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

November 8, 2012

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

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT 2 – NRC INTEGRATED INSPECTION REPORT 05000247/2012004

Dear Mr. Ventosa:

On September 30, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Indian Point Nuclear Generating Unit 2. The enclosed integrated inspection report documents the inspection results, which were discussed on October 25, 2012, with you 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 of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance, and because they are entered into your corrective action program (CAP), the NRC is treating these findings as non-cited violations (NCVs), consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCVs 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, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Indian Point Nuclear Generating Unit 2. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, 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 Nuclear Generating Unit 2.

In accordance with 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 Public Document Room of from the Publicly Available Records component of the NRC's document 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/

Mel Gray, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Docket No. 50-247
License No. DPR-26

Enclosure: Inspection Report 05000247/2012004
w/Attachment: Supplementary Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	50-247
License No.:	DPR-26
Report No.:	05000247/2012004
Licensee:	Entergy Nuclear Northeast (Entergy)
Facility:	Indian Point Nuclear Generating Unit 2
Location:	450 Broadway, GSB Buchanan, NY 10511-0249
Dates:	July 1, 2012, through September 30, 2012
Inspectors:	O. Ayegbusi, Acting Senior Resident Inspector S. McCarver, Acting Resident Inspector R. Montgomery, Acting Resident Inspector C. Crisden, Emergency Preparedness Specialist J. Furia, Senior Health Physicist H. Gray, Senior Reactor Inspector T. O'Hara, Reactor Engineer L. Scholl, Senior Reactor Inspector
Approved By:	Mel Gray, Chief Reactor Projects Branch 2 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000247/2012004; 7/1/12 – 9/30/12; Indian Point Nuclear Generating (Indian Point) Unit 2; Operability Determinations and Functionality Assessments.

This report covered a three-month period of inspection by resident inspectors and announced inspections performed by region inspectors. The inspectors identified three findings of very low safety significance (Green), which were NCVs. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within the Cross-Cutting Areas." Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Entergy personnel did not adequately implement procedure EN-OP-104, "Operability Determination Process," Section 5.1, to assess the operability of safety related station batteries on June 4, 2012. Specifically, Entergy personnel did not appropriately determine the impact on operability as a result of inadequate surveillance testing of the 21, 22 and 24 station batteries. Entergy staff re-performed the operability determination, identified the issues as non-conforming and implemented compensatory measures. Entergy entered this issue into the CAP as CR-IP2-2012-4009.

  This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, after inspectors questioned the operability determination, the non-conforming condition was identified and resulted in the station batteries being declared operable with required compensatory measures, revising calculations and implementing a modification to reduce battery load. Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

  The finding had a cross-cutting aspect in the area of human performance with the Decision Making attribute because Entergy personnel did not use conservative assumptions in decision making with regards to the non-conservative testing of safety related batteries and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate it is unsafe in order to disapprove the action. [H.1(b) per IMC 0310] (Section 1R15.1)

- Green. The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XI, “Test Control,” because Entergy did not assure that all testing required to demonstrate safety related batteries will perform satisfactorily was identified and performed in accordance with written test procedures. Specifically, temperature compensation for battery discharge testing was performed incorrectly which caused errors in the battery capacity calculations. Entergy staff immediately reviewed historical test results to confirm the batteries remained operable. Entergy entered this issue into the CAP as CR-IP2-2012-5338.

  This finding is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In addition, it was similar to Example 2c of NRC IMC 0612, Appendix E, Examples of Minor Issues, in that the test control inadequacies affected multiple batteries and the issue was repetitive. Using IMC 0609, Appendix A, “The Significance Determination Process for Findings At-Power,” the inspectors determined the finding screened as very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

  This finding had a cross-cutting aspect in the area of Human Performance, Resources Component, because Entergy did not ensure that complete, accurate, and up-to-date procedures were available and adequate to assure nuclear safety. Specifically, the battery discharge test procedures did not ensure that temperature compensation was correctly applied to provide accurate capacity calculations. [H.2(c) per IMC 0310] (Section 1R15.2)

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” because Entergy staff did not adequately implement procedure EN-OP-104 “Operability Determination Process,” section 5.1, to assess the operability of the 22 static inverter due to a degraded frequency meter on September 7, 2012. Specifically, Entergy personnel did not adequately evaluate the impact of the degraded meter on the operability of the static inverter. This condition caused the inverter to be inoperable. As a result of inspector questions, Entergy staff immediately declared the static inverter inoperable and replaced the frequency meter. Entergy staff entered this issue into the CAP as CR-IP2-2012-5620.

  This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the degraded frequency meter resulted in the static inverter being declared inoperable on September 10, 2012 to replace the frequency meter. Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

The finding had a cross-cutting aspect in the area of human performance with the Decision Making attribute because Entergy personnel did not make safety-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. Specifically, Entergy did not obtain interdisciplinary input and reviews in resolving degraded 22 static inverter frequency meter. [H.1(a) per IMC 0310] (Section 1R15.4)

REPORT DETAILS

Summary of Plant Status

Indian Point Unit 2 began the inspection period at or near 100 percent power. The unit remained at or near full power for the duration of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of Entergy's readiness for the onset of seasonal high temperatures. The review focused on the auxiliary boiler feed pump building and the 21, 22, and 24 battery rooms. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications, control room logs, and the corrective action program to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Entergy personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Entergy's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during hot weather conditions. Documents reviewed for each section of the inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 Impending Adverse Weather

a. Inspection Scope

Because severe weather was forecasted in the vicinity of the facility for September 18, 2012, the inspectors reviewed Entergy's overall preparations/protection for the expected weather conditions. The inspectors walked down systems required for normal operation and shutdown conditions because their safety related functions could be affected, or required, as a result of flooding. The inspectors evaluated the plant staff's preparations in accordance with site procedures to determine if actions were adequate. During the inspection, the inspectors focused on plant specific design features and station procedures used to respond to adverse weather conditions. The inspectors also toured the site to identify loose debris that could become projectiles during a tornado. The inspectors' evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the UFSAR and performance requirements for the systems selected for inspection, and

reviewed whether operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of CAP items to verify that Entergy identified adverse weather impact issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures.

b. Findings

No findings were identified.

1R04 Equipment Alignment

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

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- 23 emergency diesel generator (EDG) after post-maintenance testing on July 11, 2012
- 23 auxiliary boiler feed water pump (ABFP) while the 21 ABFP was out of service for planned maintenance on July 17, 2012
- 21 component cooling water (CCW) pump after post-maintenance testing on September 18, 2012
- 22 fan cooler unit after post-maintenance testing on September 27, 2012

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, technical specifications, work orders, condition reports, 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 staff had properly identified equipment issues and entered them into the corrective action program 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 25, 2012, the inspectors performed a complete system walkdown of accessible portions of the Unit 2 125 Volt DC distribution system to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, drawings,

equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related condition reports and work orders to ensure Entergy appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 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, 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.

- Pre-fire plan (PFP)-208 [fire zone (FZ) 2 and 2A]: General Floor Plan – Primary Auxiliary Building on July 11, 2012
- PFP-209 (FZ 1): Component Cooling Pump Room – PAB 68′0″ – Primary Auxiliary Building on July 11, 2012
- PFP-156 (FZ 140, 240, 241): General Floor Plan – Superheater Building on August 2, 2012
- PFP-252A (FZ 12, 13, 24): Battery Rooms – Control Building on August 13, 2012
- PFP-205 (FZ 14A, 15A, 16A, 17A, 19A): General Floor Plan – Primary Auxiliary Building on August 14, 2012

b. Findings

No findings were identified.

1R07 Heat Sink Performance

Triennial Heat Sink Performance (71111.07T – 3 samples)

a. Inspection Scope

Heat Sink and Heat Exchanger Sample Selection [02.02(a)]

The inspectors selected one heat sink sample and two heat exchanger samples for inspection using Entergy's risk ranking of safety-related heat exchangers, a review of past triennial heat sink inspections, recent operational experience, and resident inspector input. This inspection represents a site-wide inspection (Units 2 and 3 combined) consistent with the information contained in the Indian Point Annual Assessment Letter, dated March 5, 2012, ML12061A159.

Service Water Cooled Heat Exchangers

The inspectors completed an ultimate heat sink inspection of the Unit 3 service water (SW) system in accordance with applicable steps of Inspection Procedure 71111.07, Sections 02.02(b), 02.02(d)(4) and 02.02(d)(6). The SW system removes heat from the CCW system which removes heat from additional safety-related plant systems.

The inspectors reviewed recent design changes to the Unit 3 SW system and verified that the original design of the system had not been adversely affected by the changes. Specifically, the inspectors reviewed changes to the mechanical seals on the 24-inch buried SW pipe and the installation of maintenance access ports in the 409 SW header. The inspectors also reviewed the installation of SW bay water level transmitters to provide operators with indication of available pump head and the replacement of valve SWT-235-2 to improve operation.

The inspectors reviewed current operating and emergency operating procedures for the Unit 3 SW system, including procedures for the loss of the SW system or the ultimate heat sink. The inspectors also verified that instrumentation was available for operational decision making and that the instrumentation was properly maintained.

The inspectors determined that Entergy personnel had established adequate controls and maintenance procedures to detect and prevent system degradation due to macrofouling of the SW system. The inspectors reviewed Entergy's biocide treatment and control procedures. Biocide treatments of the SW system are controlled in accordance with industry standards to maintain low biocide levels to eliminate system fouling from biotic species. System biocide treatments are monitored, trended and evaluated to ensure biotic control.

The inspectors reviewed Entergy's evaluation of the SW pump configuration for Unit 3 and determined that the system arrangement is not subject to the strong-pump, weak-pump interaction phenomena.

The inspectors conducted a walk down of accessible portions of the Unit 3 SW system. Because the SW system contains a significant amount of buried piping the inspectors reviewed documentation of several recent buried piping inspections for Unit 3. Entergy had developed a Buried Piping and Tanks Program and was conducting inspections of

buried piping. The inspectors reviewed the non-destructive examination results from several ultrasonic testing examinations of leaking piping, several visual inspection reports and eddy current testing results from heat exchanger inspections. These results demonstrate that the SW piping and components have structural integrity. The inspectors also reviewed temporary modification (TMOD-27859) installed to mitigate a through wall leak in a 10-inch SW pipe. The inspectors reviewed the structural integrity calculation which demonstrated the acceptability of the structural integrity of the pipe.

The inspectors reviewed a three year summary of corrective action records documenting leaks in SW systems for both Units 2 and 3. Entergy had documented an adverse trend in the number of through-wall leaks in the SW systems for both Units. The increasing trend was documented in both the corrective action process and in their System Health Monitoring Program. Entergy has implemented actions to identify leaks, repair leaks and to replace SW piping with piping material which is more resistant to pitting corrosion. These actions were intended to reverse the adverse trend of SW piping leaks.

Additionally, the inspectors verified that system engineers conducted frequent, documented system walk-downs of the SW system and the results were monitored for adverse trends. The inspectors also verified that operators conducted system observations and monitor system piping for leaks and excessive pump seal leak-off flow during operator shift rounds.

The inspectors verified that Entergy had an active structural monitoring program that included the Unit 3 SW Intake Structure. The condition of the intake structure was being monitored using this program.

Entergy does not perform SW system performance testing to verify SW system heat removal heat capability. As an acceptable alternative, Entergy conducts periodic visual inspections and eddy current testing of the CCW heat exchangers and verifies that SW system flow capability meets original design values.

The inspectors reviewed six recent, Unit 3 SW system in-service surveillance tests (IST). These tests measured system flow and pump vibration. The results of these tests verified the flow capability of the Unit 3 SW system to transfer design basis heat loads to the ultimate heat sink. Entergy system engineers monitor the IST results for adverse trends.

The inspectors verified that Entergy had an active heat exchanger monitoring program. Maintenance and inspections performed under this program monitor piping and components for protective coating failures, and for corrosion and erosion. Additionally, the Buried Piping and Tanks Program and the system engineer walk-down inspections also inspect for these conditions.

Closed Loop Cooled Heat Exchangers

The inspectors completed a heat exchanger inspection of the Unit 2 residual heat removal (RHR) heat exchanger 21 in accordance with applicable steps of Inspection Procedure 71111.07, Section 02.02(c).

The Unit 2 RHR heat exchanger 21 had not been disassembled and inspected due to its inaccessibility and has not had a performance test. Entergy recently completed a

calculation using flow and temperature values from a plant cool-down which demonstrated that the Unit 2, RHR heat exchanger 21 has sufficient heat transfer capacity to perform its design function. Entergy had demonstrated that original design fouling factor assumptions bound the actual heat exchanger fouling factors.

Entergy staff completed calculation CALC-04-01353 which verified that the RHR piping can withstand water hammer stress loads. This calculation established minimum and maximum heat exchanger flow values to provide adequate heat removal and avoid the potential of water hammer.

Entergy's RHR operating procedures contain administrative controls on RHR system allowable heat exchanger flow (maximum and minimum) values to ensure that system piping is not susceptible to excessive flow induced vibration damage during plant operation.

The primary side of the 21 RHR heat exchanger was maintained in a reactor coolant system (RCS) chemistry environment. The secondary CCW cooling system was chemically treated and maintained in accordance with industry standards. Both primary and secondary side systems were controlled, tested and evaluated to maintain a corrosion resistant environment.

There were no plugged tubes in the Unit 2, 21 RHR heat exchanger, and thus there has been no effect on the design heat exchanger performance. Entergy has no record of tube leaks in this heat exchanger. The inspectors noted that Entergy has committed, in license renewal commitment #10, to open and inspect the Unit 2, 21 and 22 RHR heat exchangers during scheduled outages within the next three years. After these committed inspections, Entergy plans on conducting periodic visual and eddy current inspections of both heat exchangers.

The CCW system, which transfers heat from the RHR system heat exchangers to the, SW system, is a closed cooling system which has a surge tank. Entergy operators log the surge tank level and trend the level variations in relation to system leakage and CCW pump seal leak-off flow. No adverse trends have been identified in the CCW surge tank level changes.

Closed Loop Cooled Heat Exchanger

The inspectors completed a heat exchanger inspection of the Unit 3 seal water heat exchanger in accordance with applicable steps of Inspection Procedure 71111.07, Section 02.02(b).

The Unit 3 seal water heat exchanger had not been performance tested and was not routinely disassembled for visual and eddy current inspection due to its inaccessibility. The inspectors noted that Entergy has committed, in license renewal commitment #10, to open and inspect the Unit 3 seal water heat exchanger during scheduled outages within the next three years. After this committed inspection Entergy plans on periodically conducting visual and eddy current inspections on this heat exchanger.

While the Unit 3 seal water heat exchanger had not been performance tested, there are no records indicating performance deficiencies or of leaks in the seal water heat exchanger.

The primary side of the Unit 3 seal water heat exchanger is maintained in an RCS chemistry environment. The secondary CCW cooling system is chemically treated and maintained in accordance with industry standards. Thus, both primary and secondary side systems are controlled, tested and evaluated to maintain a low corrosive environment. Entergy does not have a record of tubes being plugged in the Unit 3 seal water heat exchanger.

Review of Corrective Action Reports

The inspectors reviewed a sample of corrective action program reports related to the SW system, the Unit 2 RHR heat exchangers, the Unit 3 seal water heat exchanger and leaks in above ground and buried piping systems. The review verified that Entergy is appropriately identifying, characterizing, and correcting problems related to these systems and components, and that the planned or completed corrective actions for the reported issues were appropriate. The reports reviewed are listed in Attachment 1.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

.1 Quarterly Review of Licensed Operator Requalification Testing and Training (71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed licensed operator simulator training on August 7, 2012, which included a steam generator tube rupture with a subsequent fault outside containment following a condenser tube leak and a fan cooler unit bearing failure. 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 technical specification 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.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room (71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed and reviewed various activities conducted in the control room, including: plant response to the loss of 138 kV offsite feeder 13W94 on August 28, 2012; and subsequent restoration of the buses fed by the feeder. Additionally, the inspectors observed surveillance test performances, observed procedure use and adherence, crew communications, and coordination of activities between work groups to verify that established expectations and standards were met.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 1 sample)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on SSC performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, 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 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 staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Entergy staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Central control room (CCR) fan flow switch failures

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 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 personnel 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 technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- With 21 charging pump out of service (OOS) for maintenance, and 480 volt under-voltage testing on July 11, 2012
- With 21 ABFP OOS for maintenance, and 21 instrument air closed cooling heat exchanger out of service for maintenance on July 17, 2012
- With safety injection logic testing, and 138 kV cross tie feeder 33332 L/M out of service on July 30, 2012
- With containment pressure bi-stable testing, and AMSAC logic testing on September 10, 2012

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 samples)

a. Inspection Scope

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

- Safety related battery non-conforming conditions due to inadequate surveillance testing identified on June 4, 2012
- EDG reserve fuel oil storage tank out of spec high particulate on June 21, 2012
- 21 EDG fuel oil transfer pump failed during testing on July 13, 2012
- 22 ABFP governor oiler low level on July 17, 2012
- 21 static inverter degraded frequency meter on September 6, 2012

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 technical specification 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 technical specifications 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

1. Inadequate Operability Evaluation of Non-conforming Safety Related Batteries

Introduction: The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Entergy personnel did not adequately implement procedure EN-OP-104, "Operability Determination Process," Section 5.1, to assess the operability of safety related station batteries on June 4, 2012. Specifically, Entergy personnel did not appropriately determine the impact of inadequate surveillance testing on the operability of the 21, 22 and 24 station batteries.

Description: On June 4, 2012, during an extent of condition review of safety related battery load testing issues identified by NRC inspectors at Indian Point Unit 3, Entergy staff determined that the 21, 22 and 24 station battery load testing was non-conservative with respect to each battery's load calculation. Specifically, the load test procedures did not include testing the batteries up to the maximum peak load identified in station battery system calculations. This condition existed since the batteries were last replaced in 2008, 2002 and 2000 respectively. The load test is performed on each station battery to meet TS surveillance requirement (SR) 3.8.4.3, which requires that Entergy verify battery capacity is adequate to supply, and maintain in operable status, the required emergency loads for the design duty cycle when subjected to a battery service test on a frequency of 24 months. Entergy entered the issue into its CAP as CR-IP2-2012-3773.

Using EN-OP-104, "Operability Determination Process," Entergy staff determined the inadequate testing of 21, 22, and 24 batteries, were missed surveillance tests in accordance with TS SR 3.0.3. TS SR 3.0.3 requires that a missed surveillance test be performed from the time of discovery, up to 24 hours or up to the limit of the specified frequency (24 months in this case), whichever is greater. Also, TS SR 3.0.3 requires that a risk evaluation be performed if the testing is to be delayed greater than 24 hours. Entergy's risk evaluation concluded that the risk of delaying the performance of the load test is negligible and TS SR 3.0.3 remained applicable. Based on completing the requirements of TS SR 3.0.3, the Entergy's operability evaluation determined that the 21, 22, and 24 batteries were operable.

The inspectors reviewed Entergy's operability determination and risk evaluation in CR-IP2-2012-3773 and questioned whether Entergy utilized the appropriate process to disposition the non-conforming condition identified due to the non-conservative surveillance testing of the safety related batteries. Entergy pointed the inspectors to prior similar issues involving Task Interface Agreement (TIA) 1992-001 and TIA 2008-004. Entergy concluded that TS SR 3.0.3 was intended to be applied to surveillance tests that had not been previously performed, which Entergy stated was reflected in industry developed implementation guidance TSTF-IG-06-01 (Implementation Guidance for TSTF-358, Revision 6, "Missed Surveillance Requirements"), which has not been approved by the NRC. The inspectors, in consultation with NRC headquarters staff, reviewed Entergy's response and determined that TS SR 3.0.3 was not applicable because the surveillance test had not previously been performed to the maximum peak loads. Therefore, there was not a reasonable presumption of operability based on previous completion of the test to the correct load.

Because the batteries had not been previously tested up to the maximum peak load, the NRC determined this was a non-conforming condition which Entergy was required to

disposition using its operability determination process. Entergy documented the NRC's conclusions regarding the use of TS SR 3.0.3 in CR-IP2-2012-4009 and subsequently revised its operability evaluation in CR-IP2-2012-3773. Using EN-OP-104, Entergy's revised operability determination determined that the inadequate surveillance testing was a non-conforming condition and the batteries were operable with required compensatory measures. The compensatory measures included heightened risk awareness on DC systems; monitoring battery parameters on an increased frequency; revising test procedures and performing the surveillance test at the next available opportunity; revising battery load calculations to regain margin; and performing a modification on the 21 battery by replacing select light bulbs with lower wattage bulbs to reduce battery load.

Entergy revised the battery load calculation for the 22 battery reducing its one minute peak load below the current test of record load values; however the 24 battery one minute peak load remained 9 Amps above the current test of record load values. The 24 battery requires compensatory measures until adequate testing is performed. A modification to replace light bulbs with lower wattage bulbs powered by the 21 battery reduced the 21 battery one minute peak load to within the current test of record load values. Entergy revised the operability evaluation declaring 21 and 22 stations batteries operable. The inspectors reviewed revisions to the operability evaluation and corrective actions completed, and inspected modifications made to the 21 battery system. The inspectors determined that Entergy adequately addressed the issues and no additional operability evaluation issues were identified.

Analysis: The performance deficiency associated with this finding was that Entergy did not adequately implement procedure EN-OP-104, "Operability Determination Process," Section 5.1, to assess the operability of safety related station batteries on June 4, 2012. This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, after inspectors questions the operability determination, the non-conforming condition was identified and resulted in the station batteries being declared operable with required compensatory measures, revising calculations and implementing a modification to reduce battery load. Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

The finding had a cross-cutting aspect in the area of human performance with the Decision Making attribute because Entergy personnel did not use conservative assumptions in decision making with regards to the inadequate surveillance testing of safety related batteries and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate it is unsafe in order to disapprove the action. [H.1(b) per IMC 0310]

Enforcement: 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. Procedure EN-OP-104, "Operability

Determination Process," Section 5.1, requires that an operability determination be performed for degraded or non-conforming TS systems, structures and components. Contrary to the above, on June 4, 2012, Entergy procedure EN-OP-104 was not adequately accomplished to identify and assess the non-conforming condition of the safety related batteries. As a result, when the operability determination was re-performed on June 14, 2012, Entergy personnel identified the batteries as a non-conforming condition and implemented compensatory measures and subsequent modifications in accordance with the operability determination procedure EN-OP-104. Because the violation was of very low safety significance (Green) and it was entered into Entergy's CAP as CR-IP2-2012-4009, this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. (**NCV 05000247/2012004-01, Inadequate Operability Evaluation of Non-conforming Safety Related Batteries)**

2. Inadequate Test Control of Safety Related Batteries

Introduction: The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," because Entergy did not assure that all testing required to demonstrate safety related batteries will perform satisfactorily was identified and performed in accordance with written test procedures. Specifically, temperature compensation for battery discharge testing was performed incorrectly which caused errors in the battery capacity calculations.

Description: The inspectors reviewed the results of station battery TS surveillance discharge testing performed in 2012. Indian Point Unit 2 performs modified performance tests (2-PT-R076A/B/C/D, Station Battery Load Test). Modified performance tests are battery discharge tests which combine multiple discharge rates to accomplish the purposes of service discharge tests and performance discharge tests. Service tests are tests in the as-found condition, of the battery's capability to satisfy the battery duty cycle. The battery duty cycle is the calculated worst case loading required for the battery. Performance tests are used to determine the capacity of a battery, which, when trended and properly evaluated, will accurately determine when a battery is reaching the end of its service life. Initially, performance tests are performed every five years, but the test frequency increases as the battery approaches the end of its service life. Because the battery capacity is used for trending, it is important that the value is accurate since inappropriately low or high values will skew future trend results.

Because temperature has an impact on a battery's capacity, temperature correction is used to adjust the test discharge rate for performance tests. Service tests are not temperature compensated. For modified performance tests, since this test combines both the service test and performance test, there is a temperature compensation for the performance test portion of the test but no temperature compensation for the service test portion of the test.

In 2007, the NRC identified a concern to Entergy about inappropriate temperature correction during discharge testing (CR-IP2-2007-0681). Entergy attempted to resolve this issue by adding a precaution to the test procedures which stated, "There is NO temperature correction for load adjustment on a modified performance test." This change was incorrect because temperature correction should be done for the performance test portion of the modified performance test. This change resulted in all 2010 battery tests not being temperature compensated. The test procedures were changed after the 2010 discharge tests and prior to the 2012 discharge tests to indicate

that the test procedure should include temperature correction for the entire test. This change was also incorrect because the temperature correction should only be for the performance test portion of the test.

During the discharge testing in 2012, the following errors were identified by the inspectors:

- 21 Battery: The procedure provided direction to set the test rate at "284+3.0 Amps" and the computer should then temperature compensate to 290A. Instead of setting the test to 287A, the test was set to 284A, so it was compensated to only 287A instead of 290A. This resulted in overstating the 21 battery's capacity by approximately 1%.
- 22 Battery: This test inappropriately applied temperature correction to the service test portion of the test. Based upon the procedure, the performance test portion of the test should have been set at a rate of 311A. It was set at 310A, but then approximately half of the test was run in manual instead of automatic, which is not a method described in the procedure, and the operator maintained the discharge rate at approximate 319A. The result was an error in the measured capacity of approximately 2.5%. Performing the test in manual was also done on the 23 battery in 2010. For the 23 battery in 2010, maintenance personnel performed the test in manual after equipment problems occurred, but a CR was not written and important documentation was not maintained about the discharge rate or test pause length.
- 23 Battery: This test inappropriately applied temperature correction to the service test portion of the test.
- 24 Battery: This test recorded the initial battery cell temperature as 69°F, then recorded the same temperature next to the computer setting, but had a separate note that read, "Temperature at start of discharge was 77°F." Based on the post battery temperature of 75°F, and the lower than expected battery capacity, it appears that an error was made and the correct battery temperature was below 77°F. This resulted in understating the battery capacity by a maximum of 4.8%.

Based on the observed deficiencies with the battery testing, the inspectors concluded there was reasonable doubt whether the battery test control program would accurately record or recognize indications of a degraded battery in a timely fashion. In response to these issues, Entergy staff reviewed historical test results to confirm the batteries remained operable. Entergy staff also initiated actions to fully evaluate any future testing requirements. Entergy entered the issues into the CAP (CR IP2-2012-5338) and implemented actions to evaluate and correct the deficiencies in the battery testing program. Entergy personnel determined that there were no operability issues for the batteries, and the surveillance test results did not exceed TS acceptable values. The inspectors reviewed Entergy's basis for operability and independently evaluated battery operability. The inspectors determined that Entergy's conclusion was reasonable that the issues identified did not render any of the batteries inoperable, based on the magnitude of the errors and current battery capacity margin.

Analysis: The performance deficiency associated with this finding was that Entergy staff did not assure that all testing required to demonstrate safety related batteries will perform satisfactorily was identified and performed in accordance with written test procedures. This finding is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems Cornerstone and adversely affected the

cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In addition, it was similar to Example 2c of NRC IMC 0612, Appendix E, Examples of Minor Issues, in that the test control inadequacies affected multiple batteries and the issue was repetitive. Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined the finding screened as very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

This finding had a cross-cutting aspect in the area of Human Performance, Resources Component, because Entergy did not ensure that complete, accurate, and up-to-date procedures were available and adequate to assure nuclear safety. Specifically, the battery discharge test procedures did not ensure that temperature compensation was correctly applied to provide accurate capacity calculations. [H.2(c) per IMC 0310]

Enforcement: 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Contrary to the above, between April 2010, and September 30, 2012, Entergy did not assure that all testing required to demonstrate safety related batteries will perform satisfactorily was identified and performed in accordance with written test procedures. Specifically, temperature compensation for battery discharge testing was performed incorrectly which caused errors in the battery capacity calculations. Because this violation was of very low safety significance (Green) and has been entered into Entergy's CAP asCR-IP2-2012-5338, this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000247/2012004-02, Inadequate Test Control of Safety Related Batteries)**

3. Unresolved Item (URI) 05000247/2012004-03, Inadequate Procedure to Maintain 22 Auxiliary Boiler Feed Pump Governor Oiler Level

Introduction: The inspectors identified a performance deficiency, in that Entergy's operating procedure 2-SOP-AFW-001, "Auxiliary Feedwater System Operation," did not provide quantitative and qualitative acceptance criteria for maintaining an adequate 22 ABFP governor oiler level. Specifically, the inadequate procedure resulted in the oiler being empty on a number of occasions, preventing it from supplying oil at the vendor-recommended drip rate to the governor bearing assembly. The inspectors identified a URI for the performance deficiency pending the receipt of Entergy's past-operability determination.

Description: On July 17, 2012, the inspectors identified that there was no visible oil level in the 22 ABFP governor oiler resevoir, which called into question the adequate lubrication of the governor bearing assembly and operability of the 22 ABFP. Entergy staff immediately added oil to the oiler reservoir and documented the condition in CR-IP2-2012-4631. Subsequently, Entergy determined the pump was operable based on an operability evaluation documented in CR-IP2-2011-5447, on November 2, 2011, for a similar condition. This evaluation determined that the pump remained capable of performing its intended function, since the oiler wick within the reservoir remained

saturated. In addition, Entergy determined the pump was operable, because the wick was wet upon discovery, which indicated it had recently flowed oil to the governor bearing assembly.

The governor oiler utilizes a wick feed oiler with an internal cotton wick which when saturated in oil, flows oil to the governor bearing assembly. The oiler design results in a flow of 2 to 5 drops per hour, which correlates to approximately 6 to 15 ounces per month. However, when the reservoir is empty, the wick becomes un-saturated and no oil flows. Once the oil passes through the governor bearing, it accumulates in the governor sump, where through periodic (every 6 months) preventive maintenance (PM), it is drained, measured and recorded to prevent excessive oil accumulation in the sump, which could adversely affect the governor or pump operation.

On July 19, 2012, inspectors again identified that there was no visible oil level in the governor oiler, and that the oiler's wick did not come in contact with the bottom of the reservoir as designed. Entergy immediately added oil to the oiler reservoir, adjusted the wick and documented the conditions in CR-IP2-2012-4756 & 4757.

On July 25, 2012, the inspectors again identified no visible oil level in the reservoir. Entergy staff immediately added oil to the reservoir and documented the condition in CR-IP2-2012-4803. The NRC's recurrent identification of empty oiler reservoirs, resulted in Entergy's initiation of a special log (2-12-079) to verify twice daily that (1) the reservoir oil level is visible, (2) the wick is saturated in oil, (3) entry of the action into operations' logs, and (4) track all oil additions with the CAP.

As a result of implementing the special log, the inspectors noted oil addition to the oiler increased from approximately twice a month, to daily. In addition, Entergy drained the governor sump using the PM procedure, on August 31, 2012, to prevent excess accumulation of oil in the sump and to compare the recorded volume of oil with the 10 ounces collected during the most recent PM performed on July 30, 2012. The oil collected was 8.5 ounces, which was determined by Entergy to be a volume within the range expected for a month.

The inspectors noted that Entergy's operability evaluations for the July 19 and July 25, 2012 conditions also referenced the November 2011 evaluation documented in CR-IP2-2011-5547. The inspectors noted that the evaluation recommended that during oil replenishment, oil addition be maintained at about half way within the reservoir to preclude a siphon effect on the oiler. However, no corrective actions were assigned to implement this recommendation. Furthermore, the evaluation stated that the oiler's oil consumption rate was within the expected range. However, the inspectors identified that this was contrasted by the governor sump draining results obtained on August 31, 2012. Specifically, based on 1999 correspondence between Entergy and the oiler's vendor – Dresser-Rand, Entergy should have expected adding oil to the oiler more frequently and collecting 36 – 90 ounces of oil during the periodic PM.

During the oil additions that followed each event, the inspectors identified that procedure 2-SOP-AFW-001 was referenced for these oil additions, but only required the operator to verify governor oiler level is visible. Hence, the oil added was not quantified nor was an expected level in relation to the wick, specified in this procedure. The inspectors also identified that Entergy staff controlled the wick adjustment with engineering guidance, instead of an established procedure. Entergy initiated CR-IP2-2012-5711, to evaluate

the overall condition of the 22 ABFP governor oiler. The evaluation determined that the monitoring of component and equipment operating parameters was less than adequate. Corrective actions included changing the design of the oiler to a gravity feed style oiler; revising the system monitoring criteria to include tracking governor oil consumption; changing the PM frequency from 6 months to 3 months; and evaluating the past operability of the pump as a result of not having the desired vendor-recommended flow rate to the governor bearing assembly (to be performed under CR-IP3-2012-2400).

This issue will be tracked as a URI, because Entergy's assessment of the impact of inadequate lubrication of the 22 ABFP governor bearing assembly on the past operability of the 22 ABFP with regard to being able to perform its intended safety function for its specified mission time of 29 hours is needed to determine whether the identified performance deficiency is more-than-minor. This information to be developed is tracked in Entergy's CAP under CR-IP3-2012-2400. **(URI 05000247/2012004-03, Inadequate Procedure to Maintain 22 Auxiliary Boiler Feed Pump Governor Oiler Level)**

4. Inadequate Operability Evaluation of 22 Static Inverter with a Degraded Frequency Meter

Introduction: The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Entergy staff did not adequately implement procedure EN-OP-104 "Operability Determination Process," section 5.1, to assess the operability of the 22 static inverter due to a degraded frequency meter on September 7, 2012. Specifically, Entergy personnel did not adequately evaluate the impact of the degraded meter on the operability of the static inverter. This condition caused the inverter to be inoperable.

Description: On September 7, 2012, the 22 static inverter transferred to its alternate power source (non-safety related), which resulted in the inverter being inoperable. Entergy entered TS Action Statement (AS) 3.8.7 for not meeting the requirement to have four inverters operable, and commenced troubleshooting of the inverter. The TS AS requires that Entergy restore the inverter to operable status within 24 hours or shutdown the plant. IP2 has four static inverters normally running; they take safety related DC power from their associated station batteries and provide AC power to their associated safety related instrument bus to power plant instrumentation and equipment. When the inverter senses a degrading condition, it automatically transfers to its alternate power source keeping the 118 volt instrument bus and equipment powered by the bus energized and functional. Entergy's troubleshooting identified a degraded light internal to the inverter's frequency meter. There are two lights internal to the meter corresponding to a low and high frequency setpoint. The lights feed an optical relay on the back of the frequency meter that automatically transfers the inverter to its alternate power source when the frequency needle blocks the light from the relay sensor at the high or low frequency setpoints, or if one of the two lights becomes extinguished. The degraded light identified was associated with the low frequency setpoint and was found extinguished. It caused the inverter to transfer to its alternate power source and prevented Entergy operators from transferring back to the normal power source until the issue was resolved. Entergy entered this issue into its CAP as CR-IP2-2012-5584.

While investigating the extinguished light, the frequency meter was tapped causing the light to come back on. Subsequently, the inverter was transferred back to its normal power source, declared operable and the TS AS exited. On September 10, 2012, NRC

inspectors reviewed CR-IP2-2012-5584 and EN-OP-104 “Operability Determination Procedure,” and questioned Entergy’s decision to declare the inverter operable after restoring the extinguished light by tapping the face of the frequency meter. In addition, the inspectors questioned Entergy’s implementation of EN-OP-104 to assess the condition of the frequency meter light and its ability to remain operable before and during design basis events. Entergy entered the questions into its CAP as CR-IP2-2012-5620. In response to the questions, Entergy determined there was not reasonable assurance the inverter would be able to perform its function in the event of a design basis seismic event and revised its operability determination. Using EN-OP-104, Entergy’s revised operability determination determined that a degraded condition existed with the frequency meter, declared the inverter inoperable, and initiated actions to replace the frequency meter. The frequency meter was replaced and the inverter was declared operable after monitoring. The inspectors noted that Entergy plans to perform an apparent cause evaluation including determining reportability of the inoperable inverter due to non-compliance with its TS. The inspectors also noted that from the time when the inverter was placed back in service and deemed operable on September 7, 2012 to when it was placed on its alternate power source on September 10, 2012 for repairs, the associated 118 V instrument bus remained functional with no impact to downstream loads powered by the instrument bus.

Analysis: The performance deficiency associated with this finding was that Entergy did not adequately implement procedure EN-OP-104 “Operability Determination Process,” Section 5.1, to assess the operability of the 22 static inverter due to a degraded frequency meter on September 7, 2012. This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the degraded frequency meter resulted in the static inverter being declared inoperable on September 10, 2012 to replace the frequency meter. Using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined this finding was of very low safety significance (Green) because it was not a design or qualification deficiency, did not represent a loss of system safety function, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

The finding had a cross-cutting aspect in the area of human performance with the Decision Making attribute because Entergy personnel did not make safety-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. Specifically, Entergy did not obtain interdisciplinary input and reviews in resolving degraded 22 static inverter frequency meter. [H.1(a) per IMC 0310]

Enforcement: 10 CFR 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” requires, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. Procedure EN-OP-104, “Operability Determination Process,” Section 5.1, requires that an operability determination be performed for degraded or non-conforming TS systems, structures and components. Contrary to the above, on September 7, 2012, Entergy procedure EN-OP-104 was not adequately implemented to identify and assess the degraded condition of the 22 static inverter frequency meter, which resulted in the inverter being declared inoperable on

September 10, 2012 to replace the frequency meter as a result of inspector questions. Because the violation was of very low safety significance (Green) and it was entered into Entergy's CAP as CR-IP2-2012-5620, this violation is being treated as a NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000247/2012004-04, Inadequate Operability Evaluation of 22 Static Inverter With A Degraded Frequency Meter)**

1R18 Plant Modifications (71111.18 – 1 sample)

Permanent Modification

a. Inspection Scope

The inspectors evaluated a modification to reduce loading of the 21 safety related station battery on July 5, 2012, by replacing select light bulbs with smaller sized bulbs. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the design change; including completed work packages to remove existing bulbs and install smaller sized bulbs. The inspectors also reviewed revisions to plant drawings, load calculations and interviewed engineering and operations personnel to ensure the modification was reasonably performed.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 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 procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- 21 charging pump after internal check valve repair on July 9, 2012
- 22 containment spray pump after oil leak repair on July 24, 2012
- 21 CCR fan after belt replacement and re-tensioning on July 24, 2012
- 21 charging pump after repair of discharge valves 4001 and 232 on August 20, 2012
- 28 traveling water screen after auto controller repairs on September 6, 2012
- 21 static inverter after frequency meter replacement on September 10, 2012

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 technical specifications, 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:

- 2-PT-Q026F, 26 service water pump test on July 23, 2012
- 2-PT-Q034, 22 ABFP test on July 31, 2012
- 2-PT-Q030A, 21 component cooling water pump test on September 18, 2012
- 2-PT-Q056A, 2-PT-Q056B, 6.9 kV under-voltage and under-frequency relays trip actuating device operational test on September 19, 2012

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 – 1 sample)

a. Inspection Scope

The NSIR headquarters staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures and the Emergency Plan located under ADAMS accession numbers ML12173A177 and ML12184A041 as listed in the Attachment.

Entergy determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of Entergy-generated changes; therefore, this revision is subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06 – 1 sample)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for Unit 2 licensed operators on July 7, 2012, which required emergency plan implementation by an operations crew. Entergy planned for this evolution to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that Entergy evaluators noted the same issues and entered them into the corrective action program.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational/Public Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 1 sample)

a. Inspection Scope

The inspectors used the requirements in 10 CFR Part 20 and guidance in Regulatory Guide 8.38 Control of Access to High and Very High Radiation Areas for Nuclear Plants, the Technical Specifications, and Entergy's procedures required by technical specifications as criteria for determining compliance.

The inspectors determined if there have been changes to plant operations since the last inspection that may result in a significant new radiological hazard for onsite workers or members of the public. The inspectors verified that Entergy has assessed the potential impact of these changes and has implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard.

The inspectors reviewed the last two radiological surveys from selected plant areas. The inspectors verified that the thoroughness and frequency of the surveys are appropriate for the given radiological hazard.

The inspectors conducted walkdowns of the facility, including radioactive waste processing, storage, and handling areas to evaluate material conditions and potential radiological conditions.

The inspectors selected air sample survey records and verified that samples were collected and counted in accordance with Entergy's procedures. The inspectors observed work in potential airborne areas and verified that air samples were representative of the breathing air zone. The inspectors verified that Entergy has a program for monitoring levels of loose surface contamination in areas of the plant with the potential for the contamination to become airborne.

The inspectors selected containers holding nonexempt licensed radioactive materials that may cause unplanned or inadvertent exposure of workers and verified that they were labeled and controlled.

The inspectors observed several locations where Entergy monitors potentially contaminated material leaving the radiologically controlled area and inspected the methods used for control, survey, and release from these areas. The inspectors verified that the radiation monitoring instrumentation had appropriate sensitivity for the type(s) of radiation present.

The inspectors reviewed Entergy's criteria for the survey and release of potentially contaminated material. The inspectors verified that there was guidance on how to respond to an alarm that indicated the presence of licensed radioactive material. The inspectors verified that any transactions involving nationally tracked sources were reported in accordance with 10 CFR 20.2207.

For high-radiation work areas with significant dose rate gradients (a factor of 5 or more), the inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel. The inspectors verified that Entergy's controls were adequate.

The inspectors reviewed radiation work permits for work within airborne radioactivity areas with the potential for individual worker internal exposures. The inspectors evaluated airborne radioactive controls and monitoring, including potentials for significant airborne contamination. For these selected airborne radioactive material areas, the inspectors verified barrier integrity and temporary high-efficiency particulate air ventilation system operation.

The inspectors examined Entergy's physical and programmatic controls for highly activated or contaminated materials stored within spent fuel and other storage pools. The inspectors verified that appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

The inspectors conducted selective inspection of posting and physical controls for high radiation area and very high radiation areas (VHRAs), to the extent necessary to verify conformance with the occupational performance indicator (PI).

The inspectors discussed with the Radiation Protection Manager the controls and procedures for high-risk high and VHRAs. The inspectors verified that any changes to Entergy's procedures did not substantially reduce the effectiveness and level of worker protection.

The inspectors discussed with first-line health physics supervisors the controls in place for special areas that have the potential to become VHRAs during certain plant operations. The inspectors verified that Entergy's controls for all VHRAs, and areas with

the potential to become a VHRA, ensured that an individual is not able to gain unauthorized access to the VHRA.

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02 – 1 sample)

a. Inspection Scope

The inspectors used the requirements in 10 CFR Part 20, Regulatory Guide 8.8 – Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Plants will be As Low As Reasonably Achievable, Regulatory Guide 8.10 – Operating Philosophy for Maintaining Occupational Radiation Exposure As Low as Reasonably Achievable, the Technical Specifications, and Entergy's procedures required by technical specifications as criteria for determining compliance.

The inspectors determined the site-specific trends in collective exposures and source term measurements.

The inspectors reviewed site-specific procedures associated with maintaining occupational exposures as low as is reasonably achievable (ALARA), which included a review of processes used to estimate and track exposures from specific work activities. During the spring 2012 Unit 2 refueling outage (2R20), collective exposure was a record low of 94 person-rem.

The inspectors determined that post-job reviews were conducted and that identified problems were entered into Entergy's corrective action program.

The inspectors selected ALARA work packages and reviewed the assumptions and basis for the current annual collective exposure estimate for reasonable accuracy. The inspectors reviewed the applicable procedures to determine the methodology for estimating exposures from specific work activities and the intended dose outcome.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04 – 1 sample)

a. Inspection Scope

The inspectors used the requirements in 10 CFR Part 20, the guidance in Regulatory Guide 8.13 – Instructions Concerning Prenatal Radiation Exposures, Regulatory Guide 8.36 – Radiation Dose to Embryo Fetus, Regulatory Guide 8.40 – Methods for Measuring Effective Dose Equivalent from External Exposure, Technical Specifications, and Entergy's procedures required by technical specifications as criteria for determining compliance.

The inspectors reviewed the results of radiation protection program audits related to internal and external dosimetry.

The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report on Entergy.

The inspectors reviewed Entergy's procedures associated with dosimetry operations, including issuance/use of external dosimetry, assessment of internal dose, and evaluation of and dose assessment for radiological incidents.

The inspectors verified that Entergy had established procedural requirements for determining when external and internal dosimetry was required. The inspectors verified Entergy's personnel dosimeters that require processing were NVLAP accredited. The inspectors verified the vendor's NVLAP accreditation. The inspectors ensured that the approved irradiation test categories for each type of personnel dosimeter used were consistent with the types and energies of the radiation present, and the way that the dosimeter was being used.

The inspectors evaluated the onsite storage of dosimeters before their issuance, during use, and before processing/reading, and the guidance provided to radiation workers with respect to care and storage of dosimeters.

The inspectors determined that Entergy uses a "correction factor" to address the response of the electronic dosimeter (ED), as compared to thermoluminescent dosimeter/optically stimulated light dosimeter for situations when the ED must be used to assign dose. The inspectors verified that the correction factor was based on sound technical principles.

The inspectors selected dosimetry occurrence reports or corrective action program documents for adverse trends related to electronic dosimeters, such as interference from electromagnetic frequency, dropping or bumping, failure to hear alarms, etc. The inspectors determined that Entergy had not identified any trends and implemented appropriate corrective actions.

The inspectors reviewed Entergy's methodology for monitoring external dose in situations in which non-uniform fields are expected or large dose gradients exist. The inspectors verified that Entergy had established criteria for determining when alternate monitoring techniques were to be implemented.

The inspectors reviewed dose assessments performed using multibadging during the current assessment period. The inspectors verified that the assessment was performed consistently with Entergy's procedures and dosimetric standards.

The inspectors reviewed shallow dose equivalent (SDE) dose assessments for adequacy. The inspectors evaluated Entergy's method for calculating SDE from distributed skin contamination or discrete radioactive particles.

The inspectors evaluated Entergy's neutron dosimetry program, including dosimeter type(s) and/or survey instrumentation.

The inspectors selected neutron exposure situations and verified that (a) dosimetry and/or instrumentation was appropriate for the expected neutron spectra, (b) there was sufficient sensitivity for low dose and/or dose rate measurement, and (c) neutron

dosimetry was properly calibrated. The inspectors verified that interference by gamma radiation had been accounted for in the calibration. The inspectors verified that time and motion evaluations were representative of actual neutron exposure events, as applicable.

For the special dosimetric situations reviewed in this section, the inspectors determined how Entergy assigned dose of record for total effective dose equivalent, SDE, and lens dose equivalent. The inspectors also reviewed Entergy's use of effective dose equivalent external monitoring during the 2R20 refueling outage. The inspectors verified that Entergy's methodology was in compliance with the multiple dosimeter method set forth in ANSI HPS N13.41-1997. During the outage, 24 individuals were monitored in this fashion.

The inspectors verified that Entergy informed workers, as appropriate, of the risks of radiation exposure to the embryo/fetus, the regulatory aspects of declaring a pregnancy, and the specific process to be used for (voluntarily) declaring a pregnancy.

The inspectors selected individuals who had declared their pregnancy during the current assessment period, and verified that Entergy's radiological monitoring program for declared pregnant workers was technically adequate to assess the dose to the embryo/fetus. The inspectors reviewed the exposure results and monitoring controls employed by Entergy and with respect to the requirements of 10 CFR Part 20. A total of four workers had declared pregnancies during the period from January 2011 – June 2012.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 2 samples)

a. Inspection Scope

The inspectors sampled Entergy's submittals for the below listed PIs for Unit 2 for the period of July 1, 2011, through June 30, 2012. 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 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." As applicable, the inspectors reviewed Entergy's operator narrative logs, issue reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

- MSPI – High Pressure Injection System (MS07)
- MSPI – Heat Removal System (MS08)

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 1 sample)

.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 corrective action program 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 corrective action program and periodically attended condition report screening meetings.

b. Findings

No findings were identified.

.2 Annual Sample: Instrumentation Bistable Failures

a. Inspection Scope

The inspectors performed an in-depth review of Entergy's failure analysis and corrective actions associated with condition reports CR-IP3-2009-04167, CR-IP3-2010-01428 and CR-IP2-2012-05478 that documented multiple failures of instrumentation bistables manufactured by Foxboro and NUS corporations. Specifically, these condition reports identified instances where as found data obtained during quarterly surveillance tests is outside of the allowable band specified in the surveillance procedure. A number of condition reports also identified in service failure of bistable modules.

The inspectors assessed Entergy's problem identification threshold, causal analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Entergy's corrective actions to determine whether Entergy was appropriately identifying, characterizing, and correcting problems associated with this issue. The inspectors compared the actions taken to the requirements of Entergy's corrective action program and Title 10 of the *Code of Federal Regulations (*10 CFR) Part 50, Appendix B, Criterion XVI, Corrective Action. In addition, the inspectors reviewed documentation associated with this issue, including condition and failure analysis reports, and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions and the actions planned to complete full resolution of the issue.

b. Findings and Observations

No findings were identified.

The inspectors found that Entergy staff was appropriately entering issues associated with the instrumentation bistables into the corrective action program. Issues were being reviewed for the impact on current and past operability and potential reportability. Causal evaluations and extent of condition assessments were also found to be appropriate. In the cases where setpoint data was found to be out of tolerance the engineering reviews included an assessment of potential adverse trends as indicated by repeated surveillance test issues with a particular module. Modules identified with having an adverse trend were subsequently replaced.

The inspectors found that immediate corrective actions for bistable issues were appropriate. Modules determined to be inoperable were placed in the trip condition and promptly repaired or replaced. The inspectors also reviewed the status of longer term correctives actions that are being taken to address the broader issue of age related failures. The long term actions involve a multi-year plan for replacement of existing modules with new or refurbished modules that do not utilize electrolytic capacitors. Units that do not utilize electrolytic capacitors are designed to have a 40 year service life.

The inspectors also noted that the plant equipment reliability coordinator recently identified an apparent increase in the failure rate of the instrumentation modules and recommended a reassessment of the long term corrective action plan. The plant unit reliability team subsequently directed the component engineer responsible for these units to re-evaluate the issue and present an accelerated action plan to the team in October of 2012. Additionally, the Unit 3 steam generator level control system is currently in a maintenance rule (a)(1) status and as a result control module replacements are being expedited as part of the action plan to restore the system to an (a)(2) status.

The inspectors determined Entergy's overall response to the issue was commensurate with the safety significance. Immediate corrective actions were timely and long term actions, although previously adequate, are being re-evaluated to address an apparent increased failure rate.

4OA5 Other Activities

Buried Piping, TI-2515/812, Phase 1 (1 sample)

a. Inspection Scope

Entergy's buried piping and underground piping and tanks program was inspected in accordance with paragraphs 03.01.a through 03.01.c of the Temporary Instruction (TI) 2515/182 and was found to meet all applicable aspects of the NEI document 09-14, Revision 1, as set forth Table 1 of the TI 2515/182.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 25, 2012, the inspectors presented the inspection results to Mr. John Ventosa, Site Vice President, and other members of the Entergy staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Entergy Personnel

J. Ventosa, Site Vice President
R. Allen, Technical Specialist IV, Code Programs
N. Azevedo, Engineering Manager
J. Baker, Shift Manager
T. Beasely, Engineering
G. Bouderau, Equipment Reliability Coordinator
M. Burney, Nuclear Safety/License IV Specialist
R. Burroni, System Engineering Manager
T. Chan, Engineering Supervisor
T. Cole, NUC Project Manager
P. Conroy, Nuclear Safety Assurance Director
L. Cossio-Gonzalez, Code Programs Engineer
L. Coyle, General Manager Plant Operations
G. Dahl, Nuclear Safety/License IV Specialist
R. Daley, Nuclear Engineer III
M. DeChristopher, System Engineer
D. Dewey, Unit 2 Assistant Operations Manager
J. Dinelli, Operations Manager
R. Dolanksy, ISI Program Manager
R. Drake, Engineering Supervisor
T. Flynn, Maintenance Inspection Coordinator
E. Goethicus, Operations Instructor
D. Gagnon, Security Manager
A. Galati, Design Engineer
C. Ingrassia, System Engineer
F. Inzirillo, Quality Assurance Manager
D. King, NDE Project Manager URS
J. Kirkpatrick, Assistant General Manager Plant Operations
R. Lee, Buried Pipe and Tank Program Lead Engineer
J. Lijoi, Maintenance Superintendent
K. Lo, Structural Engineer
L. Lubrano, Senior Lead Engineer
R. Machado, System Engineer
R. Mages, Senior HP/Chemical Specialist
S. Manzione, Components Engineering Supervisor
D. Mayer, Unit 1 Director
T. McCaffrey, Design Engineering Manager
B. McCarthy, Assistant Operations Manager
J. Miu, Programs and Components Engineer
D. Pennino, Technical Lead, Program & Components Engineering
S. Prussman, Nuclear Safety/License IV Specialist
R. Robenstein, Simulator Superintendent
T. Salentino, Dry Fuel Storage Superintendent
S. Sandike, Senior HP/Chemical Specialist
A. Singer, Licensed Operator Requalification Training Superintendent
R. Tagliamonte, Radiation Protection Manager

M. Tesoriero, Programs and Components Manager
J. Timone, Components Engineer
J. Thaliath, Nuclear Engineer Ii
M. Troy, Engineering Manager
R. Walpole, Licensing Manager
W. Wittich, Design Engineering Supervisor
D. Williams, Maintenance Manager
M. Woodby, Engineering Director

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened		
05000247/2012-004-03	URI	Inadequate Procedure Guidance to Maintain 22 ABFP Governor Oiler Level (Section 1R15.3)
Opened/Closed		
05000247/2012-004-01	NCV	Inadequate Operability Evaluation of Non-conforming Safety Related Batteries (Section 1R15.1)
05000247/2012-004-02	NCV	Inadequate Test Control of Safety Related Batteries (Section 1R15.2)
05000247/2012-004-04	NCV	Inadequate Operability Evaluation of 22 Static Inverter with a Degraded Frequency Meter (Section 1R15.4)

LIST OF DOCUMENTS REVIEWED

Common Documents Used
Indian Point Unit 2, Control Room Narrative Logs
Indian Point Unit 2, Individual Plant Examination
Indian Point Unit 2, Individual Plant Examination of External Events
Indian Point Unit 2, Plan of the Day
Indian Point Unit 2, Technical Specifications and Bases
Indian Point Unit 2, Technical Requirements Manual
Indian Point Unit 2, Updated Final Safety Analysis Report
Part 9900 Technical Guidance, Mechanical – Freeze Plugs, 06/14/93

Section 1R01: Adverse Weather Protection

Procedures
OAP-048, Seasonal Weather Preparation, Revision 13

Condition Reports (CR-IP2-)
2012-5303 2012-5461 2012-5741

Section 1R04: Equipment Alignment

Procedures
2-COL-21.3, Steam Generator Water Level, Revision 31
2-COL-4.1.1, Component Cooling System, Revision 26
2-COL-27.1.6, Instrument Buses, DC Distribution and PA Inverter, Revision 25
2-COL-10.3, Containment and PAB Cooling and Filtration, Revision 18
2-SOP-27.3.1.3, 23 Emergency Diesel Generator Manual Operation, Revision 20

Condition Reports (CR-IP2-)
2012-0594 2012-0602 2012-4898 2012-5439 2012-5744 2012-5822
2012-1777 2012-1810 2012-2223 2012-2318 2012-4510 2012-4837

Maintenance Orders/Work Orders
52308559 00306426

Drawings
A208501, One-line Diagram for 125 VDC Distribution Panels 21, 21A, 21B, 22, and 22A, Revision 40
138559, Diagram of Connections Instrument Flight Panel 48V and 125 VDC Distribution Panels, Revision 20
208088, One-line Diagram of 480 VAC SWGR 21 & 22, Bus 2A, 3A, 5A, 6A, Revision 44
9321-2018, Flow Diagram Condensate and Boiler Feed Pump Suction, Revision 146
9321-F-2019, Flow Diagram Boiler Feedwater, Revision 116

Section 1R05: Fire Protection

Procedures
0-PT-004, Fire Extinguisher Inspection, Revision 6
2-PT-EM19, Cable Spreading Room Halon System, Revision 11
EN-DC-161, Control of Combustibles, Revision 6
IP2-RPT-03-00015, Unit 2 Fire Hazards Analysis Report, Revision 5
PFP-156 (FZ 140,240, 241): General Floor Plan – Superheater Building, Revision 13
PFP-205 (FZ 14A, 15A, 16A, 17A, 19A): General Floor Plan – Primary Auxiliary Building, Revision 0
PFP-208 (FZ 2, 2A): General Floor Plan – Primary Auxiliary Building, Revision 0
PFP-209 (FZ 1): Component Cooling Pump Room – PAB 68'-0" – Primary Auxiliary Building, Revision 0
PFP-252A (FZ 12, 13, 24): Battery Rooms – Control Building, Revision 0

Condition Reports (CR-IP2-)
2011-1032 2012-4067

Maintenance Orders/Work Orders
52310549

Section 1R07: Heat Sink Performance

System Health Reports
Indian Point Energy Center (IPEC) Unit 2, Service Water (SW) System Health Report, Q1-2012, 88.72 (White)
IPEC Unit 3, SW System Health Report, Q1-2012, 81.27 (Yellow)
IPEC Unit 2, CCW, System Health Report, Q2-2012, 93.97 (White)
IPEC Unit 3, CCW, System Health Report, Q2-2012, 94.03 (White)
IPEC SW System Component Leaks – Unit 2 Only (60), 7/24/12
IPEC SW System Component Leaks – Unit 3 Only (116), 7/24/12

Procedures
O-CY-2510, Closed Cooling Water Chemistry Specifications and Frequencies, 11/29/11, Revision 13
O-CY-3115, Bacteria By ATP Analysis, 2/15/11, Revision 4
2-POP-3.3, Plant Cooldown – Hot To Cold Shutdown, 2/27/12, Revision 77
2-SOP-4.2.1, Residual Heat Removal System Operation, 5/16/12, Revision 64
3-AOP-SWL-1, Low Service Water Bay Level, Revision 0
3-AOP-SW-1, Service Water Malfunction, Revision 02
3-APR-012, Alarm Response, Intake Structure Alarm Panel, Revision 48
3-APR-049, Intake Structure, Revision 6
3-SOP-RW-007, Circulating and Service Water Sodium Hypochlorite Injection System, 6/26/12, Revision 39

Drawings
A209762-71, Indian Point Unit 2 Flow Diagram Service Water System Nuclear Steam Supply Plant, Sheet 2 of 2, Revision 71
A234191-46, Indian Point Unit 2 Flow Diagram Closed Cooling Water System
9321-F-2033-81, Indian Point Unit 2 Flow Diagram Service & Cooling, River Water & Fresh Water, Revision 81
9321-F-20333, Sheet 1, Indian Point Unit 3 Flow Diagram Service Water System, Revision 50
9321-F-20333, Sheet 2, Indian Point Unit 3 Flow Diagram Service Water System, Revision 29
9321-F-2722-126Z, Sheet 1of 2, Indian Point Unit 2 Flow Diagram Service Water System Nuclear Steam Supply Plant, Revision 126
9321-F-27223, Indian Point Unit 3 Flow Diagram Service Water System Nuclear Steam Supply Plant, Revision 46

Service Water System Design Changes
EC No. 19340, IP3 Install access ports in 409 SW header, Revision 0
EC No. 24032, IP3 24 inch buried pipe mechanical seals, Revision 0
EC No. 24608, IP3, 3R16 Replacement of Valve SWT-235-2, Revision 0
EC No. 2976, IP3 Install SW Bay Level Transmitters, Revision 0

Temporary Modifications
TMOD 27859; Temporary seismic class I piping clamp on non-code piping leak repair

Licensing and Design Basis Documents
Indian Point Unit 2, UFSAR Section 9.3 Component Cooling Water & Residual Heat Removal
Indian Point Unit 2, UFSAR Section 9.6.1 Service Water Section #1
Indian Point Unit 2, UFSAR Section 9.6.1 Service Water Section #2
Indian Point Unit 2, UFSAR Section 9.6.1 Service Water Section #3

Indian Point Unit 3, Design Basis Document (DBD)-311, Chemical and Volume Control System (CVCS), Revision 2
Indian Point Unit 3, UFSAR Section 9.3 CCW & RHR
Indian Point Unit 3, UFSAR Section 9.6.1 Service Water Section #1
Indian Point Unit 3, UFSAR Section 9.6.1 Service Water Section #2

Engineering Calculations, Analyses, Specifications, and Design Changes
Calculation CN-SEE-03-5, Indian Point Unit 2 RHR Cooldown Analysis for the 5 percent Power Uprate (Westinghouse Proprietary Class 2), 3/10/05, Revision 0
IP-CALC-04-01353; Structural Evaluation of the Residual Heat Removal Piping Subjected to Water Hammer Loading; Altran Calculation No. 95146-TR-02, Volume 1 of 2, June 1995, Revision 0
Westinghouse Plant Manual, Volume I, Part 2

Completed Tests, Surveillances, and Inspections
21 Component Cooling Water Heat Exchanger Inspection Report, 9/27/11 (Visual Inspection Report and Mistras Eddy Current Testing Report 21-186, 9/27/11)
22 Component Cooling Water Heat Exchanger Inspection Report, 11/16/11 (Visual Inspection Report and Mistras Eddy Current Testing Report 21-188, 11/15/11)
31 SWP Component Cooling Water HTX; Visual Inspection, Cleaning and Eddy Current Testing, 5/15/12
32 CCW HX Inspection Report, 5/24/10, SWP Component Cooling Water HTX; Visual Inspection, Cleaning and Eddy Current Testing, 5/15/12
Buried Piping and Tanks General Visual Inspection Report, 11/23/11, IP2 Service Water 24 inch Line 409 (W.O. #279576-02)
Elite Pipeline Services, Report of Internal Inspection of 24 inch Service Water Line #409, 5/16/11
Elite Pipeline Services, Report of Visual Inspection of Unit 3, 24 inch Service Water Line #408, 4/2/09
Elite Pipeline Services, Report of 5/20/12; Visual Inspection of IP2, 24 inch SW Line #40, from 2R20
Entergy Nuclear Engineering Report: Maintenance Rule Structural Monitoring Inspection Report (4^{th} Cycle) for Intake Structure, 4/26/11
General Electric (GE) Inspection Technologies Report, 4/13/09; Remote Visual Inspection of SW Line #1009 on 3/31/11
General Electric (GE) Inspection Technologies Report, 5/24/11; Remote Visual Inspection of SW Line #1093 on 3/22/11
IP2 Heat Exchanger Tube Plugging Summary, 7/26/12
IP2 Service Water 24 inch Line 408 (W.O. #279576-02), Buried Piping and Tanks General Visual Inspection, 11/5/11
IP2 Service Water 24 inch Line 409 (W.O.# 279576-02) Buried Piping and Tanks General Visual Inspection, for CR-IP2-2011-06248
IP3 Heat Exchanger Tube Plugging Summary, 7/26/12
IP3 Service Water 3 inch Lines 1196, 1197 and 1200; Buried Piping and Tanks General Visual Inspection, 6/11/12
MISTRAS Preliminary Report of Eddy Current Inspection, #32 CCW Heat Exchanger, PR No.:32-244, 2/25/10
UT/Corrosion Data Sheet, IP2-UT-12-002, 1/20/12 (3 pages)
UT Erosion/Corrosion Examination Data Sheet, IP2-UT-11-048, 24 inch Service Water Header, 12/28/11
UT Erosion/Corrosion Examination Data Sheet IP2-UT-11-050, 11/28/11 (4 pages)
UT Erosion/Corrosion Examination Data Sheet IP2-UT-11-050, 12/23/11 (4 pages)

UT Erosion/Corrosion Examination Data Sheet, IP2-UT-12-002 (3 pages), 24 inch, SW Line 409, 1/20/12

Condition Reports (CR- IP2)

2007-3822	2009-2982	2009-3081	2009-3115	2009-3871	2009-4491
2011-1414	2011-1719	2011-2304	2011-4798	2011-6031	2012-0050
2012-2222	2012-2692				

Condition Reports (CR- IP3)

2010-0937	2011-0053	2011-0622	2011-0697	2011-0680	2011-1045
2011-1158	2011-1440	2011-2902	2011-4249	2011-4938	2011-4953
2011-5293	2012-0905	2012-1437	2012-1904	2012-2295	

Specifications, Vendor Documentation

PMX Heat Exchanger Documentation for Indian Point Unit No. 3, Report PMX-9002, May 24, 1990 (Seal Water Heat Exchanger)

Program Documents

Entergy Nuclear Engineering Report EN-DC-147, Indian Point Units 2 & 3, Eddy Current Program, 9/7/06, Revision 2

Entergy Program Section No. SEP-SW-001, NRC Generic Letter 89-13 Service Water Programs, 2/14/12

Miscellaneous

ASME, Section XI, Subsection IWA 5244 Testing of buried components

Entergy Letter NL-12-089 dated June 14, 2012, Subject: Reply to Request for Additional Information Regarding the License Renewal Application, Indian Point Generating Unit Nos. 2 & 3, Docket Nos. 50-247 and 50-286, License Nos. DPR-26 and DPR-64 (includes Attachments 1 and 2)

NRC Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment, 7/18/89

Section 1R11: Licensed Operator Requalification Program

Procedures

LRQ-SES-23B, Ruptured Steam Generator with Subsequent Fault Outside Containment, Revision 7

Condition Reports (CR-IP2-)

2012-2523	2012-3078	2012-3695	2012-3848	2012-4217

Section 1R12: Maintenance Effectiveness

Completed Procedures

2-PT-M58, CCR Ventilation Area Radiation Monitors and Control, Revision 40, dated April 4, 2012

Condition Reports (CR-IP2-)

2011-6044	2012-0260	2012-0286	2012-0322	2012-2596	2012-5934
2012-6020					

Maintenance Orders/Work Orders
311202 324695

Drawings
9321-LL-3126, CCR Air Conditioner 10HP Evaporator Fan Control & Indication, Revision 24
IP2-S-000258, Control Room Back-up Vent Fan Power and Control, Revision 11

Miscellaneous
Dwyer Instruments Bulletin E-51, Series 1620 – Single and Dual Pressure Switches

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
EN-WM-104, On Line Risk Assessment, Revision 7
IP-SMM-WM-101, Online Risk Assessment, Revision 3
IP-SMM-OP-104, Offsite Power Continuous Monitoring and Notification, Revision 13

Miscellaneous
Operator Narrative Logs, July 17, 2012
Operator Narrative Logs, July 30, 2012
Operator's Risk Report, July 17, 2012
Operator's Risk Report, July 30, 2012

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
0-TUR-403-AFP, Worthington Auxiliary Boiler Feed Pump Turbine Preventive Maintenance, Revision 7
2-AOP-IB-1, Loss of Power to an Instrument Bus, Revision 10
2-PT-M021A, Emergency Diesel Generator 21 Load Test, Revision 21
2-PT-Q034, 22 Auxiliary Feed Pump, Revision 27
2-SOP-AFW-001, Auxiliary Feedwater System Operation, Revision 4
EN-HU-102, Human Performance Traps & Tools, Revision 12
EN-OP-115, Conduct of Operations, Revision 13

Completed Procedures
2-PT-R076A, Station Battery 21 Load Test, dated on 3/13/12
2-PT-R076B, Station Battery 22 Load Test, dated on 3/22/12
2-PT-R076C, Station Battery 23 Load Test, dated on 4/3/10
2-PT-R076D, Station Battery 24 Load Test, dated on 3/19/10, 3/18/12

Condition Reports (CR-IP2-)

2007-0681	2011-5547	2012-3773	2012-4009	2012-4113	2012-4568
2012-4580	2012-4631	2012-4634	2012-4721	2012-4756	2012-4757
2012-4803	2012-5338	2012-5584	2012-5620		

Maintenance Orders/Work Orders
52396870

Drawings
Figure 37 Assembly of Mechanical Shaft Governor

Miscellaneous
Correspondence between Dresser-Rand and Dennis Colwell, January 26, 1999
OAP-017, Plant Surveillance and Operator Round, Revision 7, Attachment 3, Special Log Tracking Sheet, Special Log No: 2-12-079
PMCR Request Form for Essential Tasks, Attachment 9.1, Increase PM Frequency on the Draining of 22 and 32 ABFP Governor Housing From 6 Months to 3 Months (Quarterly)
TSTF-IG-06-01, Implementation Guidance for TSTF-358, Revision 6, "Missed Surveillance Requirements," May 2006

Section 1R18: Plant Modifications

Maintenance Orders/Work Orders
319784

Miscellaneous
EC-38425, Replacement of Light Bulbs in Various Turbine Building/Control Building/Diesel Building Locations in Support of Battery 21 Margin Reduction, dated June 29, 2012, Revision 0

Section 1R19: Post-Maintenance Testing

Procedures
0-VLV-426-VGB, Conval Clampseal Glob Valves, Inspection and Repair, Revision 1
2-AOP-CVCS-1, Chemical and Volume Control System Malfunction, Revision 8
2-AOP-LEAK-1, Sudden increase in Reactor Coolant System Leakage, Revision 8
2-AOP-RCP-1, Reactor Coolant Pump Malfunction, Revision 12
2-COL-3.1, Chemical and Volume Control System, Revision 41
2-PT-2Y022A, 21 Charging Pump Comprehensive test, Revision 1
2-PT-Q035B, 22 Containment Spray Pump Test, Revision 17
EN-IS-124, Industrial Safety Planning & Job Safety Hazards Analysis, Revision 4
EN-WM-100, Work Request (WR) Generation, Screening and Classification, Revision 8
EN-WM-102, Work Implementation and Closeout, Revision 7
EN-WM-105, Planning, Revision 10
O-PIP-401-FRZ, Piping Freeze Seal Procedure, Revision 1

Completed Procedures
0-FAN-401-HVA, Inspection and Repair of HVAC/Plant Ventilation Fans, Revision 6, dated August 2, 2012
2-PT-Q033A, 21 Charging Pump, Revision 16, dated July 14, 2012
2-PT-W020, Electrical Verification – Inverters and DC distribution in Modes 1 to 4, Revision 3, dated September 10, 2012

Condition Reports (CR-IP2-)

2010-0864	2012-3197	2012-4763	2012-4894	2012-4976	2012-5238
2012-5256	2012-5308	2012-5387	2012-5388	2012-5393	2012-5490
2012-5620					

Maintenance Orders/Work Orders

314589	315254	317005	320775	322037	325062
325833	326203	52387052			

Drawings
9321-F-2736, Chemical & Volume Control System, Revision 129

Miscellaneous
EN-DC-214, Freeze Seal Evaluation Form for EC-37562/WO-315254
IPTE Supplemental Controls, Install Freeze Seal to Support Repairs to valve 232,
JSHA# 2012-28, EC-39336, EC-39338, EC-39359, EC-37562, ECN-39304

Section 1R22: Surveillance Testing

Procedures
2-PT-Q026F, 26 Service Water Pump, Revision 14
2-PT-Q030A, 21 Component Cooling Water Pump, Revision 18
2-PT-Q034, 22 Auxiliary Feed Pump, Revision 27
2-PT-Q56A, 6.9 KV Undervoltage Relays Trip Actuating Device Operational Test, Revision 3
2-PT-Q56B, 6.9 KV Underfrequency Relays Trip Actuating Device Operational Test, Revision 3

Condition Reports (CR-IP2-)
2012-3294 2012-3535 2012-4127 2012-4614 2012-4769

Maintenance Orders/Work Orders
315217 315218 319934 52424710 52424711

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Procedures
Emergency Plan, Revision 13
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Section 1EP6: Drill Evaluation

Procedures
IPEC-EP, Emergency Plan, Revision 13

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Procedures
EN-RP-101, Access Control for Radiologically Controlled Areas, Revision 6

Sections 2RS2: Occupational ALARA Planning and Controls

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Section 4OA1: Performance Indicator Verification

Procedures
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EN-LI-114, Performance Indicator Process, Revision 4, High Pressure Injection, 3rd Quarter 2011 – 2nd Quarter 2012

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Operator Logs, Safety Injection Pumps, July 2011 – June 2012
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Section 4OA2: Problem Identification and Resolution

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2010-5484	2010-5542	2010-6716	2011-0597	2011-4680	2012-0251
2012-1010	2012-4240	2012-5478	2012-5917		

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2011-0370	2011-0873	2010-1428	2011-2330	2011-2332	2011-2368
2011-2758	2011-3322	2011-3617	2011-3885	2009-4167	2011-4271
2011-4660	2011-4675	2009-4823	2011-5297	2011-5686	2012-0172
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Section 4OA5: Other Activities

Procedures
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EN-CY-111, Radiological Ground Water Monitoring Program, Revision 2
EN-DC-343, Nuclear Management Manual, Underground Piping and Tanks Inspection and Monitoring Program, Revision 5
EN-EP-S-002-MULTI, Buried Piping and Tanks General Visual Inspection, Revision 0
EN-IS-112, Trenching, Excavating and Ground Penetrating Activities, Revision 7
SEP-UIP-IPEC, Underground Components Inspection Plan, Revision 0

Condition Reports (CR-IP2-)
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MapPro Buried Pipe Overview Drawings of Selected Lines and Tanks

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PCA Engineering Report, Corrosion/Cathodic Protection Files Survey, IP2 & IP3, October 2008
SI Project No. 0900271 Site Specific Risk Ranking Report, for Indian Point Underground Piping, Revision A

LIST OF ACRONYMS

ABFP	auxiliary boiler feedwater pump
ADAMS	Agencywide Document Access and Management System
ALARA	as low as is reasonably achievable
AS	Action Statement
ASME	American Society of Mechanical Engineers
CAP	corrective action program
CCR	central control room
CCW	component cooling water
CFR	Code of Federal Regulations
CR	condition report
DRA	Deputy Regional Administrator
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
ED	electronic dosimeter
EDG	emergency diesel generator
ENTERGY	Entergy Nuclear Northeast
FZ	fire zone
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IPEC	Indian Point Energy Center
IR	inspection report
IST	inservice testing
NCV	non-cited violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NSIR	Office of Nuclear Security and Incident Response
NVLAP	National Voluntary Laboratory Accreditation Program
OEDO	Office of the Executive Director for Operations (NRC)
OOS	out of service
PFP	pre-fire plan
PI	performance indicator
PM	preventative maintenance
RA	regional administrator
RCS	reactor coolant system
RHR	residual heat removal
RI	resident inspector
SDE	shallow dose equivalent
SDP	significance determination process
SRI	senior resident inspector
SSC	structure, system, and component
SW	service water
SWP	service water pump
TI	temporary instruction
TIA	task interface agreement
TMOD	temporary modification
TS	Technical Specification
UFSAR	Updated Final Safety Evaluation Report
URI	unresolved item
VHRA	very high radiation area
WO	work order