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EN-RP-303, Source Checking of Radiation Protection Instrumentation, Revision 4
EN-RP-306, Calibration and Operation of the Eberline PM-7, Revision 2
EN-RP-308, Operation and Calibration of the Gamma Scintillation Tool Monitors, Revision 7

EN-RP-313, Operation and Calibration of the ARGOS-Percent AB Personnel Contamination Monitor, Revision 1

Section 4OA1: Performance Indicator Verification

Procedures
EN-FAP-EP-005, Emergency Preparedness Performance Indicators, Revision 4

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DEP PI Data, October 2014–June 2015
ERO Drill Participation PI Data, October 2014–June 2015

Section 4OA2: Problem Identification and Resolution

Procedures
EN-RP-502-03, AirHawk II SCBA

Condition Reports (CR-IP2-)
2013-02920 2013-03219 2014-02564 2014-03739 2014-04898

Condition Reports (CR-IP3-)
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3-Dimensional Portrayals of Subsurface Pathways in and Around MW-30, MW-31, MW-32, and Subsurface Drains Showing Perched-Water Elevations and Relationship to Bedrock
Apparent Cause Evaluation, Elevated Ground Water Tritium Activity Post 2R21
Conceptual Model of the Unsaturated and Saturated Zones in and Around the Units 1 and 2 Areas
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Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion

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2015-3795 2015-3879

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Section 4OA5: Other Activities

Procedures
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2-DCS-001-GEN, Multi-Purpose Canister Inspection. Handling, and Fitup, Revision 9
2-DCS-003-GEN, Hi-Storm Inspection, Handling and Fitup, Revision 6
2-DCS-006-GEN, Vertical Cask Transporter Operation, Revision 12
2-DCS-008-GEN, Unit 2 MPC Loading and Sealing Operations, Revision 19
2-DCS-009-GEN, MPC Transfer and Hi-Storm Movement, Revision 12
2-DCS-023-GEN, Forced Helium Dehydrator Systems Operations, Revision 16
2-DCS-026-GEN, FSB 110 Ton X-Sam Gantry Crane Operations, Revision 11
2-DCS-032-GEN, Dry Cask Loading Readiness Guidelines, Revision 7
2-SOP-17.12, Spent Fuel Handling Machine and Spent Fuel Pit Operations, Revision 19
EN-DC-215, Fuel Selection for Holtec Dry Cask Storage, Revision 6
EN-RP-204, Special Monitoring Requirements, Revision 8
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O-LY-1980, Preparation, Placement, and Collection of Environmental TLDs, Revision 2
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PCI-GQP-1.0, Project Organization and Documentation, Revision 19
PCI-GQP-7.1, Procurement, Receipt, Storage and Issue of ASME II Subsection NCA 3800 Weld Materials, Revision 7
PCI-GQP-8.1, Process Traveler, Revision 18
PCI-GQP-9.0, Training, Qualification, Examination, and Certification of NDE Personnel in Accordance with SNT-TC-1A and CP-189, Revision 15
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PCI-GWS-1, ASME Applications, Revision 2
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RKI Instruments Instruction Manual, Eagle Series – Portable Multi-Gas Detector Part Number 71-0028RK, Revision C, Released February 16, 2011

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2015-03480 2015-03667 2015-03669 CE-2014-00831

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2015-00977 2015-02349 2015-04503

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Quality Assurance Audit Report QA-20-2012-IP-29
Quality Assurance Audit Report QA-20-2013-IP-05
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Holtec Report No. HI-2094405, Dose Versus Distance from a HI-STORM 100S Version B Containing the MPC-32
Indian Point Energy Center, Units 2&3 10 CFR 72.212 Report, Docket 72-0051, HI-STORM 100 System, Licensing Basis Document, Revision 5, dated August 19, 2015

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Training
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2015 Dry Cask Wet Transfer Training
Dry Cask Department Qualification Matrix
PCI ASME IX Welding Procedures Qualification Records

LIST OF ACRONYMS

10 CFR	Title 10 of the *Code of Federal Regulations*
ABFP	auxiliary boiler feedwater pump
AC	alternating current
AFW	auxiliary feedwater
ALARA	as low as is reasonably achievable
ANS	alert and notification system
ASME	American Society of Mechanical Engineers
B&PV	boiler and pressure vessel code
CAP	corrective action program
CCW	component cooling water
CoC	certificate of compliance
CR	condition report
DG	diesel generator
EDG	emergency diesel generator
EP	emergency preparedness
EPRI	Electric Power Research Institute
ERF	emergency response facility
ERO	emergency response organization
FCU	fan cooler unit
FIN	finding
GL	generic letter
HX	heat exchanger
IMC	Inspection Manual Chapter
IOD	immediate operability determination
ISFSI	independent spent fuel storage installation
ISI	inservice inspection
JW	jacket water
kV	kilovolt
LCO	Limiting Condition for Operation
LER	licensee event report

LO	lube oil
MPC	multi-purpose canister
NCV	non-cited violation
NDE	non-destructive examinations
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission, U.S.
PFP	pre-fire plan
PI	performance indicator
PM	preventive maintenance
POD	prompt operability determination
RCS	reactor coolant system
RG	regulatory guide
RPV	reactor pressure vessel
SCBA	self-contained breathing apparatus
SDP	significance determination process
SR	surveillance requirement
SSC	structure, system, and component
SW	service water
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
USGS	U.S. Geological Survey
VC	vapor containment
WO	work order