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In the Matter of:	Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3)
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ENT000427  
Submitted: March 30, 2012



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

May 14, 2009

Mr. Joseph E. Pollock  
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 05000247/2009002

Dear Mr. Pollock:

On March 31, 2009, 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 April 15, 2009, 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 seven findings of very low safety significance (Green). Six of these findings were also determined to be violations of NRC requirements. However, because of their very low safety significance, and because the findings were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a written 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 D.C. 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 characterization of any finding, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator and the NRC Resident Inspectors at Indian Point Nuclear Generating Unit 2. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with Title 10 of the Code of Federal Regulations Part 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 or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Mel Gray, Chief  
Projects Branch 2  
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000247/2009002  
w/ Attachment: Supplemental Information

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Sincerely,

/RA/  
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Projects Branch 2  
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OFFICAL AGENCY RECORD

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 50-247

License No.: DPR-26

Report No.: 05000247/2009002

Licensee: Entergy Nuclear Northeast (Entergy)

Facility: Indian Point Nuclear Generating Unit 2

Location: 450 Broadway, GSB  
Buchanan, NY 10511-0249

Dates: January 1, 2009 through March 31, 2009

Inspectors: G. Malone, Senior Resident Inspector, Indian Point 2  
C. Hott, Resident Inspector, Indian Point 2  
J. Commisky, Health Physics Inspector, Region I

Approved By: Mel Gray, Chief  
Projects Branch 2  
Division of Reactor Projects

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## SUMMARY OF FINDINGS

IR 05000247/2009-002; 01/01/2009 – 03/31/2009; Indian Point Nuclear Generating (Indian Point) Unit 2; Adverse Weather Protection; Fire Protection; Maintenance Effectiveness; Maintenance Risk Assessments; Surveillance Testing; and Radiological Access Control.

This report covered a three-month period of inspection by resident and region based inspectors. Seven findings of very low significance (Green) were identified, six of which were also determined to be non-cited violations (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." The cross-cutting aspect for each finding was determined using IMC 0305, "Operating Reactor Assessment Program." Findings for which the significance determination process (SDP) does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

**Cornerstone: Initiating Events**

- Green. The inspectors identified a NCV of very low safety significance related to 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because Entergy did not promptly identify and correct an adverse condition related to an electrical fault. Specifically, personnel did not identify a safety-related cubicle had experienced an electrical fault prior to replacement of upstream fuses and restoration of power to the damaged cubicle. Entergy entered the issue into the corrective action program as IP2-2009-00342 and IP2-2009-00483, trained all operations personnel on the requirements to replace fuses and re-energize electrical equipment, and plans to revise the operations procedure for operating electrical equipment.

This issue was more than minor because the finding was associated with the external factors attribute of the Initiating Events cornerstone and impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety systems during shutdown as well as power operations. The inspectors determined that the issue increased the likelihood of a fire in the emergency diesel generator (EDG) building. The condition was evaluated by a Senior Reactor Analyst utilizing Phase 2 of IMC 0609 Appendix F, "Fire Protection Significance Determination Process." It was determined that in the event of a fire consuming the MCC, no transient would be placed on the plant and no components required to safely shutdown the plant would be impacted. As a result, in accordance with task 2.3.5 of Appendix F, the issue was screened to Green.

The inspectors determined that a cross-cutting aspect was associated with this finding in the area of human performance related to conservative decision making. Specifically, Entergy's decision-making was non-conservative related to its decisions on the process used to identify the source of the acrid odor; re-energize the damaged electrical equipment; and keep a damaged electrical component energized for 14 days prior to its removal from the MCC. [H.1(b) per IMC 0305] (Section 1R05)

- Green. The inspectors identified a NCV of very low safety significance related to TS 5.4.1, “Administrative Controls: Procedures,” because Entergy did not maintain an adequate maintenance procedure for a safety-related electrical motor control center (MCC). Specifically, the eight-year maintenance procedure for the affected EDG ventilation MCC did not contain an adequate method to identify high resistance connections within the cubicle as was expected in the applicable preventative maintenance industry template. Subsequently, a high resistance connection within the MCC developed into a phase-to-phase electrical fault on January 28, 2009. Entergy entered the issue into the corrective action program, scoped the affected MCC and 21 additional MCCs into the site’s thermography program, and planned to revise the maintenance procedure.

This issue was more than minor because the finding was associated with the external factors attribute of the Initiating Events cornerstone and impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety systems during shutdown as well as power operations. Specifically, the high resistance connection degraded into a phase-to-phase fault and increased the likelihood of a fire in the EDG building. The condition was evaluated by a Senior Reactor Analyst utilizing Phase 2 of IMC 0609 Appendix F, “Fire Protection Significance Determination Process.” It was determined that in the event of a fire consuming the MCC, no transient would be placed on the plant and no components required to safely shutdown the plant would be impacted. As a result, in accordance with task 2.3.5 of Appendix F, the issue was screened to Green.

The inspectors determined that the finding had a cross-cutting aspect associated with the area of problem identification and resolution related to the use of operating experience (OE). Specifically, Entergy personnel did not implement industry recommended practices, or an alternate equivalent method, for identifying high resistance connections in electrical switchgear. [P.2(b) per IMC 0305] (Section 1R12)

#### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified a finding of very low safety significance because Entergy personnel did not adequately implement procedure EN-LI-102, Corrective Action Process, and promptly identify a condition adverse to quality associated with open louvers in a fire protection pump room following pump testing on January 14, 2009. The open louvers resulted in freezing conditions in fire protection piping located in the room and cracked two six-inch header isolation valves on January 17, 2009. Entergy entered the issue into the corrective action program and performed a site-wide extent-of-condition walkdown of louvers.

The finding was more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone and it affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. This finding was evaluated using Phase 1 of IMC 0609 Appendix F, “Fire Protection Significance Determination Process.” The inspectors determined the issue was of very low safety significance (Green) because the cracked valves were easily isolated and did not pass sufficient water to render the fire header non-functional (low degradation rating).



The inspectors determined that the finding had a cross-cutting aspect in the area of human performance related to work practices - human error prevention techniques. Specifically, Entergy personnel that routinely tour the 11 fire pump house did not question the abnormally cold room temperatures. [H.4(a) per IMC 0305] (Section 1R01)

- Green. The inspectors identified a NCV of very low safety significance related to License Condition 2.K., fire protection program, because personnel did not promptly identify and correct a degraded three-hour rated fire door latch mechanism on the west entrance of the 480-Volt switchgear room. Specifically, inspectors identified the fire door in a non-functional state on several instances over the course of a month. Entergy personnel replaced the fire door latch mechanism on March 3, 2009. This issue was entered into the corrective action program as six condition reports spanning several weeks and included an extent of condition walkdown of site fire doors.

The finding was more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. This fire door, when degraded, impacts the reliability of mitigating systems in the 480-Volt switchgear room that are relied upon during a postulated large fire in the turbine building, and vice versa. This finding was evaluated using Phase 1 of IMC 0609 Appendix F, "Fire Protection Significance Determination Process." Since the area in question had a fire watch posted during the time the door was degraded for an unrelated issue, an adequate level of protection was maintained to compensate for the degraded door. As such, according to task 1.3.1, the inspectors determined the finding was Green.

The inspectors determined that the finding had a cross-cutting aspect in the area of problem identification and resolution because Entergy personnel did not thoroughly evaluate a degraded fire door latch on several occasions, such that the resolution of the problems addressed the causes. [P.1(c) per IMC 0305] (Section 1R05)

- Green. The inspectors identified a NCV of very low safety significance related to 10 CFR 50.65(a)(4), because Entergy personnel did not adequately assess the risk associated with the unavailability of the Refueling Water Storage Tank (RWST) level indication during planned maintenance on the level transmitters and instrumentation. Entergy entered the issue into the corrective action program (CR-IP2-2009-00342), updated the risk model to include the maintenance activity, assessed the risk, and appropriately coded the maintenance activity to ensure it would be risk assessed in the future.

The inspectors determined that this finding was more than minor because it was a maintenance risk assessment issue in which personnel did not consider risk significant SSCs that were unavailable during maintenance. The RWST level indication is specifically listed in Table 2 of the plant specific Phase 2 SDP risk-informed inspection notebook. The inspectors determined the significance of this issue in accordance with IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." The inspectors determined that this finding was of very low safety significance because the Incremental Core Damage Probability Deficit was less than 1E-6.

The inspectors determined that the finding had a cross-cutting aspect in the area of human performance related to work control. Specifically, Entergy personnel did not

appropriately plan work activities by incorporating risk insights for affected plant equipment. [H.3(a) per IMC 0305] (Section 1R13)

- Green. The inspectors identified a NCV of very low safety significance related to 10 CFR 50.55a, "Codes and standards," because Entergy's procedure, 2-PT-Q031A for an auxiliary component cooling water pump, did not contain appropriate acceptance criteria for positively determining that safety-related check valves performed their safety function when required in accordance with the American Society of Mechanical Engineers (ASME) OM Code. Specifically, the test used reverse rotation of a parallel pump to verify that the pump's discharge check valve was closed although previous site-specific experience demonstrated that the pump impeller would not rotate backwards when the check valve was stuck open. Entergy entered this issue into their corrective action program as CR-2009-1312.

The inspectors determined that the performance deficiency was greater than minor because it was associated with the procedure quality attribute of the Mitigating System cornerstone and it adversely affected the cornerstone's objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the test criterion used in procedure 2-PT-Q013A did not ensure that valve 755A reliably performed its safety function when tested as demonstrated by testing performed in January 2005. The inspectors determined that the performance deficiency was of very low safety significance (Green) IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings." Specifically, the inspectors determined that this finding was of very low safety significance because the finding did not result in a loss of safety function and did not screen as potentially risk-significant due to external events initiating events.

The inspectors determined the finding had a cross-cutting aspect related to effective corrective actions in the corrective action program component of the problem identification and resolution area. Specifically, Entergy personnel did not implement effective corrective actions to resolve the testing inadequacy since 2005 and during subsequent quarterly testing. [P.1(d) per IMC 0305] (Section 1R22)

#### **Cornerstone: Occupational Radiation Safety**

- Green. The inspectors identified a NCV of very low safety significance related to Technical Specification 5.4.1.a, "Procedures," because Entergy personnel did not generate condition reports or investigation paperwork for multiple high dose-rate alarms as required by station procedures. Specifically, personnel did not generate the required condition reports and adequately document the investigations for six instances of unplanned or un-briefed electronic dosimeter alarms that occurred between January 2009 and March 2009. The performance deficiency resulted in workers receiving unanticipated dose rate alarms with no formally-documented investigation prior to returning to work in a Radiologically Controlled Area. Entergy entered the finding into the corrective action program as condition report CR-IP3-2009-01253 and 01318.

The finding is more than minor because it is associated with the Occupational Radiation Safety cornerstone attribute of programs and process, and adversely affected the objective to ensure adequate protection of worker health and safety from exposure to radiation. Moreover, the inspectors identified a programmatic deficiency to maintain and implement programs to keep exposures as low as reasonably achievable, because

multiple examples were identified regarding the failure to satisfy station radiation protection procedures. Using the Occupational Radiation Safety Significance Determination Process, the inspectors determined that the finding was of very low safety significance (Green) because it did not involve: (1) as low as is reasonably achievable planning and controls, (2) an overexposure of an individual, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose.

The inspectors determined that the finding had a cross-cutting aspect related to procedural adherence in the work practices component of the human performance area. Specifically, Entergy personnel did not follow procedures to generate condition reports and document investigations when high dose-rate alarms were received by workers. [H.4(b) per IMC 0305] (Section 2OS1)

B. Licensee-Identified Violations

None.

## REPORT DETAILS

Summary of Plant Status

Indian Point Nuclear Generating (Indian Point) Unit 2 began the inspection period at full reactor power and remained at or near full power during the quarter.

**1. REACTOR SAFETY****Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity**1R01 Adverse Weather Protection (71111.01 - 1 sample)Impending Adverse Weathera. Inspection Scope

The inspectors reviewed the overall preparations and protection of risk-significant systems for extremely cold weather conditions from January 14 - 19, 2009. The inspectors reviewed and assessed implementation of the site's adverse weather preparation procedures and compensatory measures for the affected conditions before the onset of and during the cold weather conditions. This included verification that operator actions defined in their adverse weather procedure maintain readiness of essential systems that are vulnerable to freezing temperatures. The inspectors verified Entergy personnel implemented periodic equipment walkdowns or other measures to ensure the condition of plant equipment was operable.

The inspectors also reviewed Entergy's corrective action program to review previous issues associated with cold weather preparations and freezing conditions. Documents reviewed are listed in the attachment.

b. Findings

Introduction. The inspectors identified a Green finding because Entergy personnel did not adequately implement procedure EN-LI-102, Corrective Action Process, and promptly identify a condition adverse to quality associated with stuck-open louvers in a fire protection pump room following pump testing on January 14, 2009.

Description. On January 17, 2009, during a period of sustained cold weather which included sub-zero temperatures, control room personnel received a fire panel trouble alarm indicative of a low-pressure condition in the fire header and dispatched a plant operator to investigate. The operator identified spraying water from the body of a ruptured six-inch fire protection valve located in the 11 fire pump house. The operator isolated the broken valve from the fire header by shutting a manually-operated upstream valve which stopped the water spray. In addition, the operator observed that the pump house room was significantly colder than expected and subsequently identified the room's ventilation louvers to the outside were mechanically bound in the open position. The operator disconnected the louver linkage and manually shut the louvers.

On January 21, 2009, the inspectors identified a second six inch valve that was cracked due to the previous cold weather (freezing) conditions in the fire pump house. Entergy personnel entered this issue into the corrective action program and performed site walkdowns to identify additional adverse conditions associated with the cold weather.

The inspectors determined that Entergy did not fully implement Entergy procedure EN-LI-102, Corrective Action Process. Specifically, EN-LI-102 requires plant personnel to identify adverse conditions, including cold-weather related conditions, and then enter them into the CAP for resolution. Attachment 9.2 of the procedure provides examples of adverse conditions expected to be reported; Section 1 of the Attachment contains examples of operational conditions requiring entry into the CAP including "events or conditions that could negatively impact reliability or availability." Additionally, plant operators should have had heightened awareness to cold weather conditions because Entergy procedure OAP-008, "Severe Weather Preparations," requires in step 4.3.7, when freezing conditions are expected, that increased monitoring of plant areas to monitor for adverse effects on plant equipment and verify that adequate protection is provided. Operations personnel did not identify abnormal conditions in the 11 fire pump room that led to the freezing and subsequent rupture of fire protection components.

The inspectors determined it was reasonable for Entergy personnel to identify this issue because operators should have identified that the louvers failed to shut following a routine operations test of 11 fire pump on January 14, 2009. In addition, operators perform tours of the pump house every 12 hours and should have identified the room was much colder than normal.

Analysis. The inspectors identified a performance deficiency because Entergy personnel did not implement procedure guidance and identify stuck open louvers and a subsequent second cracked fire header valve in the 11 fire pump house. The finding was more than minor because it was associated with the protection against external factors attribute of the Mitigating Systems cornerstone and it affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure of the six-inch valves impacted the reliability of the fire header until the ruptured valve was isolated.

This finding was evaluated using Phase 1 of Inspection Manual Chapter (IMC) 0609 Appendix F, "Fire Protection Significance Determination Process." The inspectors determined the issue was of very low safety significance (Green) because the cracked fire valves were easily isolated and did not pass sufficient water to render the fire header non-functional. Specifically, the inspectors assigned a low degradation rating to the fire header because the fire pumps were able to maintain pressure in the fire header until the ruptured valves were isolated.

The inspectors determined that the finding had a cross-cutting aspect in the area of human performance related to work practices - human error prevention techniques. Specifically, Entergy personnel routinely tour the 11 fire pump house did not question the abnormally cold room temperatures. (H.4(a) per IMC 0305)

Enforcement: Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as **FIN 05000247/2009002-01, Failure to Identify Open Louvers in 11 Fire Pump House.**

1R04 Equipment Alignment (71111.04Q - 3 samples)Partial System Walkdownsa. Inspection Scope

The inspectors performed partial system walkdowns to verify the operability of redundant or diverse trains and components during periods of system train unavailability, or following periods of maintenance. The inspectors referenced the system procedures, the UFSAR, and system drawings to verify the alignment of the available train supported its required safety functions. The inspectors also reviewed applicable condition reports (CR) and work orders to ensure Entergy personnel identified and properly addressed equipment discrepancies that could potentially impair the capability of the available train, as required by Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, Criterion XVI, "Corrective Action." The documents reviewed during these inspections are listed in the Attachment.

The inspectors performed a partial walkdown on the following systems, which represented three inspection samples:

- 21 and 22 component cooling water (CCW) system train when 23 CCW pump was tagged out for maintenance;
- City water system as a supply to auxiliary boiler feedwater (ABFW) when the condensate storage tank was declared inoperable due to leakage;
- 21 and 23 ABFW trains when 22 ABFW pump was tagged out and temporary modifications were applied to 21 and 23 ABFW minimum flow lines.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q - 5 samples)a. Inspection Scope

The inspectors conducted tours of several fire areas to assess the material condition and operational status of fire protection features. The inspectors verified, consistent with the applicable administrative procedures, that: combustibles and ignition sources were adequately controlled; passive fire barriers, manual fire-fighting equipment, and suppression and detection equipment were appropriately maintained; and compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with Entergy's fire protection program. The inspectors evaluated the fire protection program for conformance with the requirements of License Condition 2.K. The documents reviewed during this inspection are listed in the Attachment. This inspection represented five inspection samples for fire protection tours, and was conducted in the following areas:

- FZ 65, Main Steam/Feed Regulating Valve Areas;
- FZ 23, 62A Auxiliary Feed Pump Room & Building;
- FZ 14, 480V Vital AC Switchgear Room;
- FZ 10, Emergency Diesel Generator Building; and
- FZ 360, Station Blackout Diesel Area.

b. Findings

.1 Failure to Identify Damaged Components in EDG Ventilation Motor Control Center

Introduction: The inspectors identified a NCV of very low safety significance (Green) related to 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," because Entergy personnel did not promptly identify and correct an adverse condition related to an electrical fault. Specifically, personnel did not identify a safety-related cubicle (bucket) had experienced a fault prior to replacement of upstream fuses and restoration of power to the cubicle.

Description: On January 28, 2009, operations personnel detected an acrid odor coming from the emergency diesel generator (EDG) building. Operators entered the EDG building to investigate the source of the acrid odor and identified that a MCC was de-energized. Operations personnel did not identify external damage to the MCC; however, operators did not open MCC panels to inspect for internal damage. Operators checked the upstream 175 amp supply fuses, located in a different building, and identified that 2 of 3 fuses had blown. Operators opened the downstream breakers on the MCC in the EDG building and then replaced the 175 amp supply fuses in the control building. Once operators replaced the blown fuses, they re-energized the EDG building MCC#1, and subsequently began to locally shut all of the cubicle switches. When operators attempted to shut the switch associated with cubicle 4N, the switch did not function as expected. Operators then opened the panel for cubicle 4N and identified charred electrical components.

Entergy personnel generated a 'D' level condition report (CR) for cubicle 4N on the basis that it supplies a non safety-related (NSR) EDG room heater. Entergy personnel closed the CR to a work request to troubleshoot and repair the NSR heater. However, the inspectors questioned the classification of the MCC and determined that the charred components were safety related (SR). Cubicle 4N contains a SR main line switch and SR 30 amp main line fuses. The 30 amp fuses are SR to isolate the NSR heaters from the MCC in the event of a room heater fault. The inspectors also questioned the appropriateness of leaving the damaged cubicle in the energized MCC. Following inspector questions, Entergy staff issued another CR and removed the damaged cubicle from the MCC on February 11. During removal of the charred cubicle, maintenance personnel were unable to disconnect the main line cables due to arc-welding at the termination and subsequently had to cut two of the three cables upstream of the termination and cubicle switch. These cables and the line side of the switch were energized from January 28 until February 11. After the damaged cubicle was removed, engineering personnel performed an inspection and determined that the fault originated from a high resistance connection on the 'C' phase between the main fuse clip and the cubicle supply switch in the 4N cubicle.

The inspectors determined that replacing the upstream 175 Amp fuses on and restoring power to the EDG ventilation MCC #1, which contained the charred 4N cubicle, without identifying the source of the acrid odor could have reinitiated the fault and increased the probability of a fire. In addition, operations personnel tried to locally close the damaged switch which could have also re-initiated the fault. Entergy staff also did not take action to remove or de-energize the charred cubicle after the condition was identified on January 28, 2009. The damaged cubicle was de-energized and removed from the MCC on February 11 in response to the inspectors' questions.

This issue was reasonable for the licensee to foresee and correct because acrid odor is an indication of a fault. It was reasonable for Entergy personnel to open panel doors and perform visual inspections of the affected MCC prior to replacing upstream fuses and restoring power to the fault. The inspectors determined that the National Electrical Code NFPA 70E, "Standard for Electrical Safety in the Workplace," prohibits reenergizing a circuit after a protective device has operated until it has been determined that the automatic operation was a result of an overload and not a fault. The acrid odor in the EDG building was an indication of a fault vice an overload condition. In addition, once Entergy personnel identified the cubicle was charred and experienced an electrical fault, industry standards would have operators immediately secure power and/or remove the damaged gear from the MCC.

Entergy entered the issue into the corrective action program as IP2-2009-00342 and IP2-2009-00483, trained all operations personnel on the requirements to replace fuses and re-energize electrical equipment, and plans to review operations procedures for operating electrical equipment.

Analysis: The inspectors determined that Entergy's failure to promptly identify an adverse condition associated with damaged electrical components constituted a performance deficiency. This issue was more than minor because the finding was associated with the external factors attribute of the Initiating Events cornerstone and impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety systems during shutdown as well as power operations. Specifically, operations personnel did not identify the source of the acrid odor, indicative of an electrical fault, in the EDG building; re-energized damaged electrical equipment; and left damaged electrical components (cubicle 4N) energized for 14 days prior to its removal from the MCC. The inspectors determined these issues increased the likelihood of a fire in the EDG building. The condition was evaluated by a Senior Reactor Analyst utilizing Phase 2 of IMC 0609 Appendix F, "Fire Protection Significance Determination Process." It was determined that in the event of a fire consuming the MCC, no transient would be placed on the plant and no components required to safely shutdown the plant would be impacted. As a result, in accordance with task 2.3.5 of Appendix F, the issue was screened to Green.

The inspectors determined that a cross-cutting aspect was associated with this finding in the area of human performance related to conservative decision making. Specifically, Entergy's decision-making was non-conservative as it related to the processes used to identify the source of the acrid odor; re-energize the damaged electrical equipment; and keep a damaged electrical component energized for 14 days prior to its removal from the MCC. (H.1(b) per IMC 0305)

Enforcement: 10 CFR 50 Appendix B, Criterion XVI, "Corrective Action," requires that measures shall be established to assure conditions adverse to quality, such as failures and malfunctions are promptly identified and corrected. Contrary to the above, on January 28, 2009, operations personnel did not identify that a safety-related bucket had experienced a fault prior to replacing upstream fuses and restoring power to the bucket. In addition, after replacing the upstream fuses, operations personnel tried to locally shut the damaged cubicle switch and left damaged equipment energized until February 11, 2009. Entergy entered the issue into the corrective action program as IP2-2009-00342 and IP2-2009-00483, trained all operations personnel on the requirements to replace fuses and re-energize electrical equipment, and plans to review operations procedures



for operating electrical equipment. Because the violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy: **NCV 05000247/2009002-02, Failure to Identify Damaged Components in EDG Ventilation Motor Control Center.**

.2 Degraded Fire Door to the 480V Vital Bus Room

Introduction: The inspectors identified a NCV of very low safety significance (Green) related to License Condition 2.K., fire protection program, because Entergy personnel did not promptly identify and correct a degraded three-hour rated fire door on the west entrance of the 480 Volt switchgear room.

Description: License Condition 2.K., fire protection program, requires that Entergy implement and maintain in effect all provisions of the NRC-approved fire protection program, as approved in part by the NRC Safety Evaluation Report (SER) dated January 31, 1979. The January 31, 1979, SER requires administrative controls comparable to those described in NRC Branch Technical Position 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976." Branch Technical Position (BTP) 9.5-1 requires that measures be established to assure that conditions adverse to fire protection, such as deficiencies, deviations, defective components, and non-conformities are promptly identified, reported, and corrected.

On February 6, 2009, the inspectors performed a fire protection walkdown of the 480-Volt switchgear room. The inspectors noted the three-hour rated, swing-type fire door on the west side of the 480-Volt switchgear room was not latched closed. The inspectors observed the door being held open by the latch mechanism which had not repositioned to allow the door to shut. The inspectors observed the latch mechanism did not move freely preventing the door from shutting automatically. The inspectors shut the door and notified shift operations personnel who tightened latch screws on the door and wrote a condition report.

On February 18, the inspectors identified the 480-Volt switchgear room door was not latched shut again. The inspectors determined the door could not be closed due to interference from the latch mechanism screw which had backed out. The inspectors notified operations of the fire door issue. Operations personnel re-inserted the latch mechanism screw and documented the issue in a condition report. The inspectors questioned whether it was appropriate to re-insert a screw that had backed out on its own in such a short period of time. Entergy personnel subsequently inspected the door on February 23 and identified the screws holding the latch mechanism to the door were stripped. Entergy personnel tapped new holes in the door latch mechanism and installed new screws.

On March 3, inspectors identified the 480-Volt switchgear room fire door not latched shut again. The inspectors observed the door was being held open by the latch mechanism which had not repositioned to allow the door to shut. The inspectors noted the latch mechanism did not move freely preventing the door from shutting automatically. The inspectors notified operations personnel of the non-functioning fire door and Entergy subsequently had a locksmith inspect the latch. The locksmith installed a new latch mechanism on March 3 and determined the latch issues observed were age-related due to interaction of wear products from the latch interfering with the moving portions of the latch, as a result of latching and unlatching door operations.

Entergy entered the issue into the corrective action program on March 3, performed an inspection of all fire doors onsite, and identified and corrected issues with other required fire doors.

Analysis: The inspectors identified a performance deficiency because Entergy personnel did not identify and correct the non-functional fire door. The finding was more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, in the event of a large fire in the 480-Volt switchgear room or the turbine building, the affected fire door is credited to prevent the spread of fire from one area to the other area. This fire door, when degraded, impacts the reliability of mitigating systems in the 480-Volt switchgear room that are relied upon during a large fire in the turbine building, and vice versa.

This finding was evaluated using Phase 1 of IMC 0609 Appendix F, "Fire Protection Significance Determination Process." Since the area in question had a fire watch posted during the time the door was degraded, an adequate level of protection was maintained to compensate for the degraded door and resulted in the finding being of very low safety significance. As such according to task 1.3.1, the inspectors determined the finding was Green.

The inspectors determined that the finding had a cross-cutting aspect in the area of problem identification and resolution because Entergy personnel did not thoroughly evaluate a degraded fire door latch on several occasions, such that the resolution of the problems addressed the causes. (P.1(c) per IMC 0305)

Enforcement: License Condition 2.K., fire protection program, requires that Entergy implement and maintain in effect all provisions of the NRC-approved fire protection program, as approved in part by the NRC Safety Evaluation Report (SER) dated January 31, 1979. The January 31, 1979, SER requires administrative controls comparable to those described in NRC Branch Technical Position 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976." Branch Technical Position 9.5-1 requires that measures be established to assure that conditions adverse to fire protection, such as deficiencies, deviations, defective components, and non-conformities are promptly identified, reported, and corrected.

Contrary to the above, Entergy personnel did not promptly identify and then subsequently correct the non-functional 480-Volt switchgear fire door. This fire door was identified by inspectors in a non-functional state on February 6, February 18, and again on March 3, 2009. Entergy entered the issue into the corrective action program as IP2-2009-00526, IP2-2009-00680, IP2-2009-00709, IP2-2009-00834, IP2-2009-00842, and IP2-2009-00843. Because the violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy: **NCV 05000247/2009002-03, Failure to Identify and Promptly Correct Degraded 480-Volt Switchgear Room Fire Door.**

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

a. Inspection Scope

The inspectors selected the 22 component water heat exchanger for review to determine the heat exchanger's readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component, reviewed Entergy commitments to NRC Generic Letter 89-13, and reviewed engineering reports that documented results of previous internal inspections. The inspectors also observed the disassembly, inspection, and cleaning of the heat exchanger and reviewed engineering results of the inspection to verify that appropriate corrective actions were initiated for deficiencies that were discovered. The inspectors reviewed documents for and verified that the amount of tubes plugged within the heat exchanger did not exceed the maximum amount allowed. Documents reviewed are listed in the appendix.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

Quarterly Review (71111.11Q – 1 sample)

a. Inspection Scope

On February 23, 2009, the inspectors observed licensed operator simulator training associated with a sustained loss of all alternating current (AC) power scenario, to verify that operator performance was adequate, and that evaluators were identifying and documenting crew performance problems. The inspectors evaluated the performance of risk-significant operator actions, including the use of emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, the implementation of appropriate actions in response to alarms, the performance of timely control board operation and manipulation, and the oversight and direction provided by the control room supervisor. The inspectors also reviewed simulator fidelity with respect to the actual plant. The inspectors evaluated licensed operator training for conformance with the requirements of 10 CFR Part 55, "Operator Licenses." The documents reviewed during this inspection are listed in the Attachment. This observation of operator simulator training represented one inspection sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q - 3 samples)

a. Inspection Scope

The inspectors reviewed performance-based problems that involved structures, systems, and components (SSCs) to assess the effectiveness of maintenance activities. When applicable, the reviews focused on:

- Proper Maintenance Rule scoping in accordance with 10 CFR 50.65;
- Characterization of reliability issues;
- Changing system and component unavailability;

- 10 CFR 50.65(a)(1) and (a)(2) classifications;
- Identifying and addressing common cause failures;
- Trending of system flow and temperature values;
- Appropriateness of performance criteria for SSCs classified (a)(2); and
- Adequacy of goals and corrective actions for SSCs classified (a)(1).

The inspectors also reviewed system health reports, maintenance backlogs, and Maintenance Rule basis documents. The inspectors evaluated maintenance effectiveness and monitoring activities against the requirements of 10 CFR 50.65. The documents reviewed during this inspection are listed in the Attachment. The following Maintenance Rule samples were reviewed and represented three inspection samples:

- RWST level indication system;
- EDG fuel injection system; and
- 480-Volt switchgear system.

b. Findings

Introduction: The inspectors identified a NCV of very low safety significance (Green) related to TS 5.4.1, "Administrative Controls: Procedures," because Entergy did not maintain an adequate maintenance procedure for a safety-related electrical motor control center (MCC). Specifically, the eight-year maintenance procedure for the affected EDG ventilation MCC did not contain an adequate method to identify high resistance connections within the cubicle.

Description: On January 28, 2009, operations personnel identified an acrid odor coming from the EDG building. Subsequent personnel investigation revealed a charred cubicle in a safety-related 480-Volt MCC. Specifically, cubicle 4N, in the EDG ventilation MCC, experienced a phase-to-phase fault that caused the upstream 175 amp fuses to open and de-energize the MCC. Entergy personnel subsequently generated a condition report (CR) that was closed to a work request to troubleshoot and repair the cubicle.

Entergy personnel removed the damaged cubicle from the MCC on February 6 and determined the likely cause to be a high-resistance connection between the cubicle switch and 30 amp fuse clip on the 'C' phase resulting in long-term overheating. This overheating condition degraded the insulation between two of the three phases over time and eventually resulted in a phase-to-phase fault on January 28, 2009.

The inspectors reviewed the 8-year maintenance procedure 2-MCC-003-ELC, "Klockner-Moeller, Series 200, 480 Volt Motor Control Center Preventive Maintenance," which was performed on the affected EDG ventilation MCC on April 6, 2008. The inspectors noted that the procedure was revised the same day to allow performance of the maintenance without de-energizing the equipment. The revision resulted in portions of the cubicle cleaning and inspection procedure not being performed because they could not be safely performed while the cubicle was energized. The inspectors determined that the procedure revision on April 6, 2008, was inappropriately treated as an editorial revision without a technical evaluation of the change performed. In addition, following interviews with Entergy personnel, it was determined that maintenance had not been performed on this MCC prior to April 6, 2008.

The inspectors reviewed industry guidance for performing switchgear maintenance and determined that Entergy did not include standard maintenance practices typically utilized by its staff that would have identified a high resistance connection in the cubicle. Specifically, continuity checks across contacts and switches were not performed, fuse clip tensions and tightness were not performed, and all terminations could not be checked due to the decision to perform the maintenance with portions of the cubicle energized. In addition, the inspectors determined the EDG ventilation MCCs were not included in Entergy's thermography program, contrary to Entergy corporate preventive maintenance templates. The inspectors determined that not performing thermography on the EDG ventilation MCC constituted a missed opportunity to identify the high resistance condition.

It is reasonable to consider the high resistance connection existed during the maintenance performed on April 6, 2008, because high resistance connections do not develop into phase-to-phase faults over a short period of time. This is an underlying assumption for performing switchgear maintenance, which is intended to identify and correct loose/high resistance connections, on an eight-year periodicity. In addition, Entergy's corporate template for switchgear maintenance recommends a six-year periodicity and thermography every year. It is reasonable to expect Entergy to be aware of the existing industry guidance as well as the Entergy corporate maintenance templates.

Entergy entered the issue into the CAP as IP2-2009-00342 and IP2-2009-00483, scoped the EDG ventilation MCC into the existing thermography program, performed an extent-of-condition review that identified 21 additional panels that should be in the thermography program, and plans to revise the maintenance procedure.

Analysis: The inspectors identified a performance deficiency because Entergy did not maintain an adequate maintenance procedure for the safety-related EDG ventilation MCC. This issue was more than minor because the finding was associated with the external factors attribute of the Initiating Events cornerstone and impacted the initiating events cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety systems during shutdown as well as power operations. Specifically, the high resistance connection degraded into a phase-to-phase fault and increased the likelihood of a fire in the EDG building. The condition was evaluated by a Senior Reactor Analyst utilizing Phase 2 of IMC 0609 Appendix F, "Fire Protection Significance Determination Process." It was determined that in the event of a fire consuming the MCC, no transient would be placed on the plant and no components required to safely shutdown the plant would be impacted. As a result, in accordance with task 2.3.5 of Appendix F, the issue was screened to Green.

The inspectors determined that the finding had a cross-cutting aspect associated with the area of problem identification and resolution related to the use of operating experience (OE). Specifically, Entergy personnel did not implement industry recommended practices, or an alternate equivalent method, for identifying high resistance connections in electrical switchgear. (P.2(b) per IMC 0305)

Enforcement. TS 5.4.1 Administrative Controls: Procedures, states, "Written procedures shall be established, implemented, and maintained covering the requirements and recommendations of Appendix A of Regulatory Guide (RG) 1.33, Revision 2." Appendix A of RG 1.33 requires procedures for maintenance activities that

can affect the performance of safety related equipment. Contrary to the above, Entergy did not maintain a maintenance procedure for a safety-related MCC cubicle. Specifically, the eight-year maintenance procedure, first performed on April 6, 2008, did not contain an adequate method to identify and correct high resistance connections in the cubicle. Entergy entered the issue into the CAP as IP2-2009-00342 and IP2-2009-00483. Because the violation was of very low safety significance and it was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy: **NCV 05000247/2009002-04, Inadequate Maintenance Procedure for EDG Ventilation Motor Control Center.**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 6 samples)

a. Inspection Scope

The inspectors reviewed scheduled and emergent maintenance activities to verify the appropriate risk assessments were performed prior to removing equipment from service for maintenance or repair. The inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified the plant risk was promptly reassessed and managed. Documents reviewed during this inspection are listed in the Attachment. The following activities represented six inspection samples:

- Emergent maintenance on the 22 EDG lube oil pump during the 23 EDG maintenance outage;
- Planned risk during 21 auxiliary boiler feedwater (ABFW) pump outage and reactor protection system testing;
- Unplanned elevated risk condition due to delayed work on reactor protection system components during planned maintenance of 22 ABFW pump;
- Planned maintenance on a reactor water storage tank level indicator;
- Planned maintenance on the 22 ABFW pump while temporary modifications were applied to the 21 and 23 ABFW pumps; and
- Planned risk during 23 EDG testing and maintenance.

b. Findings

Introduction: The inspectors identified a NCV of very low safety significance (Green) related to 10 CFR 50.65(a)(4) because Entergy staff did not adequately assess the risk associated with the unavailability of the Refueling Water Storage Tank (RWST) level indication during planned maintenance on the level transmitters and instrumentation.

Description: On February 6, 2009, Entergy staff performed maintenance on the RWST level indication system. The inspectors identified that the online risk assessment did not consider planned maintenance on the RWST level indication, as required by 10 CFR 50.65(a)(4). The inspectors reviewed the work activity and noted the maintenance scheduling software used by Entergy did not have the RWST maintenance coded as a risk-significant activity. Entergy's maintenance planning process prompts the organization to evaluate the risk impact of all maintenance activities coded as risk-significant. Therefore, a risk assessment was not performed for the quarterly RWST level indication maintenance as required. In addition, the RWST level indication was not represented in Entergy's interactive risk model. Entergy staff subsequently updated the risk model to include the RWST level indication and subsequently assessed the online

risk for the maintenance which resulted in a measurable increase in the core damage frequency (CDF). The increase in CDF was not large enough to require entrance into the higher risk category per Entergy procedures. In addition, the increase in CDF (1.1E-6) combined with the limited duration of the maintenance (15 hours) resulted in a relatively small incremental core damage probability deficit (1.9E-9).

The inspectors determined this same maintenance activity is modeled in the Indian Point Unit 3 risk model. Entergy entered the issue into the corrective action program (CR-IP2-2009-00342), updated the risk model to include the maintenance activity, assessed the risk, and appropriately coded the maintenance activity to ensure it would be risk assessed in the future.

Analysis: The inspectors identified a performance deficiency in that Entergy staff did not assess the increase in plant risk resulting from planned maintenance activities on RWST level instrumentation as required by 10 CFR 50.65(a)(4). The inspectors determined that this finding was more than minor because it was a risk assessment issue in which Entergy personnel did not consider risk significant SSCs that were unavailable during maintenance. Specifically, RWST level indication is included in Table 2 of the plant specific Phase 2 SDP risk-informed inspection notebook. The inspectors assessed the significance of this issue in accordance with IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." The inspectors determined that this finding was of very low safety significance (Green) because the incremental core damage probability deficit was less than 1E-6.

The inspectors determined that the finding had a cross-cutting aspect in human performance related work control. Specifically, Entergy personnel did not appropriately plan work activities by incorporating risk insights for affected plant equipment. (H.3(a) per IMC 0305)

Enforcement: 10 CFR 50.65 (a)(4) states, in part that licensees shall assess and manage the increase in risk that may result from the proposed maintenance activities before performing those activities. Contrary to the above, on February 6, 2009, Entergy performed maintenance on the RWST level indication system without assessing the increase in risk. Entergy entered the issue into the corrective action program (CR-IP2-2009-00342. Because this issue is of very low safety significance and is entered into Entergy's corrective action program, this violation is being treated as an NCV consistent the NRC Enforcement Policy: **NCV 05000247/2009002-05, Failure to Include RWST Level Maintenance In Online Risk Assessment.**

#### 1R15 Operability Evaluations (71111.15 - 7 samples)

##### a. Inspection Scope

The inspectors reviewed operability evaluations to assess the acceptability of the evaluations, the use and control of compensatory measures when applicable, and compliance with Technical Specifications. The inspectors' reviews included verification that operability determinations were performed in accordance with procedure ENN-OP-104, "Operability Determinations." The inspectors assessed the technical adequacy of the evaluations to ensure consistency with the Technical Specifications, UFSAR, and associated design basis documents. The documents reviewed are listed in

the Attachment. The following operability evaluations were reviewed and represented seven inspection samples:

- Proximity of 480-Volt vital motor control center to an uninsulated steam line;
- Leakage from condensate storage tank (CST) return piping;
- Impacts of scaffolding built in the vicinity of the 21 and 22 component cooling water heat exchangers;
- Impact on pressurizer surge line and reactor coolant system piping while performing reactor plant startups and shutdowns due to thermal transients;
- Performance impact on the 21 and 22 auxiliary component cooling pumps (ACCPs) with respect to a potential hydraulic lock-out condition of the 21 ACCP due to 22 ACCP larger impeller size;
- Mechanical failure of a grease fitting on 21 service water pump; and
- Low temperatures in condensate storage tank volume.

b. Findings

No findings of significance were identified. With respect to the CST return piping, the inspectors determined Entergy operators maintained the CST aligned to supply water to the AFW pumps. The inspectors concluded the leakage did not prevent the CST from fulfilling its safety function. Specifically, design features of the CST and the elevation of the return line relative to the leak location provided assurance that, in the event the CST return line leak increased significantly, the CST water volume would have been maintained above TS minimum required water level and able to supply the required water to the auxiliary feedwater system.

1R18 Plant Modifications (71111.18 - 2 samples)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed one temporary plant modification package for securing minimum flow lines on the motor driven auxiliary boiler feedwater pumps (ABFPs) and controlling the operation on the ABFPs through a temporary operating procedure during repairs of the CST return piping. The inspectors verified the design bases, licensing bases, and performance capability of the system was not degraded by the temporary modification. The inspectors' review included Entergy's engineering evaluation for determining the ABFPs could start with the pump's required minimum flow being achieved through the internal thrust balance lines while the minimum flow lines were isolated. In addition, the inspectors interviewed plant staff, and reviewed issues entered into the corrective action program to determine whether Entergy had been effective in identifying and resolving problems associated with the temporary modification. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.



.2 Permanent Modifications

a. Inspection Scope

The inspectors reviewed modification documents associated with the installation of an additional nitrogen backup power supply for the 21- 24 steam generator atmospheric dump valves. The inspector verified that the modification was reviewed adequately to verify the modification conformed to design criteria and did not interfere or invalidate previous design assumptions or functions. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 6 samples)

a. Inspection Scope

The inspectors reviewed post-maintenance test procedures and associated testing activities for selected risk-significant mitigating systems, and assessed whether the effect of maintenance on plant systems was adequately addressed by control room and engineering personnel. The inspectors verified that: test acceptance criteria were clear, the test demonstrated operational readiness and were consistent with design basis documentation; test instrumentation had current calibrations, and appropriate range and accuracy for the application; and the tests were performed as written, with applicable prerequisites satisfied. Upon completion of the tests, the inspectors verified that equipment was returned to the proper alignment necessary to perform its safety function. Post-maintenance testing was evaluated for conformance with the requirements of 10 CFR 50, Appendix B, Criterion XI, "Test Control." The documents reviewed are listed in the Attachment. The following post-maintenance activities were reviewed and represented six inspection samples:

- Replacement of SG 23 pressure indicator PI-1355;
- 22 component cooling water heat exchanger following maintenance;
- 21 charging pump following recirculation valve maintenance;
- Condensate storage tank return line following pipe section replacement;
- Emergency diesel generator air compressor following quarterly maintenance; and
- 23 emergency diesel generator following quarterly engine maintenance.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 6 samples)

a. Inspection Scope

The inspectors observed performance of portions of surveillance tests and/or reviewed test data for selected risk-significant SSCs to assess whether they satisfied Technical Specifications, UFSAR, Technical Requirements Manual, and Entergy procedure

requirements. The inspectors verified that: test acceptance criteria were identified, demonstrated operational readiness, and were consistent with design basis documentation; test instrumentation had accurate calibration, and appropriate range and accuracy for the application; and tests were performed as written, with applicable prerequisites satisfied. Following the tests, the inspectors verified that the equipment was capable of performing the required safety functions. The inspectors evaluated the surveillance tests against the requirements in Technical Specifications. The documents reviewed during this inspection are listed in the Attachment. The following surveillance tests were reviewed and represented six inspection samples:

- 2-PT-Q031A, 21 Auxiliary Component Cooling Pump In-Service Test;
- 2-PT-Q054, Pressurizer Level Bistables;
- 2-PT-Q013 DS027, IST Valve Test of 888A (Safety Injection Pump Suction from Residual Heat Removal heat Exchanger);
- 2-PT-2M4, Safety Injection System Train “A” Actuation Logic and Master Relay Test;
- 2-PT-Q030C, 23 Component Cooling Water Pump; and
- 0-SOP-LEAKRATE-001, RCS Leakrate Surveillance, Evaluation, and Leak Identification.

b. Findings

Introduction. The inspectors identified a NCV of very low safety significance (Green) related to 10 CFR 50.55a, “Codes and standards,” because Entergy’s procedure 2-PT-Q031A did not contain appropriate acceptance criteria for determining that safety-related check valves performed their safety function when required in accordance with the American Society of Mechanical Engineers (ASME) OM Code.

Description. Entergy procedure 2-PT-Q031A, “21 Auxiliary Component Cooling Pump (ACCP)”, is an In-Service Test (IST) procedure that demonstrates the operability of the 21 ACCP, the pump bypass line check valve (755), the 21 ACCP discharge check valve (755B), and the 22 ACCP discharge check valve (755A) in accordance with Technical Specification (TS) 5.5.6, Inservice Testing Program.

The test established a single acceptance criterion to determine if the discharge check valve on the 22 ACCP train shuts when the parallel train’s 21 ACCP is providing design flow. The acceptance criterion was that no reverse rotation is observed on the 22 ACCP. Although NUREG-1482, “Guidelines for Inservice Testing at Nuclear Power Plants” identifies the methodology of using reverse pump rotation as an acceptable means of testing, Entergy’s site-specific experience in 2005 demonstrated this particular method was not effective to maintain the ACCP discharge check valve safety function. Specifically, when 2-PT-Q031A was performed on January 19, 2005, the 21 ACCP failed the performance test because check valve 755A was determined to be in the open position. However, the 22 ACCP did not rotate in the reverse direction. Following disassembly of valve 755A, engineers determined the valve remained in the open position because of excessive clearances between the hinge pin and hinge pin bushings. Entergy personnel determined the check valve was likely in this condition following maintenance on the valve in late 2004. CR-IP2-2005-0252 was written to document and evaluate the issue. The issue was previously documented in LER 05000247/2005001-00 and NRC NCV 50-247/2005003-01. At that time, Entergy personnel concluded the test criteria established in 2-PT-Q031A was acceptable but that post-maintenance tests on the check valve should include amplifying comments

directing the performance of the IST following maintenance. Entergy personnel concluded that the IST was adequate because the low pump head that caused the pump performance test to fail led to troubleshooting that identified that check valve 755A was stuck open.

The inspectors determined that the criterion for determining operability of 755A in test 2-PT-Q013A was inadequate because the criterion in the procedure previously failed to identify that 755A remained in the open position in January 2005 and 2-PT-Q013A does not identify any other criteria, including using pump head, to determine operability of 755A. Additionally, the inspectors determined the test criterion for check valve 755A and 755B were not consistent with the following ASME Code requirements:

- The ASME OM Code 2001 Subsection ISTA-3160 states that “procedures shall contain the Owner-specified reference values and acceptance criteria”;
- The ASME OM Code 2001 Subsection ISTC-1400 (c) states “it is the Owner’s responsibility to ensure that the application, method, and capability of each nonintrusive technique is qualified”; and
- The ASME OM Code 2001 Subsection ISTC-3530 states “obturator movement shall be determined by exercising the valve while observing an appropriate indicator.”

Analysis. The inspectors determined that the performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating System cornerstone and adversely affected the cornerstone objective to ensure the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the test criterion used in procedure 2-PT-Q013A did not ensure that valve 755A reliably performed its safety function when tested as demonstrated by testing performed in January 2005. The inspectors determined that the performance deficiency was of very low safety significance (Green) using IMC 0609, Attachment 4, “Phase 1 – Initial Screening and Characterization of Findings.” Specifically, the inspectors determined that this finding was of very low safety significance because the finding did not result in a loss of safety function and did not screen as potentially risk-significant due to external events initiating events.

The inspectors determined the finding had a cross-cutting aspect related to effective corrective actions in the corrective action program component of the problem identification and resolution area. Specifically, Entergy did not implement effective corrective actions to resolve the testing inadequacy since 2005 during subsequent quarterly testing. Additionally, the issue was considered to be indicative of current performance because personnel when initially responding to inspector questions concluded the acceptance criteria were adequate. (P.1(d) per IMC 0305)

Enforcement. 10 CFR 50.55a, “Codes and standards,” states that pumps and valves which are classified as ASME code Class 1, Class 2, and Class 3 must meet the inservice test requirements set forth in the ASME OM Code (2001 edition for Indian Point Unit 2). Furthermore, inservice tests to verify operational readiness of pumps and valves, whose function is required for safety must comply with the requirements of the ASME OM Code. The ASME OM Code 2001 Subsection ISTC-1400 (c) states “it is the Owner’s responsibility to ensure that the application, method, and capability of each nonintrusive technique is qualified.” In addition, the ASME OM Code 2001 Subsection ISTC-3530 states “obturator movement shall be determined by exercising the valve

while observing an appropriate indicator.” Contrary to the above, from February 2005 until February 2009, Entergy procedure 2-PT-Q031A, did not include appropriate acceptance criteria for demonstrating operability of valve 755A. Specifically, the test did not utilize a qualified technique for testing the check-valve and did not verify check valve movement by observing an appropriate indicator. Because ACCP performance tests since 2004 demonstrated satisfactory performance of the ACCPs at design flows, no actual impact to the operability of the ACCPs was evident. Because this violation was of very low safety significance and it was entered into Entergy’s corrective action program (IP2-2009-1312), this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **NCV 2009002-06, Inadequate Test Acceptance Criteria for Auxiliary Component Cooling Check Valves.**

### **Cornerstone: Emergency Preparedness (EP)**

#### 1EP6 Drill Evaluation (71114.06 - 1 sample)

##### a. Inspection Scope

The inspectors evaluated an emergency classification conducted on February 23, 2009, during a licensed-operator requalification simulator training evaluation. The inspectors observed an operating crew in the simulator respond to various, simulated initiating events that ultimately resulted in the simulated implementation of the emergency plan. In particular, the inspectors verified the adequacy and accuracy of the simulated emergency classification of a Site Area Emergency. While other simulated classifications were made, the inspectors verified that the initial classification was appropriately credited as an opportunity toward NRC performance indicator data. The inspectors observed the management evaluator and training critique following termination of the scenarios, and verified that significant performance deficiencies were appropriately identified and addressed within the critique and the corrective action program. Also, the inspectors reviewed the summary performance report for the evaluation and verified that appropriate attributes of drill performance including deficiencies were captured. This evaluation constituted one inspection sample.

##### b. Findings

No findings of significance were identified.

## **2. RADIATION SAFETY**

### **Cornerstone: Occupational Radiation Safety (OS)**

#### 2OS1 Access Control to Radiologically Significant Areas (71121.01 - 16 samples)

##### a. Inspection Scope

From March 23 through March 27, 2009, the inspectors conducted the following activities to verify that Entergy was properly implementing physical, engineering, and administrative controls for access to high radiation areas, and other radiologically controlled areas, and that workers were adhering to these controls when working in these areas. Implementation of the access control program was reviewed against the

criteria contained in 10 CFR 20, site technical specifications, and Entergy's procedures required by the Technical Specifications as criteria for determining compliance.

This inspection activity represents completion of sixteen (16) samples relative to this inspection area. The inspector performed independent radiation dose rate measurements and reviewed the following items:

#### Plant Walk Downs and Radiological Work Permit Reviews

- (1) Exposure significant work areas were identified by inspectors for review within radiation areas, high radiation areas, and airborne areas in the plant. Associated licensee controls and surveys were review for adequacy. Work reviewed included: Refuel Floor Split Pin and Reactor Head Inspections, Refuel Floor Lower Internals Removal and Installation, Refuel Floor and Fuel Support Building Fuel Transport Equipment Repairs requiring an underwater diver, Reactor Coolant Pump work including RCP #31 Impeller replacement, Containment valve work including Pressurizer Safety Valves, Various Containment and Auxiliary Building activities.
- (2) With a survey instrument and assistance from a health physics technician, inspectors walked down the above mentioned areas to determine: whether the radiation work permits (RWPs), procedures and engineering controls were in place and whether surveys and postings were adequate.
- (3) The inspectors reviewed RWPs that provide access to exposure significant areas of the plant including high radiation areas. Specified electronic personal dosimeter alarm set points were reviewed with respect to current radiological condition applicability and workers were queried to verify their understanding of plant procedures governing alarm response and knowledge of radiological conditions in their work area.
- (4) There were no radiation work permits for airborne radioactivity areas with the potential for individual worker internal exposures of >50 mrem CEDE.
- (5) There were no internal dose assessments that resulted in actual internal exposures greater than 50 mrem CEDE. Internal assessments were reviewed to determine adequacy and assurance that they were not in fact equal to or greater than 50 mrem CEDE.

#### Problem Identification and Resolution

- (6) Access controls related condition reports were reviewed since the last inspection in this area. Staff members were interviewed and documents reviewed to determine that follow-up activities are being conducted in an effective and timely manner, commensurate with their safety and risk.
- (7) For repetitive deficiencies or significant individual deficiencies in problem identification and resolution, the inspectors determined if the licensee's assessment activities were also identifying and addressing these deficiencies.
- (8) A review of events revealed no performance indicator occurrences that involved dose rates greater than 25 Rem/hour at 30 cm, dose rates greater than

500 Rem/hour at 1 meter, or unintended exposures greater than 100 mrem TEDE (or greater than 5 Rem SDE or greater than 1.5 Rem LDE)

#### Job-in-Progress Reviews

- (9) The inspectors observed aspects of various on-going activities to confirm that radiological controls, such as required surveys, area postings, job coverage, and job site preparations were conducted. The inspectors verified that personnel dosimetry was properly worn and that workers were knowledgeable of work area conditions. The inspectors attended pre-planning meetings for work described earlier in the report.
- (10) Underwater diving activities associated with repairs to the fuel transport system were reviewed for adequacy. Dosimetry requirements, bioassay requirements, and controls were reviewed.

#### High Risk Significant, High Dose Rate High Radiation Areas (HRA) and Very HRA Controls

- (11) Keys to locked and very HRA were reviewed for their controls and proper inventory. Accessible locked HRA were verified to be properly secured and posted during plant tours.
- (12) The inspectors discussed with Radiation Protection supervision the adequacy of high dose rate HRA controls and procedures and verified that no programmatic or procedural changes have occurred that reduce the effectiveness and level of worker protection.

#### Radiation Worker Performance

- (13) During observation of the work activities listed above, radiation worker performance was evaluated with respect to the specific radiation protection work requirements and their knowledge of the radiological conditions in their work areas.
- (14) The inspectors reviewed condition reports, related to radiation worker performance to determine if an observable pattern traceable to a similar cause was evident.

#### Radiation Protection Technician Proficiency

- (15) During observation of the work activities listed above, radiation protection technician work performance was evaluated with respect to their knowledge of the radiological conditions, the specific radiation protection work requirements and radiation protection procedures.
- (16) The inspectors reviewed condition reports, related to radiation worker performance to determine if an observable pattern traceable to a similar cause was evident.

b. Findings

Introduction. The inspectors identified a NCV of very low safety significance (Green) related to Technical Specification 5.4.1.a, "Procedures," because Entergy personnel did not generate condition reports or investigation paperwork for multiple high dose-rate alarms as required by station procedures. Specifically, personnel did not generate the required condition reports and adequately document the investigations for six instances of unplanned or un-briefed electronic dosimeter alarms received by individuals in the Unit 2 radiologically controlled area (RCA) that occurred between January 2009 and March 2009.

Description. During the period January 2009 through March 2009, six instances of electronic dosimeter dose rate alarms were recorded by the access control system for Unit 2 personnel in the RCA (Unit 3 had 15 instances). During this period, Entergy personnel inconsistently utilized an informal process of reviewing the alarms without a full investigation or approval process. Moreover, in one of the six instances at Unit 2, the inspectors identified that no investigation or follow-up had occurred. In some cases, the occurrences were over two months old, which the inspectors noted would have made resultant investigations more challenging to perform. In other cases, the alarms were not identified until the worker attempted to re-enter the RCA and the access control system required manual override to "un-lock" the occurrence to allow entry into the RCA. The inspectors noted that the controlling Entergy procedure for this activity, EN-RP-203, "Dose Assessment," specifies that for a dose-rate alarm that is unanticipated or un-briefed, several actions are required, one of which is to initiate a condition report, another is to document the investigation using an attachment in the procedure. Contrary to EN-RP-203, for these 21 instances, no condition reports or attachments were generated with a detailed investigation prior to the workers re-entering the radiologically controlled area. The highest exposure received by these workers during their entry, as indicated by their electronic dosimeter and logged by the access control system, was 33 mRem, while most dosimeters indicated less than 1 mRem for the entry.

Analysis. The inspectors determined that the failure to generate a condition report, as well as the failure to adequately investigate six unplanned or un-briefed electronic dosimeter alarms prior to re-entry into the Unit 2 RCA, as required by station procedure was a performance deficiency. This performance deficiency was within Entergy personnel's ability to foresee and correct, and should have been prevented. This issue was not subject to traditional enforcement, in that it did not have actual safety consequence, it was not an issue that had the potential to impact NRC's ability to perform its regulatory function, and there were no willful aspects.

The finding is more than minor because it is associated with the Occupational Radiation Safety cornerstone attribute of programs and process, and adversely affected its objective to ensure adequate protection of worker health and safety from exposure to radiation. Moreover, the inspectors identified a programmatic deficiency to maintain and implement programs to keep exposures as low as reasonably achievable, because multiple examples were identified regarding the failure to satisfy station radiation protection procedures. Specifically, in six cases, Entergy did not fully evaluate dose rate alarms received by workers in radiologically controlled areas of the plant. Using the Occupational Radiation Safety Significance Determination Process, the inspectors determined that the finding was of very low safety significance (Green) because it did not involve: (1) as low as is reasonably achievable planning and controls, (2) an

overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose.

The inspectors determined that the finding had a cross-cutting aspect related to procedural adherence in the Work Practices component of the Human Performance area. Specifically, Entergy employees did not follow procedures to generate condition reports and document investigations when high-dose rate alarms were received by workers. (H.4 (b) per IMC 0305)

Enforcement. Technical Specification 5.4.1.a, "Procedures," requires that Entergy establish, implement, and maintain procedures specified in Regulatory Guide (RG) 1.33, Revision 2, Appendix A., Section 7.e, radiation protection procedures for personnel monitoring. Entergy procedure EN-RP-203, Revision 2, Section 5.11, requires that a condition report be written for each unplanned or un-briefed electronic dosimeter dose-rate alarm. Contrary to the above, the inspectors identified through a review of electronic dosimeter log information from January 2009 through March 2009, six instances of unanticipated or un-briefed electronic dosimeter dose-rate alarms when the procedure was not implemented and condition reports were not generated. Because this finding was of very low safety significance and it was entered into the corrective action program as CR-IP3-2009-001253 and CR-IP3-2009-001318, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **NCV 05000247/2009002-07, Failure to Follow Radiation Protection Procedures.**

## 2OS2 ALARA Planning and Controls (71121.02 - 12 samples)

### a. Inspection Scope

From March 23 through March 27, 2009, the inspectors conducted the following activities to verify that Entergy was properly maintaining individual and collective radiation exposures as low as is reasonably achievable (ALARA). Implementation of the ALARA program was reviewed by inspectors against the criteria contained in 10 CFR 20, applicable industry standards, and Entergy's procedures.

This inspection activity represents completion of twelve (12) samples relative to this inspection area.

### Inspection Planning

- (1) The inspectors reviewed pertinent information regarding cumulative exposure history, current exposure trends, and on-going activities to assess current performance and outage exposure challenges. The inspectors determined the site's 3-year rolling collective average exposure.
- (2) The inspectors reviewed unit 3 outage work related activities occurring during the inspection period, the associated ALARA plans, RWPs, ALARA Committee Reviews, exposure estimates, actual exposures and post job reviews. Work reviewed included: Refuel Floor Split Pin and Reactor Head Inspections, Refuel Floor Lower Internals Removal and Installation, Refuel Floor and Fuel Support Building Fuel Transport Equipment Repairs requiring an underwater diver, Reactor Coolant Pump work including RCP #31 Impeller replacement,



Containment valve work including Pressurizer Safety Valves, Various Containment and Auxiliary Building activities.

- (3) The inspectors reviewed implementing procedures associated with maintaining occupational exposures ALARA. This included a review of the processes used to estimate and track work activity exposures.

#### Radiological Work Planning

- (4) With respect to the work activities listed above, the inspectors reviewed dose summary reports, related post-job ALARA reviews, related RWPS, exposure estimates and actual exposures, and ALARA Committee meeting paperwork. Through this review, the inspector determined that dose was appropriately managed and evaluated by Station Management.
- (5) ALARA work activity evaluations, exposure estimates, and exposure mitigating requirements were reviewed for work packages previously mentioned. The inspectors determined that Entergy established procedures, engineering and work controls, based on sound radiation protection principles.
- (6) The inspectors compared the results achieved with the intended dose that was established in the planning of the work. The inspectors determined the reasons for any inconsistencies between the intended and actual work activity doses and station management awareness and involvement.
- (7) The inspectors evaluated for adequacy, the interfaces between operations, radiation protection, maintenance, maintenance planning and others for interface problems or missing program elements.

#### Verification of Dose Estimates and Exposure Tracking Systems

- (8) Methods for adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work is encountered, was reviewed by the inspectors for adequacy.

#### Job Site Inspections and ALARA Controls

- (9) The inspectors reviewed work activities that present the highest radiological risk to workers. The inspectors evaluated Entergy's use of engineering controls to achieve dose reductions and to verify that procedures and controls are consistent with ALARA reviews. Associated ALARA Plans and RWPs were reviewed to determine if appropriate exposure and contamination controls were being employed.

#### Radiation Worker Performance

- (10) Through observations and interviews, workers and technicians were found to be knowledgeable of the work area radiological conditions and low dose waiting areas.

Declared Pregnant Workers

- (11) The inspectors reviewed information associated with declared pregnant workers during the assessment period and whether appropriate monitoring and controls were being utilized to ensure compliance with 10CFR Part 20.

Problem Identification and Resolution

- (12) The inspectors reviewed elements of the Entergy's corrective action program related to implementing radiological controls to determine if problems are being entered into the program for timely resolution.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES [OA]**4OA1 Performance Indicator Verification (71151 - 3 samples)a. Inspection Scope

The inspectors reviewed performance indicator data for the cornerstones listed below and used Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5, to verify individual performance indicator accuracy and completeness. The documents reviewed during this inspection are listed in the Attachment.

Initiating Events Cornerstone

- Unplanned Scrams per 7000 Critical Hours (January 2008 to December 2008)
- Unplanned Transients per 7000 Critical Hours (January 2008 to December 2008)

The inspectors reviewed data and plant records from January 2008 to December 2008. The records included PI data summary reports, licensee event reports, operator narrative logs, Entergy's corrective action program, and Maintenance Rule records. The inspectors verified the accuracy of the number of critical hours reported, and interviewed the system engineers and operators responsible for data collection and evaluation.

Barrier Integrity Cornerstone

- RCS Activity (January 2008 to December 2008)

The inspectors reviewed data and plant records from January 2008 to December 2008. The records included performance indicator data summary reports, licensee event reports, operator narrative logs, Entergy's corrective action program, and Maintenance Rule records. The inspectors verified the accuracy of the number of critical hours reported, and interviewed the system engineers and operators responsible for data collection and evaluation.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Problem Identification & Resolution Program Review

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and to identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of all items entered into Entergy's corrective action program. The review was accomplished by accessing Entergy's computerized database for condition reports, and attending condition report screening meetings.

In accordance with the baseline inspection modules, the inspectors selected corrective action program items across the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for further follow-up and review. The inspectors assessed Entergy's threshold for problem identification, adequacy of the causal analysis, extent of condition reviews, and operability determinations, and timeliness of the associated corrective actions. The condition reports reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified

4OA3 Event Followup

.1 Condensate Return Line Leak on February 15, 2009

a. Inspection Scope

On February 15, 2009, an operator observed indications of wetness in a pipe sleeve in the floor of the auxiliary feed pump building. The operator notified the control room. Chemistry samples of the water were drawn and analyzed. On February 16, Entergy determined the chemistry results indicated the water was from the condensate storage tank (CST) return line. The inspectors reviewed the technical specifications (TS) to determine whether operators entered the applicable TS action statements for the CST and completed required actions to administratively determine the back-up on-site city water tank was available, if needed, to provide water to the auxiliary feedwater pumps. The inspectors reviewed Entergy's operability evaluation of the CST to determine whether it was technically supported. In addition, the inspectors reviewed the impact of the leak on the auxiliary feed water system which utilizes the CST as a primary source of water and circulates water back to the CST through the CST return piping. The inspectors also reviewed chemistry and radiological samples taken of the water to assess the environmental impact of the leak and determine if the release was below NRC regulatory limits for liquid effluents.

b. Findings and Observations

No findings of significance were identified.

Entergy excavated a portion of the CST piping in the area of the identified leakage and determined that the CST return pipe was leaking due to a hole the pipe where a small area of a protective coating was missing. Entergy also identified two additional areas of piping with metal loss that did not exceed ASME Code minimum required wall thickness. However, the areas were repaired while the opportunity existed. Entergy removed the portion of pipe with the localized defects and sent the specimen to a laboratory for analysis to identify the causes. The inspectors determined that the actions Entergy implemented to evaluate and repair the leaking CST pipe to restore operability to the CST were adequate and in accordance with their operating license. Additionally, the inspectors determined that the evaluations and actions Entergy performed to evaluate and maintain operability of the auxiliary feed pumps were adequate. Entergy analyzed the water leaking up through the sleeve and determined it was CST water based on hydrazine and tritium levels. The amount of tritium detected in the water was consistent with that found in the CST, for example, analyses of samples of water from the leak returned 2000 - 2300 picocuries per liter (pCi/l). The release was determined to be below the NRC regulatory limits for liquid effluents. For added perspective, while not drinking water, the Environmental Protection Agency environmental limit for drinking water requires tritium levels less than 20,000 pCi/l.

Entergy initiated a root cause analysis to determine causes of the leak that is scheduled to be completed in May 2009. At the end of the inspection period, the inspectors were monitoring the performance of Entergy in implementing its corrective action program to address the issue and develop a root cause evaluation and further corrective actions.

40A5 Other Activities

.1 Continued Groundwater Sampling Effort to Monitor Tritium (Deviation Memorandum Inspection)

a. Inspection Scope

During the week of March 23-27, 2009, the inspectors met with Entergy representatives to review the results of recent groundwater samples, as well as those taken and analyzed in 2008. The review was conducted against criteria contained in 10CFR20, 10CFR50, and applicable industry standards.

The review of the data included a comparison of Entergy's data with split samples taken by the NRC of monitoring wells MW-66 and MW-67, as well as the LaFarge sample point. In all, 47 samples were analyzed and compared from January 2008 through January 2009. Isotopic analyses were performed and compared at each of the sample points for: Tritium, Strontium 90, Nickel 63, and gamma emitters such as Cobalt-60 and Cesium-137. Results of the NRC samples can be found in ADAMS accession numbers: ML081420676, ML082690244, ML082690202, ML082690237, ML082730830, ML082730810, ML090400523, ML090400516, ML090400502, ML090923932, ML090920949.

Entergy's evaluation of recent groundwater results are documented in condition reports: CR-IP2-2009-00883, CR-IP2-2009-01110, CR-IP2-2009-01111, CR-IP2-2009-01113, and CR-IP2-2009-01114.

b. Findings

No findings of significance were identified.

The inspectors concluded that overall, there was agreement between Entergy personnel's results and those independently analyzed by the NRC, and that actions taken by Entergy have been appropriate. The inspectors also noted that conservative estimates indicate that the samples represent a very small fraction of the permissible public dose limits and are negligible with respect to natural background radiation levels.

.2 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that these activities were consistent with Entergy security procedures and applicable regulatory requirements. Although these observations did not constitute additional inspection samples, the inspections were considered an integral part of the normal, resident inspector plant status reviews during implementation of the baseline inspection program.

b. Findings

No findings of significance were identified.

4OA6 Meetings

Exit Meeting Summary

On April 15, 2009, the inspectors presented the inspection results to Joe Pollock and other Entergy staff members, who acknowledged the inspection results presented. Entergy did not identify any material as proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Entergy Personnel

J. Pollock,	Site Vice President
A. Vitale,	General Manager, Plant Operations
P. Conroy,	Director of Nuclear Safety Assurance
A. Williams,	Site Operations Manager
B. Sullivan,	Emergency Planning Manager
S. Verrochi,	System Engineering Manager
R. Walpole,	Licensing Manager
D. Loope,	Manager, Radiation Protection

### LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

#### Opened and Closed

05000247/2009002-01	FIN	Failure to Identify Open Louvers in 11 Fire Pump House (Section 1R01)
05000247/2009002-02	NCV	Failure to Identify Damaged Components in EDG Ventilation Motor Control Center #2 (Section 1R05)
05000247/2009002-03	NCV	Failure to identify and Promptly Correct Degraded 480 Volt Switchgear Room Fire Door (Section 1R05)
05000247/2009002-04	NCV	Inadequate Maintenance Procedure for EDG Ventilation Motor Control Center #2 (Section 1R12)
05000247/2009002-05	NCV	Failure to Include RWST Level Maintenance In Online Risk Assessment (Section 1R13)
05000247/2009002-06	NCV	Inadequate Test Acceptance Criteria for Auxiliary Component Cooling Check Valves (Section 1R22)
05000247/2009002-07	NCV	Failure to Follow Radiation Protection Procedures (Section 2OS1)

## LIST OF DOCUMENTS REVIEWED

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

#### Procedures

OAP-048, Rev. 4, Seasonal Weather Preparation  
 OAP-008, Rev. 5, Severe Weather Preparations  
 2-AOP-SSD-1, Rev. 13, Control Room Inaccessibility Safe Shutdown Control  
 OAP-017, Rev. 5, Plant Surveillance and Operator Rounds  
 EN-OP-115, Rev. 5, Conduct of Operations

#### Condition Reports

IP2-2009-00197	IP2-2009-00207	IP2-2009-00208	IP2-2009-00211
IP2-2009-00212	IP2-2009-00214	IP2-2009-00215	IP2-2009-00226

#### Orders

00152922	00153082	00153083	00179583
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### **Section 1R04: Equipment Alignment**

#### Procedures

2-PT-M103, Rev. 2, Auxiliary Feedwater System Monthly Alignment Verification  
 2-COL-4.1.1, Rev. 22, Component Cooling System

### **Section 1R05: Fire Protection**

#### Procedures

SAO-703, Rev. 25, Fire Protection Impairment Criteria and Surveillance  
 EN-DC-161, Rev. 2, Control of Combustibles  
 OAP-037, Rev. 2, Operations Electrical Equipment Operating Guidelines  
 IP-SMM-IS-103, Rev. 0, IPEC Site Management Manual Electrical Safety  
 2-PT-SA020, Rev. 0, Swing Fire Doors

#### Condition Reports

IP2-2009-00904	IP2-2009-00526	IP2-2009-00680	IP2-2009-00709
IP2-2009-00834	IP2-2009-00342	IP2-2009-00483	IP2-2004-05336
IP2-2007-03561	IP2-2007-04645	IP2-2008-05447	

#### Orders

51645822	51676572
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#### Miscellaneous

Indian Point Nuclear Generating Station, Unit 2, Fire Protection Program Plan, Rev. 9  
 Indian Point Pre-Fire Plans Unit 2 – Nuclear  
 IP2-RPT-03-00015, "IP2 Fire Hazards Analysis," Rev. 3

### **1R07: Heat Sink Performance**

#### Procedures

SEP-SW-001, NRC Generic Letter 89-13 Service Water Program  
 PT-2Y10B, 22 CCW HX Test  
 2-HTX-004-CCW, Component Cooling Water Heat Exchanger Maintenance

Work Orders

51675733

Condition Reports

IP2-2005-0673

IP2-2005-0768

IP2-2005-1268

IP2-2006-7126

IP2-2006-3974

Miscellaneous

EPRI NP-7552, Heat Exchanger Performance Monitoring Guidelines

Preliminary Report of Eddy Current Testing dated 2/10/09

21 CCW Hx Inspection Reports dated 2/23/2005 and 1/8/2007

22 CCW Hx Inspection Reports dated 2/23/2005 and 12/12/2006

**Section 1R11: Licensed Operator Regualification Program**Procedures

OAP-033, "Conduct of Operations Simulator Training, Evaluations, and Debriefs," Rev. 4

OAP-032, "Operations Training Program," Rev. 9

2-E-0, Rev. 0, Reactor Trip or Safety Injection

2-ECA-0.0, Rev. 3, Loss of All AC Power

2-AOP-480V-1, Rev. 5, Loss of Normal Power to any 480V Bus

Miscellaneous

LRQ-SES-21, Rev. 0, IPEC Evaluated Scenario for Loss of All AC Power

**Section 1R12: Maintenance Effectiveness**Procedures2-MCC-003-ELC, Rev 0, Klockner-Moeller, Series 200, 480 Volt Motor Control Center  
Preventive Maintenance

2-PC-Q2, Rev. 19, Refueling Water Storage Tank Level

0-MS-412, Rev. 0, Inspection and Cleaning of Bus Bars, Contacts, Ground Connections, Wiring  
and Insulators

IP-SMM-IS-103, Rev. 0, IPEC Site Management Manual Electrical Safety

0-GNR-404-ELC, Rev. 1, Emergency Diesel Generator 2-Year Inspection

2-GNR-015-ELC, Rev. 2, Emergency Diesel Generator Preventive Maintenance 2-Year

2-PT-M021B, Rev. 17, Emergency Diesel Generator 22 Load Test

Condition Reports

IP2-2009-00527

IP2-2009-00532

IP2-2009-01041

IP2-2003-00948

IP2-2009-00342

IP2-2009-00483

IP2-2004-03106

IP2-2007-01893

IP2-2008-05382

IP2-2009-00486

IP2-2009-00041

IP2-2009-00178

IP2-2006-04101

IP2-2009-00093

IP2-2007-03476

IP2-2007-04921

IP2-2008-00454

IP2-2008-00907

IP2-2008-03976

Orders

51557262

51676147

06-16146

51696697

51322921

51268313

00181009

00167536

04-26645

57696714

51649505

51654261

00118733

07-03476

07-04921

08-00454

08-00907

09-00532

Drawing

309030-02, Loop diagram RWST level indication

3WS-463-610-14-20101-3, Schematic for EDG HVAC Heater



IP2-S-000231-04, Schematic for EDG Building Ventilation Distribution  
B248513-12, 480V MCC 26C and CCR Ventilation Distribution  
B228434-02, Class "A" Boundary for Electrical Systems

Miscellaneous

Maintenance Rule Basis Document Residual Heat Removal System, dated 5/23/05  
Maintenance Rule Basis Document HVAC Emergency Diesel Building, dated 5/23/05  
IP-SMM-AD-102, Att 10.2, dated 4/6/08, for revision to procedure 2-MCC-003-ELC  
Vendor Manual, Klockner-Moeller Series 200 Motor Control Center  
Vendor Manual, Qmark MUH Series Modular Unit Heaters  
Vendor Manual, ALCO Fuel Injection Nozzle and Holder  
Maintenance Rule Expert Panel Meeting Minutes dated 2/14/05  
Tagout 2-480V-Panel-MCC26C dated 4/3/08  
DRN-08-01336 dated 4/6/08 for procedure 2-MCC-003-ELC  
PMCR ER-06-33534, to establish maintenance activity for EDG HVAC MCC

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures

IP-SMM-WM-101, On-Line Risk Assessment  
2-PC-Q109, Recalibration of Nis and OT/OP delta T parameters  
PT-Q17A, Verify ASSS supply to 21 AFP  
2-PT-Q027A, 21 Auxiliary Feed Pump  
2-PC-Q2, Rev. 19, Refueling Water Storage Tank Level  
2-ES-1.3, Rev. 2, Transfer to Cold Leg Recirculation

Condition Reports

IP2-2009-00018      IP2-2009-00027      IP2-2009-00139      IP2-2009-00143  
IP2-2009-00148      IP2-2009-00389

Work Orders

00165604      51654961      51692571      51692351      51696697

Miscellaneous

Equipment Out-Of-Service (EOOS) risk assessment reports

**Section 1R15: Operability Evaluations**

Procedures

2-PT-Q031A, 21 Auxiliary Component Cooling Pump  
2-PT-Q031B, 22 Auxiliary Component Cooling Pump  
EN-MA-133, Control of Scaffolding  
2-AOP-IB-1, Loss of Power to an Instrument Bus  
2-PT-M021B, Rev. 17, Emergency Diesel Generator 22 Load Test  
2-SOP-AFW-002, Rev. 1, Auxiliary Feedwater System Operation Support Procedure

Drawings

A249955-21, 480V AC MCC 29 & 29A

Calculation

IP3-CALC-FW-01482, Rev. 0, Feedwater Stratification and Auxiliary Feedwater

Condition Reports

IP2-2009-0500	IP2-2009-0505	IP2-2008-3749	IP2-2009-0547
IP2-2009-0567	IP2-2009-0509	IP2-2005-0252	IP2-2009-0552
IP2-2009-0655	IP2-2008-2705	IP2-2009-0041	IP2-2009-0093

Work Orders

NP-99-07694

Miscellaneous

WCAP-12312, Rev. 2, Safety Evaluation for an Ultimate Heat Sink Temperature Increase to 95F at Indian Point Unit 2

Heat exchanger data sheet for containment recirculation pump number 22 motor cooler

WCAP-7829, Fan Cooler Motor Unit Test

Environmental Qualification Report for Containment Recirculation Pump Motors

IP2-CCW-DBD, Component Cooling Water design bases document

IP2-DBD-207, Design Basis Document for 118V AC Electrical System

AMSE OM-2001 Edition

Unit 2 active scaffold list

VM 1073-1.2, Vendor manual for auxiliary component cooling pumps

VM 1100, vendor manual for 118V AC solid state static inverters

Work order NP-89-43777, replacement of 22 ACCP impeller

IP2-AFW-DBD, Rev. 1, AFW Design Basis Document

**Section 1R18: Plant Modifications**Procedures

2-SOP-18-1, Main and Reheat Steam System

TP-SQ-11.016, Post Work Test Program (historical)

Condition Reports

IP2-2009-0983	IP2-2009-0137	IP2-2008-5636	IP2-2009-0077
IP2-2009-0069	IP2-2009-0062	IP2-2008-5621	IP2-2009-0781

Work Orders

IP2-03-11725	IP2-02-32013	51305160
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Drawings

B235623-6, Atmospheric Steam Dump Panel

9321-F-70313, Auxiliary Boiler Feed Pump Room Instrument Piping

Miscellaneous

IP2 Maintenance Rule Basis for Main Steam System

IP2-MS-DBD, Design Basis Document for the Main Steam System

IPT-RPT-05-00071, Appendix R Safe Shutdown Analysis

SEE-03-5, Indian Point Unit 2 RHR Cooldown Analysis for the 5% Power Uprate

IP2 Inservice Testing Program Basis Data Sheets for PCV-1136 & 1137 (23/24 SG ADVs)

ER 06-2-012, Install Secondary Backup Nitrogen Cylinders at both S/G ADV Local Control Panels in the ABFP Building

**Section 1R19: Post-Maintenance Testing**

Procedures

OAP-24, "Operations Testing," Rev. 3  
2-PT-M021C, Rev. 16, Emergency Diesel Generator 23 Load Test  
0-GNR-403-ELC, Emergency Diesel Generator Quarterly Inspection  
2-PT-Q033B, 21 Charging Pump  
2-SOP-4.1.2, Rev. 34, Component Cooling System Operation

Orders

51797559      51797558      52027651      00183296      00157710      51675732

**Section 1R22: Surveillance Testing**

Procedures

2-PT-2M4, Safety Injection System Train "A" Actuation Logic and Master Relay Test  
2-PT-Q013, Inservice Valve Tests  
2-PT-Q013-DS027, Valve 888A IST Data Sheet  
0-SOP-LEAKRATE-001, Rev. 1, RCS Leakrate Surveillance, Evaluation and Leak Identification  
2-PT-Q030C, Rev. 18, 23 Component Cooling Water Pump

Drawings

11497, Valve 888A

Condition Reports

IP2-2007-1754      IP2-2008-1443      IP2-2008-2002      IP2-2007-3329

Orders

51694305

Miscellaneous

IP2-ESF DBD, Design Basis Document for Engineered Safeguards Features System  
IP2 Inservice Testing Program Data Sheet – Valve 888A  
PGI-00066-01, 888 A & B Diff Pr Calc

**Section 1EP6: Drill Evaluation**

Procedures

IP-EP-120, Rev. 3, Emergency Classification

Miscellaneous

IP-EP-115, Rev. 24, form EP-1 radiological emergency data forms dated 2/23/09

**Section 2OS1: Access Control to Radiologically Significant Areas and  
Section 2OS2: ALARA Planning and Controls**

Procedures

EN-RP-100, Rev. 03, Radworker Expectations  
EN-RP-101, Rev. 04, Access Control for Radiologically Controlled Areas  
EN-RP-102, Rev. 02, Radiological Control  
EN-RP-105, Rev. 04, Radiation Work Permits  
EN-RP-108, Rev. 07, Radiation Protection Posting  
EN-RP-110, Rev. 05, ALARA Program

EN-RP-121, Rev. 04, Radioactive Material Control  
EN-RP-131, Rev. 06, Air Sampling  
EN-RP-141, Rev. 04, Job Coverage  
EN-RP-151, Rev. 02, Radiological Diving  
EN-RP-202, Rev. 06, Personnel Monitoring  
EN-RP-203, Rev. 02, Dose Assessment  
EN-RP-204, Rev. 02, Special Monitoring Requirements  
EN-RP-205, Rev. 02, Prenatal Monitoring  
EN-RP-208, Rev. 02, Whole Body Counting and In-Vitro Bioassay

Condition Reports

CR-IP3-2009-00752, CR-IP3-2009-00785, CR-IP3-2009-00857, CR-IP3-2009-00885  
CR-IP3-2009-00886, CR-IP3-2009-00937, CR-IP3-2009-00998, CR-IP3-2009-01006  
CR-IP3-2009-01107, CR-IP3-2009-01154, CR-IP3-2009-01169, CR-IP3-2009-01171  
CR-IP3-2009-01183, CR-IP3-2009-01253, CR-IP3-2009-01293, CR-IP3-2009-01295  
CR-IP3-2009-01296, CR-IP3-2009-01318, CR-IP2-2009-00883, CR-IP2-2009-01110,  
CR-IP2-2009-01111, CR-IP2-2009-01113, CR-IP2-2009-01114

Miscellaneous

Radiation Protection Attention Logs (Electronic Dosimeter Alarms)  
TEDE ALARA Evaluations  
ALARA Committee Reviews  
RP-STD-XX, Rev. X, "Unreported Dosimeter Alarms and Anomalies" (Draft)  
IPEC Snapshot Self-Assessment Report (IP3-LO-2007-0010) July 2007 – June 2008.  
RWP's: 2009-002, 2009-003, 2009-2021, 2009-3001, , 2009-3002, 2009-3056, 2009-3501,  
2009-3504, 2009-3515, 2009-3529

**Section 40A1: Performance Indicator Verification**

EN-EP-201, "Performance Indicators," Rev. 6  
EN-LI-114, "Performance Indicator Process," Rev. 3  
NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Rev. 5  
0-CY-2765, Rev. 3, Coolant Activity Limits

**Section 40A2: Identification and Resolution of Problems**

Procedures

EN-LI-102, Rev. 13, Corrective Action Process

Condition Reports

IP2-2009-00342	IP2-2009-00483	IP2-2004-03106	IP2-2007-01893
IP2-2008-05382	IP2-2009-00486	IP2-2009-00027	IP2-2009-00139
IP2-2009-00143	IP2-2009-00148		

**LIST OF ACRONYMS**

ALARA	as low as is reasonably achievable
ABFW	auxiliary boiler feedwater
ABFP	auxiliary boiler feedwater pump
ACCP	auxiliary component cooling pump
ADAMS	Agency-wide Document and Management System
ASME	American Society of Mechanical Engineers
CAP	corrective action program
CCW	component cooling water
CDF	core damage frequency
CFR	Code of Federal Regulations
CST	condensate storage tank
EDO	Executive Director of Operations
EDG	emergency diesel generator
ENTERGY	Entergy Nuclear Northeast
EP	Emergency Preparedness
HRA	high radiation area
IMC	Inspection Manual Chapter
IPEC	Indian Point Energy Center
IST	in-service test
MCC	motor control center
NCV	non-cited violation
NDE	non-destructive examination
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NSR	non safety-related
PARS	Publicly Available Records System
PI	performance indicator
RCA	radiologically controlled area
RCS	reactor coolant system
RWP	radiation work permit
RWST	refueling water storage tank
SDP	significance determination process
SER	safety evaluation report
SG	steam generator
SR	safety related
SSC	structures, systems, and components
TS	Technical Specification
UFSAR	Updated Final Safety Evaluation Report
URI	unresolved item
WO	work order