



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

February 11, 2011

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 05000247/2010005

Dear Mr. Pollock:

On December 31, 2010, 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 January 19, 2011 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 four NRC-identified and five self-revealing findings of very low safety significance (Green). Additionally, two licensee-identified violations which were determined to be of very low safety significance are listed in this report. Six findings were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they are entered into your corrective action program, the NRC is treating these as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region 1; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Indian Point Nuclear Generating Unit 2. In addition, if you disagree with the cross-cutting aspect assigned to the findings in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region 1, and the NRC Senior Resident Inspector at Indian Point Nuclear Generating Unit 2.

In accordance with Title 10 of the Code of Federal Regulations (10 CFR) 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 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,

A handwritten signature in black ink, appearing to read "Mel Gray", with a long, sweeping flourish extending to the right.

Mel Gray, Chief
Projects Branch 2
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000247/2010005
w/ Attachment: Supplemental Information

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Sincerely,

/RA/

Mel Gray, Chief
Projects Branch 2
Division of Reactor Projects

Docket No. 50-247
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w/ Attachment: Supplemental Information

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U.S. Nuclear Regulatory Commission

Region I

Docket No.: 50-247

License No.: DPR-26

Report No.: 05000247/2010005

Licensee: Entergy Nuclear Northeast (Entergy)

Facility: Indian Point Nuclear Generating Unit 2

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

Dates: October 1, 2010 through December 31, 2010

Inspectors: M. Catts, Senior Resident Inspector – Indian Point 2
O. Ayegbusi, Resident Inspector – Indian Point 2
S. Barr, Senior Emergency Preparedness Specialist – Region I
T. Burns, Reactor Inspector – Region I
D. Caron, Senior Physical Security Inspector – Region I
D. Jones, Senior Reactor Inspector, Region III
R. Latta, Senior Reactor Inspector – Region IV
J. Nicholson, Health Physicist – Region I
J. Noggle, Senior Health Physicist – Region I
P. Presby, Senior Operations Engineer – Region I
P. Prescott, Senior Quality and Vendor Program Engineer – NRR
S. Chaudhary, Reactor Inspector – Region I

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

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SUMMARY OF FINDINGS

IR 05000247/2010005; 10/01/2010 – 12/31/2010: Indian Point Nuclear Generating (Indian Point) Unit 2; Post-Maintenance Testing; Occupational ALARA Planning and Controls; Identification and Resolution of Problems; Event Follow-up; and Other Activities.

This report covered a three-month period of inspection by resident and region based inspectors. Six non-cited violations (NCVs) and three findings of very low safety significance (Green) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)." The cross-cutting aspect for the findings was determined using IMC 0310, "Components within the Cross-Cutting Areas." Findings for which the significance determination process 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.

Cornerstone: Initiating Events

- Green. A Green self-revealing finding was identified because Entergy's procedure 2-IC-PC-N-P-408A, "Main Boiler Feed Pump (MBFP) Discharge Pressure Speed Control," did not provide adequate guidance to ensure proper settings for the MBFP speed controller settings at low power operations. Specifically, between May 5, 2006 and September 3, 2010, procedure 2-IC-PC-N-P-408A did not provide adequate guidance to ensure proper settings for the MBFP speed controller settings at low power operations, resulting in a slow MBFP response, which contributed to a reactor trip from 41% power. Entergy personnel took immediate corrective actions to change the MBFP speed controller settings. This issue was entered into Entergy's corrective action program (CAP) as condition report (CR)-IP2-2010-05484.

This finding is more than minor because it is associated with the design control attribute of the Initiating Events cornerstone and affects the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, inadequate design control of the MBFP speed controller settings contributed to a reactor trip. Using IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because the finding did not contribute to the likelihood that mitigation equipment or functions would not be available.

The inspectors determined there was no cross-cutting issue associated with the finding because the performance deficiency did not reflect Entergy's current performance. Specifically, the performance deficiency occurred more than three years ago and was outside the current assessment period. (Section 4OA3)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion X, "Inspection," because Entergy personnel did not ensure that quality control verification inspections were consistently included and correctly specified in quality-affecting procedures and work instructions for construction-like work activities as required by the quality assurance program (QAP). Entergy personnel performed extensive reviews and

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initiated prompt fleet-wide corrective actions to ensure proper work order evaluation and proper inclusion of quality control verification inspections. This issue was entered into Entergy's corrective action program (CAP) as CR-HQN-2009-01184 and CR-HQN-2010-0013.

This finding is more than minor because it is a programmatic deficiency that if left uncorrected, could lead to a more significant safety concern in that the failure to check quality attributes could involve an actual impact to plant equipment. This finding is associated with the design control attribute of the Mitigating Systems cornerstone because missed quality control inspections during plant modifications could impact the availability, reliability, and capability of systems needed to respond to initiating events. Using IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because the finding is a qualification deficiency confirmed not to result in a loss of operability or functionality. Specifically, inspectors verified by sampling that work documents provided objective quality evidence that work activities that had missed quality control verifications were properly performed.

The finding has a cross-cutting aspect in the area of human performance associated with the decision-making attribute because Entergy personnel did not have an effective systematic process for obtaining interdisciplinary reviews of proposed work instructions to determine whether Quality Control verification inspections were appropriate. [H.1(a) per IMC 0310] (Section 4OA2)

- Green. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion II, "Quality Assurance Program (QAP)," because Entergy personnel did not implement the qualification and experience requirements of the QAP to ensure that an individual assigned to the position of quality assurance manager (QAM) met the qualification and experience requirements of ANSI/ANS 3.1-1978. Specifically, the individual assigned as the responsible person for the Entergy's overall implementation of the QAP did not have at least one year of nuclear plant experience in the overall implementation of the QAP within the quality assurance organization prior to assuming those responsibilities. This issue was entered into Entergy's CAP as CR-HQN-2010-00386.

This finding is more than minor because if left uncorrected, it could lead to a more significant safety concern. Specifically, the failure to have a fully qualified individual providing overall oversight to the QAP had the potential to affect all cornerstones. However, this finding will be tracked under the Mitigating Systems cornerstone as the area most likely to be impacted. The finding was not suitable for quantitative assessment using existing Significance Determination Process guidance. Using IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," NRC management determined the finding to be of very low safety significance (Green) because other quality assurance program functions remained unaffected by this performance deficiency, so defense-in-depth continued to exist.

The inspectors determined there was no cross-cutting aspect associated with this finding because the performance deficiency did not reflect Entergy's current performance. Specifically, the performance deficiency occurred more than three years ago and was outside the current assessment period. (Section 4OA2)

- Green. A Green self-revealing NCV of Technical Specification (TS) 5.1, "Responsibility," was identified because on February 9, 2010, the control room supervisor (CRS) assigned as having the control room command function, left the control room without designating another senior reactor operator (SRO) qualified individual to assume the control room command function. The CRS promptly returned to the control room shortly after the issue was identified. This issue was entered into Entergy's CAP as CR-IP2-2010-00708.

The finding is more than minor because it could be reasonably viewed as a precursor to a significant event. Specifically, the absence of SRO oversight during licensed control room activities increases the likelihood of human performance errors contributing to an initiating event and reduces the effectiveness of event mitigation. The finding is associated with the human performance attribute of the Mitigating Systems cornerstone and affects the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was not suitable for quantitative assessment using existing Significance Determination Process guidance. Using IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," NRC management determined the finding to be of very low safety significance (Green) because of the short period the CRS was absent from the control room, and because no initiating events occurred during that time.

The finding has a cross-cutting aspect in the area of human performance associated with the work practices attribute because of the ineffective use of shift turnover practices, in that the CRS did not self check or communicate his decision to leave the control room to the rest of the control room staff. [H.4(a) per IMC 0310] (Section 40A5)

Cornerstone: Emergency Preparedness

- Green. The inspectors identified a Green NCV of 10 CFR 50.54, "Conditions of Licenses," paragraph (q), because Entergy staff did not implement adequate compensatory measures when the R-27 plant vent process radiation monitor, which is used for emergency action level (EAL) classification, was taken out of service. Specifically, between October 25, 2010 and November 24, 2010, the R-27 monitor was out of service for repair following preventive maintenance with inadequate compensatory measures regarding the impact on EAL classification capability. Entergy personnel implemented short-term corrective actions by providing adequate compensatory instructions for the operating crews. The issue was entered into Entergy's CAP as CR-IP-2010-06721 which includes longer-term corrective actions regarding emergency preparedness procedure changes.

This finding is more than minor because it affected the Emergency Response Organization attribute of the Emergency Preparedness (EP) cornerstone to ensure that the Entergy personnel are capable of implementing adequate measures to protect the public health and safety in the event of a radiological emergency. Specifically, Entergy personnel did not provide adequate compensatory measures for when the R-27 plant vent monitors were taken out of service. In accordance with IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the inspectors determined the finding to be of very low safety significance (Green). Using IMC 0609, Appendix B, Section 4.9 and Sheet 1, "Failure to Comply," the inspectors determined that the failure to comply with an aspect of the Emergency Plan related to event

classification (10 CFR 50.47(b)(4)) was a risk-significant planning standard (RSPS) problem; but it was not a RSPS functional failure of the Indian Point Energy Center (IPEC) event classification process.

This finding has a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action program attribute of taking appropriate corrective actions to address safety issues in a timely manner. Specifically, Entergy staff did not take appropriate emergency planning compensatory corrective actions when the R-27 plant vent radiation monitor was taken out of service. [P.1(d) per IMC 0310] (Section 1R19)

- Green. A Green self-revealing NCV of 10 CFR 50.54, "Conditions of Licenses," paragraph (q), was identified because Entergy staff did not adequately implement the requirements of the IPEC Emergency Plan. On the evening of November 7, 2010, the Unit 2 operators declared an Alert emergency at 1849 hours. The technical support center (TSC) was staffed and declared operational at 2008 hours, and the operations support center (OSC) was staffed and declared operational at 2015 hours. Both of these activation times exceeded the 60-minute staffing requirement in the IPEC Emergency Plan. This issue was entered into Entergy's CAP as CR-IP2-2010-6813, CR-IP2-2010-6831, and CR-IP2-2010-6871.

This finding is more than minor because it affected the Emergency Response Organization (ERO) attribute of the EP cornerstone to ensure that Entergy personnel are capable of implementing adequate measures to protect the public health and safety in the event of a radiological emergency. Entergy personnel did not meet the requirements of the IPEC Emergency Plan in that the TSC and OSC were not staffed nor declared operational within 60 minutes of the Alert emergency declaration on November 7, 2010. In accordance with IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the inspectors determined the finding to be of very low safety significance (Green). Using IMC 0609, Appendix B, Section 4.2 and Sheet 2, "Actual Event Implementation Problem," the inspectors determined that the failure to comply with an aspect of the Emergency Plan related to ERO augmentation (10 CFR 50.47(b)(2)) was a non-risk-significant planning standard problem which occurred during an Alert emergency and is therefore of very low safety significance (Green).

This finding has a cross-cutting aspect in the area of human performance associated with the work practices attribute of defining and effectively communicating expectations regarding procedural compliance and personnel following procedures. Specifically, Entergy staff did not comply with ERO expectations and procedures regarding prompt reporting to an assigned emergency response facility during an actual event. [H.4(b) per IMC 0310] (Section 4OA3)

- Green. The inspectors identified a Green NCV of 10 CFR 50.54, "Conditions of Licenses," paragraph (q), because the Entergy emergency plan implementing procedure (EPIP) for notification of offsite officials did not meet the requirements of the IPEC Emergency Plan. This EPIP had contained a deficiency in the backup process for offsite notification since July 2006. Entergy personnel responded by documenting the deficiency in CR-IP2-2010-07563 and by initiating a procedure change to align the backup process with the Emergency Plan commitments.

This finding is more than minor because it affected the Emergency Response Organization attribute of the EP cornerstone to ensure that the Entergy personnel are capable of implementing adequate measures to protect the public health and safety in the event of a radiological emergency. Entergy procedures allowed for a back-up notification process that did not comply with the requirements of the site emergency plan: the Emergency Plan requires that the Shift Manager or his designee notify the offsite authorities of an emergency declaration, while Form EP-4 directed the delegation of this responsibility to an offsite authority itself. In accordance with Inspection Manual Chapter (IMC) 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the inspectors determined the finding to be of very low safety significance (Green). Using IMC 0609, Appendix B, Section 4.5 and Sheet 1, "Failure to Comply," the inspectors determined that the failure to comply with an aspect of the Emergency Plan related to event notification (10 CFR 50.47(b)(5)) was a RSPS problem. It was not a RSPS functional failure of the IPEC event notification process, because the deficiency in the IPEC EPIP was in the backup method for offsite notification, and despite the procedural flaw offsite notifications were made in a timely and accurate manner on November 7, 2010.

The inspectors determined there was no cross-cutting aspect associated with this finding because the performance deficiency did not reflect Entergy's current performance. Specifically, the performance deficiency associated with a procedure change made in July 2006 occurred more than three years ago and was outside the current assessment period. (Section 4OA3)

Cornerstone: Occupational Radiation Safety

- Green. A Green self-revealing finding was identified because Entergy personnel did not adequately plan and control work activities related to a regenerative heat exchanger permanent shielding modification in accordance with radiation work permit (RWP) 20102537, "2R19 Permanent Regen Hx Shielding." Specifically, Entergy personnel did not perform walkdowns to support modification package planning and provided limited field supervision which resulted in significant unplanned collective exposure (17.189 person-rem compared to a revised work activity estimate of 8.000 person-rem). This issue was entered into Entergy's CAP as CR-IP2-2010-02817.

The finding is more than minor because it is associated with the program and process attribute of the Occupational Radiation Safety cornerstone and affected the cornerstone objective of ensuring the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine reactor operations. Additionally, this finding is similar to the more than minor example 6.j provided in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," because it involves an actual collective exposure greater than 5 person-rem and exceeded the planned, intended dose by more than 50%. Using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to have very low safety significance (Green) because the finding involved an as low as reasonably achievable (ALARA) planning issue and the 3-year rolling average collective dose history was less than 135 person-rem (52.261 person-rem average annual exposure for 2007-2009).

The finding has a cross-cutting aspect in the area of human performance associated with the work control attribute because Entergy's planned work activities did not

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adequately incorporate the job site interferences and their resolution in accordance with radiological safety. [H.3(a) per IMC 0310] (Section 2RS2)

- Green. A Green self-revealing finding was identified because Entergy personnel did not adequately plan and control work activities related to reactor cavity liner repair in accordance with RWP 20102530, "2R19 Cavity Liner Repair." Specifically, outage schedule delay and inadequate work coordination resulted in the use of back-up workers to perform the reactor cavity sealant removal work, and also resulted in reactor head shielding removal and cancellation of additional shielding that was specified in the ALARA plan, which resulted in significant unplanned collective exposure (7.058 person-rem compared to a revised work activity estimate of 3.635 person-rem). This issue was entered into Entergy's CAP as CR-IP2-2010-02817.

This finding is more than minor because it is associated with the program and process attribute of the Occupational Radiation Safety cornerstone and affected the cornerstone objective of ensuring the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine reactor operations. It is also similar to the more than minor example 6.j provided in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," because it involves an actual collective exposure greater than 5 person-rem and exceeded the planned, intended dose by more than 50%. Using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to have very low safety significance (Green) because the finding involved an as low as reasonably achievable (ALARA) planning issue and the 3-year rolling average collective dose history was less than 135 person-rem (52.261 person-rem average annual exposure for 2007-2009).

The finding has a cross-cutting aspect in the area of human performance associated with the work coordination attribute because Entergy personnel did not coordinate and implement work activities as planned, which resulted in significant dose overrun. [H.3(b) per IMC 0310] (Section 2RS2)

Other Findings

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

REPORT DETAILS

Summary of Plant Status

Indian Point Unit 2 began the inspection period operating at full reactor power (100%). The Unit 2 reactor automatically tripped on November 7, 2010, due to a fault on the 21 main transformer 'B' phase bushing which resulted in an Alert emergency declaration. Unit 2 remained shutdown to replace the 21 main transformer, and returned to full power on November 25, 2010. Unit 2 remained at or near full power during the remainder of the inspection period.

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

Because severe weather was forecast in the vicinity of the facility for December 1, 2010, the inspectors reviewed Entergy staff's overall preparations/protection for the expected weather conditions. The inspectors walked down systems required for normal operation and shutdown conditions because their safety related functions could be affected, or required, as a result of flooding. The inspectors evaluated the plant staff's preparations in accordance with site procedures to determine if actions were adequate. During the inspection, the inspectors focused on plant specific design features and station procedures used to respond to adverse weather conditions. The inspectors also toured the site to identify loose debris that could become projectiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for the systems selected for inspection, and reviewed whether operator actions were appropriate as specified by plant specific procedures. The inspectors also reviewed a sample of CAP items to verify whether Entergy personnel identified adverse weather impact issues at an appropriate threshold and dispositioned them through the CAP in accordance with station corrective action procedures.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one sample as defined in NRC Inspection Procedure 71111.01.

b. Findings

No findings were identified.

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

The inspectors performed partial system walkdowns of the following risk significant systems:

- October 8, 2010, Appendix R diesel generator (DG) after jacket water leak repair;
- October 25, 2010, 22 emergency diesel generator (EDG) after a maintenance outage; and
- November 3, 2010, 22 auxiliary component cooling water train after surveillance testing.

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors focused on those conditions that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, UFSAR, technical specification requirements, technical specifications (TSs), work orders (WOs), CRs and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Entergy staff had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of three partial system walkdown samples as defined in NRC Inspection Procedure 71111.04.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 5 samples)Resident Inspector Quarterly Walkdownsa. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk significant plant areas:

- Pre-Fire Plan (PFP)-216;
- PFP-252A;
- PFP-260;
- PFP-261; and
- PFP-262.

The inspectors reviewed areas to assess if Entergy personnel implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in proper material condition; and implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the station's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk and their potential to affect equipment that could initiate or mitigate a plant transient. Using the documents listed in the attachment, the inspectors reviewed whether fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also reviewed whether issues identified during the inspection were entered into the licensee's CAP.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of five quarterly fire protection inspection samples as defined in NRC Inspection Procedure 71111.05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the CAP to determine if the licensee identified and corrected flooding problems; and verified whether operator actions for coping with flooding are adequate. The inspectors also focused on the 480 volt switchgear room to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one internal flood protection measures inspection sample as defined in NRC Inspection Procedure 71111.06.

b. Findings

No findings were identified.

.2 Cables Located in Underground Manholes Inspection

a. Inspection Scope

The inspectors performed an inspection of underground Manhole 21, which contains safety related electrical cabling to the service water pumps (SWPs). The inspectors reviewed the UFSAR and related design basis documents to identify the requirements for the manhole design. The inspectors assessed the material condition of the support trays and cable insulation to verify there was no evidence of conditions that could challenge operability of the safety related pumps. The inspectors reviewed whether adverse conditions discovered during the manhole inspection, if applicable, were entered into Entergy's CAP.

Specific documents reviewed during this inspection are listed in the attachment. This inspection completed the inspection requirement for two manhole inspections in accordance with NRC inspection procedure 71111.06. The first inspection of a manhole was documented previously in NRC IR 05000247/2010003.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the 22 EDG jacket water heat exchanger to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and Entergy's commitments to NRC Generic Letter 89-13. The inspectors reviewed the results of previous inspections of the 22 EDG jacket water and similar heat exchangers. The inspectors discussed the results of the most recent inspection performed on October 12, 2010 with engineering, and reviewed pictures of the as-found and as-left conditions. The inspectors reviewed whether appropriate corrective actions were initiated for deficiencies identified by Entergy personnel. The inspectors also reviewed whether the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed by design.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one heat sink performance inspection sample as defined in NRC Inspection Procedure 71111.07A.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program.1 Quarterly Review (71111.11Q – 1 sample)a. Inspection Scope

On October 13, 2010, the inspectors observed a crew of licensed operators, responding to a simulated event involving a steam generator tube leak leading to a steam generator tube rupture and the failure of select components. The inspectors observed the scenario in the plant simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and that training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas regarding crew and operator performance:

- Clarity and formality of communications;
- Implementation of timely actions;
- Prioritization, evaluation, and verification of annunciator alarms;
- Usage and implementation of abnormal and emergency procedures;
- Control board operations;
- Identification and implementation of TS actions and emergency plan actions and notifications; and
- Oversight and direction from control room supervisors.

The inspectors compared the crew's performance in these areas to critical task completion requirements.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one quarterly licensed operator requalification program sample as defined in NRC Inspection Procedure 71111.11.

b. Findings

No findings were identified.

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

The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors;" and Inspection Procedure 71111.11, "Licensed Operator Regualification Program," Appendix A, "Checklist for Evaluating Facility Testing Material," and Appendix B, "Suggested Interview Topics."

The NRC region-based inspectors conducted a review of recent operating history documentation found in inspection reports, licensee event reports, CAP, and the most recent NRC plant issues matrix. The inspectors also reviewed specific events from Entergy's CAP which indicated possible training deficiencies, to review whether they had been addressed appropriately. The NRC senior resident inspector was also consulted for insights regarding licensed operators' performance. These reviews did not detect

any operational events that were indicative of possible training deficiencies.

The operating tests for three weeks of the exam cycle (Teams 2A, 2B, and 2C) were reviewed for quality and performance.

On December 9, 2010, the results of the annual operating tests for year 2010 and the written exam for 2009 were reviewed to ensure pass fail rates were consistent with the guidance of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and IMC 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process." The review verified the following:

- Crew pass rates were greater than 80% (Pass rate was 100%);
- Individual pass rates on the biennial written exam (administered in 2009) were greater than 80% (Pass rate was 100%);
- Individual pass rates on the job performance measures of the operating exam were greater than 80% (Pass rate was 97.35%); and
- More than 75% of the individuals passed all portions of the exam (94.7% of the individuals passed all portions of the examination).

NRC observations were made on the dynamic simulator exams and job performance measures (JPM) administered during the week of September 27, 2010. These observations included facility evaluations of crew and individual performance during the dynamic simulator exams and individual performance of five JPMs. Nine remediation plans for crew/individual failures were reviewed to assess the effectiveness of the remedial training. Five license activation records were reviewed to ensure that 10 CFR 55.53 license conditions and applicable program requirements were met.

Operators, instructors, and training/operation's management were interviewed for feedback on their training program and the quality of training received. Simulator performance and fidelity were reviewed for conformance to the reference plant control room. A sample of records for requalification training attendance, program feedback, reporting, and medical examinations were reviewed for compliance with license conditions, including NRC regulations.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 4 samples)

a. Inspection Scope

The inspectors reviewed the following areas to assess the effectiveness of maintenance activities on system performance and reliability. The inspectors reviewed, when applicable, system health reports, CAP documents, maintenance work orders, and maintenance rule basis documents to ensure performance problems were being identified and properly evaluated within the scope of the maintenance rule. For each sample selected, the inspectors reviewed whether the structure, system, and component (SSC) was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and reviewed whether the (a)(2) performance criteria established by Entergy staff were

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appropriate. For SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors determined if Entergy staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- 21 reactor coolant pump high bearing temperatures;
- Central control room fan trips;
- Containment isolation valves pressure control valves (PCVs) 1191 and 1192 failures; and
- Main steam bypass valve MS-55D.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of four quarterly maintenance effectiveness samples as defined in NRC Inspection Procedure 71111.12.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities affecting risk significant and safety related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- October 13, 2010, elevated risk due to 22 EDG planned maintenance, and 21 SWP and the station auxiliary transformer tap changer out for unplanned maintenance;
- October 14, 2010, elevated risk due to 26 isophase fan and 480 volt undervoltage alarm testing, and 21 SWP and 21 primary water pump out of service for unplanned maintenance;
- November 4, 2010, elevated risk due to 23 charging pump and 25 SWP out of service for unplanned maintenance;
- November 14, 2010, elevated shutdown risk during restoration of electrical feeder 96952; and
- December 1, 2010, elevated risk due to 22 auxiliary boiler feed pump out of service for planned testing and severe weather.

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Entergy personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Entergy personnel performed unplanned or emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst or shift technical advisor, to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements

and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of five maintenance risk assessments and emergent work control inspection samples as defined in NRC Inspection Procedure 71111.13.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15 – 3 samples)

a. Inspection Scope

The inspectors reviewed the following issues:

- September 4, 2010, impact on containment sump from items found inside containment;
- September 23, 2010, scaffold impact on 25 SWP piping; and
- October 12, 2010, EDGs heat exchanger thermal relief valves SWN-63.

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to Entergy's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that Entergy personnel were identifying and correcting any deficiencies associated with operability evaluations.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of three operability evaluations inspection samples as defined in NRC Inspection Procedure 71111.15.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)Temporary Modificationsa. Inspection Scope

The inspectors reviewed the following temporary modification to verify that the safety functions of affected safety systems were not degraded:

On October 10, 2010, Entergy staff implemented WO 247503 / 2-TOP-016 on 22 EDG to determine the number of successive starts available with the starting air receiver at 250 psig, and determine the minimum air start pressure for a single diesel start.

The inspectors reviewed the temporary modification and the associated safety evaluation screening against the system design bases documentation, including the UFSAR and the TSs, to verify that the modification did not adversely affect the system operability/availability. The inspectors also reviewed whether the installation and restoration were consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors reviewed whether the temporary modification was identified on control room drawings, appropriate tags were placed on the affected equipment, and Entergy personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one sample for temporary plant modifications as defined in NRC Inspection Procedure 71111.18.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)a. Inspection Scope

The inspectors reviewed the following post-maintenance tests (PMTs) to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- October 8, 2010, Appendix R DG after jacket water leak repair;
- October 13, 2010, 22 EDG after maintenance;
- October 27, 2010, 21 SWP after motor replacement;
- October 29, 2010, 24 SWP 480 volt breaker after maintenance;
- November 2, 2010, 21 S/G level channel 'C' after repairs for failing off scale low; and
- November 10, 2010, Wide range effluent radiation monitor R-27 after maintenance.

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities to determine (as applicable) the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and

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demonstrated operational readiness; and that test instrumentation was appropriate. The inspectors evaluated the activities against the TSs, the UFSAR, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with PMTs to determine whether Entergy personnel were identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of six PMT inspection samples as defined in NRC Inspection Procedure 71111.19.

b. Findings

Inadequate Compensatory Measures for Out-of-Service Plant Vent Process Radiation Monitor

Introduction. The inspectors identified a Green NCV of 10 CFR 50.54, "Conditions of Licenses," paragraph (q), because Entergy staff did not implement adequate compensatory measures when the R-27 plant vent process radiation monitor, which is used for emergency action level (EAL) classification, was taken out of service. Specifically, between October 25, 2010 and November 24, 2010, the R-27 monitor was out of service for repair following preventive maintenance with inadequate compensatory measures.

Description. On October 25, 2010, Entergy personnel removed the R-27 plant vent process radiation monitor from service for a two year preventive maintenance (PM) activity. The R-27 monitor is used by operators in the emergency plan for identifying a radiological release and making EAL declarations and is listed in the Technical Requirements Manual (TRM) for post accident monitoring. Entergy operators entered TRM action statement 3.3.G, which requires R-27 restoration to operable status within seven days. The PM activity was delayed because a part needed for replacement was not readily available. On November 1, 2010, the seven-day TRM action statement was exceeded, for which the required actions were to initiate an alternative method of monitoring the appropriate parameters and prepare a corrective action program report in 14 days. Entergy personnel established a compensatory measure by utilizing the R-44 plant vent radiation monitor which also monitors plant vent flow.

On November 2, 2010, the inspectors questioned the station's use of R-44 to compensate for the R-27, because the R-44 process radiation monitor has a lower indicating range and would only support declaring an Unusual Event and not higher EAL classifications. The inspectors concluded Entergy personnel had not identified this limitation of the R-44 monitor. Entergy procedure IP-EP-AD40, "Equipment Important to Emergency Response," provides compensatory measures when R-27 monitor is unavailable, for both the monitor's roles of radiological release identification (including EAL thresholds) and dose assessment. For the release identification, the procedure directed operators to perform manual sampling in accordance with the unit's TS. However, as a result of further inspector questions, Entergy staff determined this information had been removed from the TS. The inspectors determined that a number

of instruments used for EP functions listed in procedure IP-EP-AD40 also had the TS referenced as an alternative measure for their use.

Following the inspectors' initial questioning, EP department personnel provided the operators contingency guidance to be implemented when the R-27 monitor is out of service. This guidance implemented procedures IP-EP-310, "Dose Assessment," and IP-EP-115, "Emergency Plan Forms," using remotely installed radiation monitors or hand-held teletectors, and mathematical conversion equations, to provide plant vent release information. The inspectors questioned whether Entergy personnel could verify that Site Area Emergency or General Emergency area dose rates would allow for manual measurement of the plant vent dose rates. Entergy personnel subsequently affirmed that the process was implementable under all design-basis conditions and issued appropriate direction to the operating crews in an interim guidance document on November 24, 2010. Entergy personnel documented the need for interim guidance when the R-27 monitor is out of service in CR-IP2-2010-06718, and the need to revise procedure IP-EP-AD40 to update the alternative measures for instrumentation needed for EAL actions in CR-IP2-2010-06721.

The inspectors determined that not having R-27 monitor radiation readings available for event classification, without adequate compensatory measures, was a failure to maintain the requirements of the IPEC Emergency Plan. The inspectors determined the final version of the interim guidance for operations personnel was adequate. The inspectors determined that the IPEC EAL scheme has redundant EALs based on the status of fission product barriers, the failure of reactor fuel, and the condition of the main containment, that would result in equivalent classifications for postulated accident events above an Unusual Event level. The inspectors determined these capabilities provided assurance that any delay in obtaining plant vent process radiation monitor readings by manual methods when the R-27 monitor was unavailable would not have affected the outcome of protecting the health and safety of the public or of station personnel.

Analysis. The performance deficiency associated with this finding was that Entergy personnel did not provide adequate compensatory measures for when the R-27 plant vent monitor was removed from service. This finding is more than minor because it was associated with the ERO attribute of the EP Cornerstone and affected the cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the public health and safety in the event of a radiological emergency.

In accordance with Inspection Manual Chapter (IMC) 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the inspectors determined the finding was of very low safety significance (Green). Specifically, the inspectors utilized IMC 0609, Appendix B, Section 4.4 and Sheet 1, "Failure to Comply," and determined that the failure to comply with an aspect of the Emergency Plan related to event classification (10 CFR 50.47(b)(4)) was a RSPS problem; but it was not a RSPS functional failure of the IPEC event classification process. The inability to determine the release rate through the main stack plant vent when the R-27 monitor was out of service was a failure to comply with the regulations; however, redundant EALs in the IPEC Unit 2 EAL would have resulted in equivalent classifications for postulated accident events above an Unusual Event level. These capabilities provided assurance that this performance deficiency ultimately would not have affected the outcome of protecting the health and safety of the public or of station personnel.

This finding has a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action program attribute of taking appropriate corrective actions to address safety issues in a timely manner. Specifically, Entergy staff did not provide for appropriate emergency planning compensatory corrective actions when the R-27 monitor was removed from service. [P.1(d) per IMC 0310]

Enforcement. 10 CFR 50.54, "Conditions of Licenses," paragraph (q) requires, in part, that a licensee "shall follow and maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E of this part." 10 CFR 50.47(b)(4) requires, in part, that "a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee."

Contrary to the above, from October 25, 2010 to November 24, 2010, Entergy personnel did not have an adequate method or equipment in place, under certain accident conditions, for identifying and classifying an offsite release through the plant main vent when the R-27 monitor was out of service. As a result, this condition could have resulted in an unnecessary delay in identifying plant vent releases that would have resulted in the declaration of an emergency event above the Unusual Event level. By failing to meet the requirements of 10 CFR 50.47(b)(4), Entergy was in violation of 10 CFR 50.54(q) for not properly maintaining the conditions of the IPEC Emergency Plan. Entergy personnel corrected this deficiency by issuing adequate guidance to the Unit 2 operating crews when the R-27 monitor was removed from service. Because this finding is of very low safety significance and was entered into Entergy's CAP as CR-IP2-2010-06721, consistent with Section 2.3.2 of the NRC Enforcement Policy, this violation is being treated as a NCV: **NCV 005000247/2010005-01, Inadequate Compensatory Measures for Out-of-Service Plant Vent Process Radiation Monitor.**

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

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for the Unit 2 unplanned maintenance outage to replace the 21 main transformer, conducted November 7 - 23, 2010. The inspectors' review considered whether Entergy personnel appropriately considered risk, industry experience, and previous site performance in developing and implementing a plan that assured maintenance of defense in depth with regards to reactor safety. During the maintenance outage, the inspectors observed portions of the shutdown and cooldown processes and monitored Entergy operator controls over the outage activities listed below:

- Configuration management, including maintenance of defense in depth, commensurate with the outage safety plan for key safety functions and compliance with the applicable TSs when taking equipment out of service;
- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing;
- Status and configuration of electrical systems to ensure that TSs and outage planning requirements were met, and controls over switchyard activities were appropriate;
- Monitoring of decay heat removal processes, systems, and components;

- Controls over activities that could affect reactivity;
- Maintenance of secondary containment as required by the TS;
- Startup and ascension to full power operation, tracking of startup prerequisites;
- Station personnel identification and resolution of problems related to maintenance outage activities; and
- Work hours for fatigue concerns.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one other outage inspection sample as defined in NRC Inspection Procedure 71111.20.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 5 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk significant SSCs, to assess whether test results satisfied TSs, UFSAR, technical requirements manual (TRM), and Entergy procedure requirements. The inspectors verified that test acceptance criteria were sufficiently clear; tests demonstrated operational readiness and were consistent with design basis documentation; test instrumentation had accurate calibrations and appropriate range and accuracy for the application; tests were performed as written; and applicable test prerequisites were satisfied. Following the tests, the inspectors considered whether the test results supported conclusions that equipment was capable of performing the required safety functions. The following surveillance tests were reviewed:

- September 1, 2010, 2-PT-Q017C, alternate safe shutdown supply verification to 23 component cooling water pump;
- September 12, 2010, 2-OSP-4.1.2, support procedure – component cooling system operation;
- October 18, 2010, 2-PT-Q028A, 21 residual heat removal pump test;
- October 18, 2010, 2-PT-Q013, data sheet 43, 22 safety injection (SI) pump tie to 21 SI pump discharge valve in-service valve test; and
- December 17, 2010, reactor coolant system (RCS) leak rate surveillance test.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of five surveillance testing inspection samples as defined in NRC Inspection Procedure 71111.22.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness (EP)

1EP6 Drill Evaluation (71114.06 – 1 sample)

a. Inspection Scope

The inspectors evaluated operator performance during a simulator scenario conducted on October 13, 2010, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by Entergy staff in order to evaluate Entergy's critique and to verify whether the Entergy staff was properly identifying weaknesses and entering them into the CAP.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one sample as defined in NRC Inspection Procedure 71114.06.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational/Public Radiation Safety (PS)

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

a. Inspection Scope

Inspection Planning

The inspectors reviewed all licensee performance indicators (PIs) for the Occupational Exposure cornerstone for follow up and reviewed the results of the most recent radiation protection program audit.

Contamination and Radioactive Material Control

The inspectors selected three sealed sources from the licensee's inventory records, verified that the sources were accounted for, and have been leak tested within the past six months. The inspectors verified that there have not been any source transfer transactions since the last inspection involving nationally tracked sources.

Radiological Hazards Control and Work Coverage

During tours of the facility and review of ongoing work, the inspectors evaluated ambient radiological conditions, verified that existing conditions were consistent with posted surveys, RWPs, and worker briefings, as applicable. During available job performance observations, the inspectors verified the adequacy of radiological controls, radiation

protection job coverage, contamination controls, and evaluated the licensee's use of electronic pocket dosimeters in high noise areas. The inspectors verified that dosimeters of legal record were being placed on the individual's body consistent with monitoring the highest expected dose due to external radiation sources.

During this inspection, there were no active work activities within airborne radioactivity areas with the potential for individual worker internal exposures for evaluation. The inspectors examined the licensee's physical and programmatic controls for highly activated or contaminated materials (nonfuel) stored within spent fuel and other storage pools and verified that appropriate controls were in place to preclude inadvertent removal of these materials from the pools. The inspectors conducted selective inspection of posting and physical controls for high radiation areas (HRAs) and very high radiation areas (VHRAs) to verify conformance with TS and procedural requirements.

Risk Significant High Radiation Area and Very High Radiation Area Controls

The inspectors reviewed the controls and procedures for high risk HRAs and VHRAs. The inspectors verified that any changes to licensee procedures did not substantially reduce the effectiveness and level of worker protection. The inspectors discussed with a health physics supervisor the controls in place for special areas that have the potential to become VHRAs during certain plant operations to determine if these plant operations include prior communication with the HP organization to allow for timely actions to properly post, control, and monitor the radiation hazards including re-access authorization.

Radiation Worker Performance

During job performance observations, the inspectors observed radiation worker performance with respect to radiation work permit requirements to determine if workers are aware of the radiological conditions in their workplace and if their work performance reflects the conditions of the radiation work permit requirements. The inspectors reviewed several radiological problem reports since the last inspection that include the cause of the event to be attributable to human performance errors. This review included a determination of any similar observable patterns and effectiveness review of any prior corrective actions taken by the licensee to resolve any similar prior radiological problems.

Radiation Protection Technician Proficiency

During job performance observations, the inspectors observed the performance of radiation protection technicians with respect to applicable radiation work permit requirements to determine if technicians were aware of the radiological conditions in their workplace, the RWP controls/limits in place and if their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities. The inspectors reviewed several radiological problem reports since the last inspection that include the cause of the event to be attributable to radiation protection technician error. This review included a determination of any similar observable patterns and effectiveness review of any prior corrective actions taken by the licensee to resolve any similar prior radiological problems.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one sample as defined in NRC Inspection Procedure 71124.01.

b. Findings

No findings were identified.

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

a. Inspection Scope

Inspection Planning

The inspectors reviewed site procedures associated with maintaining occupational exposures ALARA, including a review of processes used to estimate and track exposures from specific work activities.

Radiological Work Planning

Based on radiation work permit outage work activity collective exposure results from the Unit 2 Spring 2010 refueling outage, the inspectors selected for review those work activities that resulted in a dose of 5 person-rem or greater. This review included the basis of the exposure estimates with reference to historical performance metrics, and exposure mitigation requirements planned for these outage tasks.

With respect to the outage work activity samples, the inspectors compared the actual exposure results with the estimated exposure established in the licensee's ALARA plans for these work activities. The inspectors also compared the person-hour estimates provided by maintenance planning and other groups to the radiation protection group with the work activity person-hour actual results, to evaluate the performance results. The inspectors determined the reasons (e.g., failure to adequately plan the activity, failure to provide sufficient work controls) for any inconsistencies between intended and actual work activity doses. The inspectors also determined if any identified exposure overrun causes were identified and entered into Entergy's CAP.

Verification of Dose Estimates and Exposure Tracking Systems

The Unit 2 Spring refueling outage ALARA work packages that resulted in greater than 5 person-rem were reviewed to include the assumptions and basis (including dose rate and man-hour estimates) for their collective exposure estimates. Applicable procedures were reviewed to determine the methodology for estimating exposures for specific work activities and determining the intended dose outcome.

The inspectors verified for the selected work activities that the licensee has established measures to track, trend, and if necessary to reduce, occupational doses for ongoing work activities and that criteria are established to prompt additional reviews and/or additional ALARA planning and controls. The inspectors evaluated the licensee's method of adjusting exposure estimates when unexpected changes in scope or emergent work were encountered. The inspectors determined if adjustments to

exposure estimates (intended dose) were based on sound radiation protection and ALARA principles or if they were only adjusted to account for failures to control the work.

Source Term Reduction and Control

Through a review of licensee records, the inspectors evaluated the historical trends and current status of significant tracked plant source terms known to contribute to elevated facility aggregate exposure and reviewed the licensee's contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

Radiation Worker Performance

The inspectors observed radiation worker and radiation protection technician performance during work activities being performed in radiation areas and high radiation areas. The inspectors determined if workers demonstrated the ALARA philosophy in practice and whether there were any procedure compliance issues and whether the training and skill level of the radiation workers was sufficient with respect to the radiological hazards and the work tasks involved.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one sample as defined in NRC Inspection Procedure 71124.02.

b. Findings

.1 Inadequate Work Planning Control Relative to Regenerative Heat Exchanger Permanent Shielding Modification That Resulted in Additional Unplanned Collective Exposure

Introduction. A Green self-revealing finding was identified because Entergy personnel did not adequately plan and control work activities related to a regenerative heat exchanger permanent shielding modification in accordance with RWP 20102537, "2R19 Permanent Regenerative Heat Exchanger Shielding" which resulted in significant unplanned exposure.

Description. During Refueling Outage 19, Entergy's RWP 20102537 provided the ALARA plan and dose estimate standard for the regenerative heat exchanger permanent shielding modification. The regenerative heat exchanger permanent shielding modification dose exceeded the planned dose estimate in RWP 20102537. Entergy personnel determined the dose estimates were exceeded due to inadequate work activity planning and control. The lack of in-field walkdowns prior to designing the modification resulted in as-found interferences, and due to limited field supervision, the resulting construction modification was performed in a posted high radiation area. In addition, the construction workers performing the work did not have an assigned project lead to direct the in-field work, which resulted in delays in completing the modification within time estimates as assumed in the dose planning. These factors resulted in additional collective exposure that Entergy could have reasonably avoided had sufficient work activity planning and additional in-field supervision occurred.

The inspectors reviewed RWP 20102537 and determined the actual job site conditions for installation of the regenerative heat exchanger permanent shielding were not

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adequately evaluated for interferences and when revealed, measures were not taken by Entergy personnel to prefabricate the modifications outside of a high radiation area, resulting in additional unnecessary personnel exposure. The original exposure work estimate was 6.8 person-rem. In order to provide allowance for higher dose rates than anticipated, the original estimate was increased to 8.0 person-rem, however the actual work activity exposure was 17.189 person-rem (115% greater than the revised exposure estimate). This issue was entered into Entergy's CAP as CR-IP2-2010-02817.

Analysis. The performance deficiency associated with this finding was that Entergy personnel did not adequately plan and control work activities related to a regenerative heat exchanger permanent shielding modification in accordance with RWP 20102537. This finding is more than minor because it is associated with the program and process attribute of the Occupational Radiation Safety cornerstone and affected the cornerstone objective of ensuring the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine reactor operations. It is also similar to the more than minor example 6.j provided in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," since it involves an actual collective exposure greater than 5 person-rem and exceeded the planned, intended dose by more than 50%.

Using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to have very low safety significance (Green) because the finding involved an ALARA planning issue and the 3-year rolling average collective dose history was less than 135 person-rem (52.261 person-rem average annual exposure for 2007-2009).

The finding has a cross-cutting aspect in the area of human performance associated with the work control attribute because Entergy's planned work activities did not adequately incorporate the job site interferences and their resolution in accordance radiological safety. [H.3(a) per IMC 0310]

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. Because this finding does not involve a violation, has very low safety significance, and was entered into Entergy's CAP as CR-IP2-2010-02817, it is identified as a finding: **FIN 05000247/2010005-02, Inadequate Work Planning Control Relative to Regenerative Heat Exchanger Permanent Shielding Modification That Resulted in Additional Unplanned Collective Exposure.**

.2 Inadequate Work Coordination Relative to Reactor Cavity Liner Repair That Resulted in Additional Unplanned Collective Exposure

Introduction. A Green self-revealing finding was identified because Entergy personnel did not adequately plan and control work activities related to reactor cavity liner repair in accordance with RWP 20102530, "2R19 Cavity Liner Repair" which resulted in significant unplanned collective exposure.

Description. During Refueling Outage 19, Entergy's RWP 20102530 provided the ALARA plan and dose estimate standard for the work activity. The Unit 2 reactor cavity liner repair dose exceeded the planned dose estimate in RWP 20102530. Entergy personnel determined the dose estimate was exceeded due to inadequate work coordination and ALARA plan implementation. Schedule delays resulted in the intended

contractor vendor not being able to conduct the work as planned, resulting in the use of back-up workers to perform the cavity sealant removal work, which resulted in additional person-hours to complete this work. Also due to schedule delays, the reactor head shielding was removed while the cavity liner repair work was still in progress, which resulted in higher than planned exposures. In addition, due to the delayed and compressed schedule, the planned shielding for the cavity boring work was not applied as planned, which resulted in higher exposures.

The inspectors reviewed RWP 20102530 and determined the additional person-hours to perform the reactor cavity sealant removal, the removal of reactor head shielding, and failure to provide the planned cavity boring shielding resulted in additional collective exposure that could have been avoided had sufficient work coordination and work plan implementation been performed. The original exposure work estimate was 3.09 person-rem. For purposes of this analysis, in order to provide allowance for higher dose rates than anticipated, the original estimate was increased to 3.635 person-rem. When compared to the actual work activity exposure of 7.058 person-rem, the results were 94% greater than the revised exposure estimate. This issue was entered into Entergy's CAP as CR-IP2-2010-02817.

Analysis. The performance deficiency associated with this finding was that Entergy personnel did not adequately plan and control work activities related to the reactor cavity liner repair in accordance with RWP 20102530. This finding is more than minor because it is associated with the program and process attribute of the Occupational Radiation Safety cornerstone and affected the cornerstone objective of ensuring the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine reactor operations. It is also similar to the more than minor example 6.j provided in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," since it involves an actual collective exposure greater than 5 person-rem and exceeded the planned, intended dose by more than 50%.

Using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the finding was determined to have very low safety significance (Green) because the finding involved an ALARA planning issue and the 3-year rolling average collective dose history was less than 135 person-rem (52.261 person-rem average annual exposure for 2007-2009).

The finding has a cross-cutting aspect in the area of human performance associated with the work control attribute because Entergy did not coordinate and implement work activities as planned, keeping personnel apprised of work status and schedule delays, which resulted in significant dose overrun. [H.3(b) per IMC 0310]

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. Because this finding does not involve a violation, has very low safety significance, and it was entered into Entergy's CAP as CR-IP2-2010-02817, it is identified as a finding: **FIN 05000247/2010005-03, Inadequate Work Coordination Relative to Reactor Cavity Liner Repair That Resulted in Additional Unplanned Collective Exposure.**

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 5 samples)

.1 Mitigating Systems Performance Index – Heat Removal System (MS08)

a. Inspection Scope

The inspectors sampled Entergy submittals for the mitigating systems performance index – heat removal system PI for the period from October 2009 through September 2010. To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, "Regulatory Assessment Performance Indicator Guideline." The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, mitigating systems performance index derivation reports, and NRC integrated inspection reports to validate the accuracy of the submittals. The inspectors also reviewed Entergy's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

Specific documents reviewed are described in the attachment to this report. These activities constitute completion of one mitigating systems performance index – heat removal system sample as defined in NRC Inspection Procedure 71151.

A correction to NRC Inspection Report 05000247/2010004 dated November 10, 2010: Mitigating Systems Performance Index – Residual Heat Removal System (MS09) was reviewed instead of Heat Removal System (MS08).

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index – Cooling Water Systems (MS10)

a. Inspection Scope

The inspectors sampled Entergy submittals for the mitigating systems performance index – cooling water systems for the period from October 2009 through September 2010. To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline." The inspectors reviewed Entergy's operator narrative logs, issue reports, event reports, mitigating systems performance index derivation reports, and NRC integrated inspection reports to validate the accuracy of the submittals. The inspectors also reviewed Entergy's issue report database to determine if problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

Specific documents reviewed are described in the attachment to this report. These activities constitute completion of one mitigating systems performance index – cooling water systems sample as defined in NRC Inspection Procedure 71151.

b. Findings

No findings were identified.

.3 Reactor Coolant System Leakage (BI02)

a. Inspection Scope

The inspectors sampled Entergy submittals for RCS leakage PI for the period from October 2009 through September 2010. To determine the accuracy of the PI data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline." The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals. The inspectors also reviewed Entergy's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified.

Specific documents reviewed are described in the attachment to this report. These activities constitute completion of one RCS leakage sample as defined in NRC Inspection Procedure 71151.

b. Findings

No findings were identified.

.4 Occupational Exposure Control Effectiveness

a. Inspection Scope

The inspectors reviewed implementation of Entergy's Occupational Exposure Control Effectiveness PI Program. Specifically, the inspectors reviewed CRs, and radiological controlled area dosimeter exit logs for the past four calendar quarters (through 3rd quarter 2010). These records were reviewed for occurrences involving locked high radiation areas, very high radiation areas, and unplanned exposures against the criteria specified in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify that all occurrences that met the NEI criteria were identified and reported as PIs.

Specific documents reviewed are described in the attachment to this report. These activities constitute completion of one occupational exposure control effectiveness sample as defined in NRC Inspection Procedure 71151.

b. Findings

No findings were identified.

.5 Radiological Effluent Technical Specification (RETS)/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences

a. Inspection Scope

The inspectors reviewed a listing of relevant effluent release reports for the past four (4) calendar quarters (through 3rd quarter 2010), for issues related to the public radiation safety PI, which measures radiological effluent release occurrences per site that exceed 1.5 mrem/quarter whole body or 5.0 mrem/quarter organ dose for liquid effluents; 5 mrad/quarter gamma air dose, 10 mrad/quarter beta air dose, and 7.5 mrad/quarter for organ dose for gaseous effluents. The review was against applicable criteria specified in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline." The purpose of the review was to verify that occurrences that met the NEI criteria were recognized and identified as PI occurrences. The inspectors reviewed the following documents to ensure the licensee met all requirements of the PI:

- Monthly projected dose assessment results due to radioactive liquid and gaseous effluent releases;
- Quarterly projected dose assessment results due to radioactive liquid and gaseous effluent releases; and
- Dose assessment procedures.

Specific documents reviewed are described in the attachment to this report. These activities constitute completion of one RETS/ODCM radiological effluent occurrences sample as defined in NRC Inspection Procedure 71151.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152 – 2 samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that issues were being entered into Entergy's CAP at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP. The inspectors reviewed attributes that included: (1) complete and accurate identification of the problem; (2) timely correction, commensurate with the safety significance; (3) evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and (4) classification, prioritization, focus, and timeliness of corrective actions.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an

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integral part of the inspections performed during the quarter. Specific documents reviewed during this inspection are listed in the attachment.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, to identify trends that might indicate the existence of more significant safety issues, as required by Inspection Procedure 71152, "Identification and Resolution of Problems." The inspectors included in this review, repetitive or closely related issues that may have been documented by Entergy outside of the CAP, such as trend reports, PIs, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or CAP backlogs. The inspectors also reviewed the Entergy CAP database for the first and second quarters of 2010, to assess CRs written in various subject areas (equipment problems, human performance issues), as well as individual issues identified during the NRCs daily CR review (Section 4OA2.1). The inspectors reviewed the Entergy quarterly trend report for the first quarter of 2010, conducted under LO-IP3LO-2010-00049 to verify that Entergy personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one in-depth problem identification and resolution sample as defined in NRC Inspection Procedure 71152.

b. Findings and Observations

No findings of significance were identified.

The inspectors evaluated a sample of departments that are required to provide input into the quarterly trend reports, which included system engineering and operations departments. This review included a sample of issues and events that occurred over the course of the past two quarters to objectively determine whether issues either were appropriately considered or ruled as emerging or adverse trends, and in some cases, verified the appropriate disposition of resolved trends. The inspectors verified that these issues were addressed within the scope of the CAP, or through department review and documentation in the quarterly trend report for overall assessment. For example, the inspectors noted that consistent with an increase in the human performance error rate that Entergy personnel had appropriately identified "human performance error rate" as a monitored trend with ongoing corrective actions to address this long-standing issue. In other cases, the inspectors verified for resolved trends, such as vital area door hardware deficiencies, that applicable success criteria were identified to ensure successful resolution of adverse trends.

Additionally, the inspectors noted an apparent increase in the CRs associated with the decreasing pressure in the SI tanks, and while a sample review indicated Entergy plans further troubleshooting of this issue, the cause of the decreasing pressure has not been

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identified. The inspectors reviewed the trend and determined Entergy personnel had appropriately developed WOs to troubleshoot this issue and no current operability issue existed because SI tank pressure was within the required band.

The inspectors also observed an apparent increase in the number of inadequacies with operability determinations. The inspectors noted some operability determinations included insufficient detail to prove operability of safety-related components without further discussions with operations and engineering personnel. For example, CR-IP2-2010-05173 and CR-IP2-2010-07232 for fuel oil leaks on the 22 and 23 emergency diesel generators did not provide sufficient information to ensure adequate fuel oil was available during a design basis accident for the mission time of the diesels with these fuel oil leaks. These operability determinations were revised and addressed in common CR, CR-IP3-2010-02576. Also, CR-IP2-2010-05378 for a 23 battery charger ground did not provide an operability determination until questioned by the inspectors. An operability determination was performed to ensure the 23 battery charger would perform as designed with these grounds. Since no equipment was actually inoperable, and there was no appreciable reduction in safety margin, these issues are considered minor. The inspectors noted that these inadequate operability determinations had not been recognized by Entergy staff as a specific emerging or adverse trend.

3. Annual Sample - Aggregate Impact of Operator Workarounds

a. Inspection Scope

The inspectors conducted a review of the aggregate impact of operator burdens and workarounds. The inspectors reviewed Entergy's implementation of procedures OAP-45, "Operator Burden Program." The inspectors conducted control room walkdowns and interviewed plant operators to determine the impact of deficiencies on operator response to plant events. Additionally, the inspectors reviewed operator logs, CRs and performed system walkdowns to verify that there were no risk significant operator actions that had not been evaluated by Entergy personnel.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one in-depth problem identification and resolution sample as defined in NRC Inspection Procedure 71152.

b. Findings and Observations

No findings were identified.

The inspectors verified that operator workarounds and burdens were entered into the CAP at an appropriate threshold and that corrective actions were planned or taken commensurate with their safety significance.

4. (Closed) Unresolved Item 05000247/2010-002-02, Refueling Cavity Leakage into Containment

a. Inspection Scope

The inspectors completed an evaluation of unresolved item (URI) 05000247/2010002-02 regarding historical refueling cavity leakage into containment that occurs during reactor refueling activities for approximately two weeks every other year. The URI documented that, during refueling outages from 1993 to the present, borated water (containing approximately 2700 ppm boric acid) had leaked from the reactor refueling cavity into the lowest level of containment at a rate of two to ten gallons per minute. The URI was opened because inspectors concluded additional information was required from Entergy personnel related to their assessment of this condition. The central item discussed in the URI was that Entergy technical staff had not evaluated the impact of the borated refueling cavity water on the dissimilar metal welds between the stainless steel liner and the carbon steel studs that attach the liner to the concrete wall. In addition, the inspectors evaluated whether the Entergy corrective action process was appropriately implemented for identifying, evaluating, and resolving this issue.

The inspectors met with Entergy personnel to discuss the open item described above. Entergy personnel provided the inspectors with an engineering evaluation to address the central issue of the URI – the impact of the borated water on the liner attachment welds and carbon steel hardware. Entergy personnel also provided the inspectors with information and documentation to address related inspector questions. The inspectors reviewed the information provided, conducted additional meetings with Entergy personnel to determine whether Entergy technical staff had adequately provided the necessary information for the inspectors to address closure of the URI. Further details of the inspectors' review of this URI are provided below.

b. Findings and Observations

The URI documented that, during refueling outages from 1993 to the present, borated water had leaked from the reactor refueling cavity into the lowest level of containment at a rate of two to ten gallons per minute. Additional information from Entergy's CAP documented that the epoxy repairs performed in 1993 were effective, and there were no documented liner plate epoxy repair failures revealed until 2000.

In response to the URI (the impact of the borated water on the liner attachment welds and carbon steel hardware), Entergy engineering personnel performed an engineering evaluation that determined there were no structural concerns due to the leaking refueling cavity water on liner welds and hardware. The evaluation was documented in Entergy's CAP under CR-IP2-2008-01629. Specific data used by station personnel to reach this conclusion included the results of several core bores that were taken from concrete and reinforcing steel, visual observations of the dissimilar welds and carbon steel hardware, results of water samples taken during 2R19 showing very low levels of chlorides, and results of an EPRI study showing borated water does not aggressively attack carbon steel in the temperature range to which these components are exposed.

The inspectors reviewed Entergy's evaluation and determined that Entergy personnel had adequately addressed the open item regarding the impact of the borated water on the liner attachment welds and carbon steel hardware. Further, with respect to the

structural integrity of the reactor cavity liner and concrete, the inspectors reviewed: 1) core samples that were taken from reactor cavity concrete structure; 2) photographs of additional core samples and imbedded rebar; and 3) the licensee and vendor evaluations including petro graphic examination of the concrete aggregate. The inspectors also reviewed completed License Renewal actions as accepted by the NRC Staff's SER for various letters submitted by Entergy up to and including June 2009. Specifically, the following items for 2010 were reviewed and evaluated: 1) three core samples of concrete from the observed leakage location to determine the compressive strength of the concrete and pH value as well as boron and chloride concentration in concrete and water; and 2) visual examination of the exposed reinforcements.

The inspectors' independent review did not identify unusual indications or degradation of concrete and re-bar. The inspectors determined that core samples appeared as described by Entergy personnel and the water chemistry was as expected. The inspectors also noted the proper completion of license renewal commitments with respect to concrete core samples and water chemistry analysis of 2010. Further, the inspectors reviewed the report IP-RPT-11-00002 regarding Entergy's conclusion that the Reactor Fueling Cavity and the Fuel Handling Building Concrete retained the structural capacity to fulfill its design and safety function. The inspectors' review determined that Entergy's evaluation was appropriate in its evaluation and conclusion that the design and safety function of the liner was maintained given the current condition and impacts regarding the leakage that occurs during refueling outages. The inspectors also discussed Entergy's plan for the permanent fix and verified that if remediation is unsuccessful for the leakage, then Entergy's corrective action process has provisions to continue to re-inspect the concrete, re-bar, and the leaking water prior to extended operation.

As part of the inspectors' corrective action review of this condition, which included review of plant drawings, inspectors questioned the safety classification of the refueling cavity liner. Entergy staff evaluated the liner classification as documented in EC 21400. Entergy staff's EC evaluation determined that the refueling cavity liner did not meet the requirements to be classified as a safety-related component. However, Entergy engineers determined the cavity liner met station requirements to be classified as an augmented quality (QP) component, which is an SSC that is not safety-related but may require additional quality level oversight. The Entergy QP designation imposes formal requirements on liner design, materials, and work methods to maintain greater control over liner-related activities. The inspectors reviewed the EC and verified Entergy personnel had followed their procedures and processes for determining the safety classification of the liner.

Additionally, inspectors questioned whether the wetted SSCs were being properly addressed in accordance with procedure EN-DC-319, "Inspection and Evaluation of Boric Acid Leaks." The inspectors noted that procedure EN-DC-319 required, "For non-white, wet, or excessive leaks, a BAC [Boric Acid Corrosion] Evaluator shall evaluate the leak using guidance established in Attachment 9.4." The inspectors noted that, contrary to this procedural requirement, Entergy technical staff had not completed an Attachment 9.4 evaluation for the wetted components in the 46 foot level of containment. Entergy personnel documented this issue as CR-IP2-2010-02628 and completed Attachment 9.4. Using the EPRI Boric Acid Guidebook, engineering personnel calculated the expected corrosion rates for the given temperature range and time duration of exposure. The evaluation determined that, due to the moderate

temperatures and limited exposure time (wetting only occurs during cavity flood up, which is less than three weeks every two years), the pumps, valves, piping, associated components and their supports would not be significantly impacted by boric acid corrosion. The inspectors reviewed Entergy's evaluation and determined that it adequately addressed the impact of the refueling cavity leakage on the equipment in the 46 foot level of containment. In addition, the inspectors conducted several walkdowns of the 46 foot level of containment during 2R19 and verified that the SSCs were not experiencing external corrosion due to the borated water. The inspectors also ensured Entergy personnel were following procedure EN-DC-319 to review and evaluate any dry boric acid found on these components at the start of each refueling outage.

The inspectors determined that not following the requirements of procedure EN-DC-319 was a performance deficiency. Specifically, Entergy technical staff did not evaluate the wet boric acid leak on the 46 foot level of containment until questioned by the NRC. The inspectors reviewed this performance deficiency in accordance with NRC IMC 0612 Appendix B and determined that it constituted a performance deficiency of minor significance because there was no safety impact on equipment, and because Entergy engineers performed evaluations of the dry boric acid accumulated throughout the cycle at the beginning of each refueling outage.

The inspectors further reviewed procedure EN-LI-102, "Corrective Action Process," Step 5.2.e, which states, "Employees are required to initiate condition reports for adverse conditions." Attachment 9.2 of this procedure gives examples of adverse conditions such as "Conditions affecting a safety related, quality related or trip sensitive system caused by a deficiency in characteristic, documentation or procedure that renders the quality of an item unacceptable or indeterminate. The inspectors reviewed procedure EN-OP-104, "Operability Determination Process," Step 5.1.5, "SSCs warrant functionality assessments within the processes used to address degraded and nonconforming conditions because they perform specified safety functions described in the UFSAR." The UFSAR Section 9.5.1.4, "Protection Against Radioactivity Release from Spent Fuel and Waste Storage," states, "The reactor cavity, refueling canal and spent fuel storage pit are reinforced concrete structures with a seam-welded stainless steel plate liner. These structures are designed to withstand the anticipated earthquake loadings as seismic Class I structures so that the liner prevents leakage even in the event the reinforced concrete develops cracks."

The inspectors identified a performance deficiency because Entergy personnel did not fully implement procedures EN-LI-102 and EN-OP-104. Specifically, while condition reports were initiated for the leak each refueling outage when they occurred, Entergy personnel did not perform a functional assessment to evaluate the reactor cavity liner leakage each refueling outage when the condition existed. Entergy personnel initiated CR-IP2-2010-06741 and conducted a past functionality assessment. Entergy personnel determined that the leakage condition, when present, was a condition not consistent with the reactor cavity liner's UFSAR described design function; however, Entergy personnel determined the leakage condition did not have a safety impact on the liner's functionality. The inspectors reviewed this performance deficiency in accordance with IMC 0612 Appendix B and determined that it constituted a performance deficiency of minor significance because the non-conforming leakage condition did not have a safety impact on the equipment or the liner attachment welds and carbon steel hardware that support liner functionality. Entergy personnel have developed a recurring step in the outage plan to write a condition report and evaluate the leaking condition, until repaired, to ensure

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there is no impact on equipment. This recurring task is documented in LO-OLI-2010-00140. Entergy personnel continue to implement and evaluate corrective actions (CR-IP2-2008-01629) to correct the liner leakage and restore the condition of the liner to as described in the UFSAR.

In general, based on the review of Entergy's corrective actions for the reactor cavity liner leakage condition, the inspectors concluded that Entergy personnel are following their CAP for evaluating and resolving the leakage. Entergy staff prioritized this issue commensurate with the safety significance of the problem, and for the long term corrective actions, is performing the required yearly periodic assessment. Station personnel have been following their process for identifying and evaluating the dry boric acid residue in accordance with procedure EN-DC-319. However, as described above, the inspectors determined that each refueling outage, site personnel did not specifically screen the leakage appropriately for liner functionality and evaluate the interim wet boric acid conditions.

The inspectors have completed their review of URI 05000247/2010002-02. Two minor performance deficiencies were identified as noted above. Specific documents reviewed during this inspection are listed in the attachment. This URI is closed.

5 Selected Issue Follow-up Inspection

a. Inspection Scope

An inspection was performed at the Entergy corporate office in Jackson, Mississippi on June 14 through 17, 2010, to review the circumstances surrounding missed quality control (QC) verification inspections documented in CR-HQN-2009-01184 and CR-HQN-2010-00013. The issue involved QC verification inspections performed during construction-related activities which were required as part of the Entergy quality oversight and verification programs. The inspection was performed to determine if the licensee had taken corrective actions commensurate with the significance of the identified issues, and to assess the impact, if any, on the operability of plant equipment caused by the missed inspections. This inspection was conducted by inspectors from Regions I, II, and IV, as well as a Senior Program Engineer from the Quality and Vendor Branch of the Office of Nuclear Reactor Regulation (NRR). The inspection covered all NRC-licensed sites owned by Entergy Operations, Inc., including Arkansas Nuclear One, James A. Fitzpatrick, Grand Gulf Nuclear Station, Indian Point Units 2 and 3, Palisades Plant, Pilgrim Nuclear Power Station, River Bend Station, Vermont Yankee, and Waterford 3.

The inspectors reviewed root cause analyses documented in CR-HQN-2009-01184 and CR-HQN-2010-00013, and the results of the licensee's extent of condition reviews and plant impact assessments. The inspectors also independently assessed the potential impacts of the missed inspections on the operability of plant equipment by reviewing all of the examples identified by the licensee, and by independently reviewing completed modifications and work orders to identify additional examples. The inspectors also reviewed the corrective action database to assess reported equipment failures in order to assess whether the failure might have involved missed QC verification inspections.

The inspectors assessed causal factors that may have contributed to missing QC verification inspections. This assessment included reviewing the Entergy Quality

Assurance Program Manual (QAPM) requirements, changes made to the QAPM, and the level of agreement between the QAPM and its implementing procedures.

Specific documents reviewed are listed in the attachment.

b. Findings and Observations

The inspectors identified problems with the implementation of elements of the Quality Assurance (QA) Program that affected the fleet of Entergy Operations Inc., (hereafter referred to as "Entergy") nuclear power plants that are licensed by the NRC. While the plant organizations are NRC licensees, Entergy also has corporate groups which are not NRC licensees that are actively involved in some activities affecting sites, including program and procedure changes. Entergy adopted a business strategy of adopting standard programs and procedures at all fleet plants.

On October 30, 2009, the NRC discussed with Entergy personnel the initial concerns about whether QC verification inspections were being performed consistently for the types of work that require that level of inspection. Both the non-licensed and licensed Entergy organizations responded with an appropriate review of the issues. Entergy's review of work documents that were potentially affected was extensive at each site. Entergy's total review examined over 320 Engineering Change documents and 2676 work orders. Of the 30 work orders identified to have QC verification inspection deficiencies affecting eight safety-related design changes, all 30 were determined by Entergy personnel to have sufficient documentation to provide confidence that the equipment was installed correctly. Specific corrective actions were identified and implemented to ensure that QC verification inspections would be included in current and future work documents, including procedure enhancements.

The information provided to the NRC was used to perform a focused inspection in order to assess the impact of the missed verification inspections at each of the NRC-licensed facilities. The inspection documented below independently assessed the potential impact of missed QC verification inspections on the operability of plant equipment, as well as assessing details of QA Program for the Entergy fleet.

Two findings were identified during this inspection. These findings involved missed QC verification inspections at seven Entergy sites, and the assignment of individuals to the QA Manager position that did not meet the experience and qualification requirements at eight sites. Only the findings impacting Indian Point are described below.

The inspectors concluded that the Entergy fleet organizational structure and Entergy strategy of adopting standardized procedures across the fleet were contributing factors to the findings. Specifically:

- Changes to adopt the standard fleet QA program created a partially conflict with existing requirements for worker qualifications at some sites. The process for creating and revising standardized fleet procedures and programs used to meet NRC requirements must ensure that site-specific regulatory requirements and commitments are properly addressed for all sites; and
- Changes that removed details from existing site-specific QA and QC program implementing procedures while shifting to standardized fleet procedures contributed to the finding involving missed QC verification inspections. Condition reports at

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individual sites regarding problems related to this issue were not recognized collectively as symptoms of a problem with these procedures because they were addressed at the site level.

(1) Failure to Perform Required Quality Control Inspections

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion X, "Inspection," because Entergy personnel did not ensure that quality control verification inspections were consistently included and correctly specified in quality-affecting procedures and work instructions for construction-like work activities as required by the QAP.

Description. In response to the inspectors request for information concerning implementation of the quality oversight and verification programs, the licensee performed a review of a representative sample of engineering changes and work order tasks issued between 2006 and 2009. The licensee's review included performing equipment walkdowns, evaluating rework rates and human error rates, and causes for failures of significant components. Based on the results of these reviews, Entergy initiated CRs at the various sites to document problems with Quality Control (QC) verification activities and failures to perform required QC reviews of safety-related engineering changes and construction related work activities. Entergy's investigation concluded that procedures contained inadequate guidance, which resulted in inconsistent implementation of the QC Program. Specifically, some safety-related design change work orders were not reviewed to determine whether QC verification inspections were required, and some safety-related design change work orders did not include all required QC verification inspections. These examples were documented in CR-HQN-2009-01083, -01084, -01085, -01093, -01096, -01140, -01169, -01170, -01184, and -01188.

Additional findings identified by Entergy's review included:

- Managers in maintenance organizations did not have a detailed understanding of QC responsibilities, required inspections, or what documents required review (CR HQN-2009-01150);
- A weakness was identified in the process for ensuring proper approval of contract QC inspection personnel at all Entergy sites. Procedure EN-QV-111, "Training and Certification of Inspection/verification and examination Personnel," Section 4.0 [1], required that the Manager responsible for Quality Assurance or designee at each location is responsible for approving ANSI N45.2.6 certification of QC inspection personnel. In practice, contract QC inspectors' qualifications were not approved by the QA Manager prior to November of 2009. This was determined to be a minor violation because the ANSI Level III inspector at each site was documenting that the contract QC personnel had the necessary qualifications to perform the inspections for which they were contracted. This issue was entered into the Entergy's CAP as CR-HQN-2009-1091;
- At individual Entergy plants, 27 CRs were written in 2008 and 2009 to document potentially missed QC verification inspections or missed reviews to consider QC verification inspections prior to the NRC engaging Entergy on this issue. Of those, seven were actual missed inspections (CR-RBS-2009-05041, CR-JAF-2008-03648, and CR-PNP-2008-00916 and CR-PNP-2008-03922, CR-PNP-2009-01798, CR-PNP-2009-02059, and CR-PNP-2009-02255). Multiple CRs documented work

package quality issues that impacted the ability to identify appropriate QC verification inspection requirements;

- Two examples of QC programmatic issues were identified, assigned the Entergy headquarters, and not properly addressed (CR-ANO-C-2009-01884, and CR-HQN-2009-00178). These were considered examples of the violation discussed below;
- Although equipment-related QC CRs were addressed appropriately, QC programmatic issues were not always effectively addressed; and
- QA audits and oversight activities for the QC Program missed opportunities to identify the findings of their investigation (CR-HQN-2009-01169, CR-HQN-2009-0153, and CR-HQN-2010-00013). In particular, the Entergy corporate ANSI Level III inspector was required to perform periodic surveillances of QC inspection activities to ensure the program is being adequately implemented and maintained, but these required surveillances were not performed in 2008 (CR-HQN-2009-00111). This is further discussed in Section 4OA7.

Subsequent to the identification of these deficiencies, Entergy personnel initiated corrective actions to ensure that appropriate safety-related, engineering changes and non-routine maintenance work orders were identified and routed to the Maintenance Inspection Coordinator for evaluation and inclusion of QC verification inspections in accordance with the revised requirements of procedure EN-WM-105, "Planning." These corrective actions and actions to preclude recurrence were collectively documented in the following Level A CRs: CR-HQN 2009-01184, dated December 21, 2009 and CR-HQN-2010-0013, dated January 6, 2010.

In-office NRC reviews identified the need to conduct further inspection activities. On June 14 through 17, 2010, the inspectors conducted a focused review of work performed at each NRC-licensed Entergy site to assess whether examples of missed QC verification inspections identified by Entergy during their review had the potential to have impacted the operability of important plant equipment. The inspectors also reviewed the corrective action database and maintenance records to independently assess the rigor of the Entergy review and to identify additional examples of missed QC verification inspections. The inspectors identified no additional examples, and concluded that the Entergy reviews were sufficient to identify the scope of the problems and develop actions to address the causes.

The inspectors' reviewed specific work items whose scope met QAPM requirements to have had QC verification inspections but did not have the appropriate inspections. Based in part on interviews with Entergy personnel, the inspectors determined that procedural guidance for work planning was not sufficiently detailed or clear to ensure that work packages with construction-like activities would be reviewed by the specified QC personnel. These individuals were responsible for designating the QC inspections that were required by the QAPM.

The inspectors also identified numerous CRs written at Entergy sites that documented improper implementation of QC verification inspections. Specific CRs are listed in the attachment.

Analysis. The performance deficiency associated with this finding was that Entergy personnel did not ensure that quality control verification inspections were consistently included and correctly specified in quality-affecting procedures and work instructions for

construction-like work activities as required by the QAP. This finding is more than minor because it's a programmatic deficiency that if left uncorrected, could lead to a more significant safety concern in that the failure to check quality attributes could involve an actual impact to plant equipment. This finding affected the design control attribute of the Mitigating Systems cornerstone because missed quality control inspections during plant modifications could impact the availability, reliability, and capability of systems needed to respond to initiating events.

Using IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because the finding is a qualification deficiency confirmed not to result in a loss of operability or functionality. Specifically, inspectors verified by sampling that work documents provided objective quality evidence that work activities that had missed quality control verifications were properly performed.

The finding has a cross-cutting aspect in the area of human performance associated with the decision-making attribute because the licensee did not have an effective systematic process for obtaining interdisciplinary reviews of proposed work instructions to determine whether quality control verification inspections were appropriate. [H.1(a) per IMC 0310] (Section 4OA2.1.1)

Enforcement. 10 CFR Part 50, Appendix B, Criterion X, "Inspection," requires, in part, that examinations, measurements, or tests of material... shall be performed for each work operation where necessary to assure quality If mandatory inspection hold points, which require witnessing or inspecting by the licensee's designated representative and beyond which work shall not proceed without the consent of the designated representative are required, the specific hold points shall be indicated in appropriate documents.

Entergy's QAPM, Revision 20, Section B.12., "Inspection" requires, in part, that: "Provisions to ensure inspection planning is properly accomplished are to be established. Planning activities are to identify the characteristics and activities to be inspected, the inspection techniques, the acceptance criteria, and the organization responsible for performing the inspection. Provisions to identify inspection hold points, beyond which work is not to proceed without consent of the inspection organization, are to be defined."

Contrary to the above, from February 2006 to December 2009, the licensee failed to ensure that examinations, measurements, or tests of material were performed for each work operation where necessary to assure quality, and failed to include mandatory inspection hold points in appropriate documents. Specifically, multiple examples of Maintenance Work Orders and Engineering Change documents for construction-related activities involving safety-related systems structures and components were identified where witnessing or inspections were required to be performed to ensure quality, but these steps were not identified, included in the work documents, or performed as required QC hold points in the work instructions. Condition reports documenting the specific problems and examples of the violation included:

CR-IP2-2009-05348	CR-IP2-2009-05400	CR-IP2-2009-05321
CR-IP3-2009-04883*	CR-IP2-2009-05389	CR-IP2-2009-05399
CR-HQN-2009-01083	CR-HQN-2009-01084	CR-HQN-2009-01085

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CR-HQN-2009-01093
 CR-HQN-2009-01169
 CR-HQN-2009-01188

CR-HQN-2009-01096
 CR-HQN-2009-01170

CR-HQN-2009-01140
 CR-HQN-2009-01184

*determined to be related to Unit 2

Because this finding was of very low safety significance and was entered into Entergy's CAP as CR-HQN 2009-01184 and CR-HQN-2010-0013, consistent with Section 2.3.2 of the Enforcement Policy, this violation is being treated as a NCV: **NCV 05000247/2010005-04, Failure to Perform Required Quality Control Inspections.**

(2) Failure to Implement the Experience and Qualification Requirements Associated With the Quality Assurance Program

Introduction. The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion II, "Quality Assurance Program," because Entergy personnel did not implement the qualification and experience requirements of the QAP to ensure that an individual assigned to the position of quality assurance manager (QAM) met the qualification and experience requirements of ANSI/ANS 3.1-1978. Specifically, the individual assigned as the responsible person for the Entergy's overall implementation of the QAP did not have at least 1 year of nuclear plant experience in the overall implementation of the QAP within the quality assurance organization prior to assuming those responsibilities.

Description. During their review of the issues surrounding the improper implementation of quality control (QC) verifications discussed above, the inspectors noted that the root cause analysis documented in CR-HQN-2010-0013 identified that lack of experience of the Quality Assurance (QA) Manager contributed to the failure to identify the trend in missed QC verification inspections. The inspectors reviewed the relevant experience and qualifications of the QA Manager at each Entergy site. The inspectors also reviewed the NRC's safety evaluation report that approved Entergy's original corporate Quality Assurance Program Manual (QAPM), which is the document that contains the QA Program. Additionally, the inspectors reviewed the administrative section of the Technical Specifications for all the Entergy sites and a sample of evaluations, performed in accordance with 10 CFR 50.54(a), that supported Entergy QAPM changes and alignment of plants that were subsequently purchased by Entergy.

The Entergy corporate QAPM required each site to meet the experience and qualification standards in ANSI/ANS 3.1-1978, "American National Standard for Selection and Training of Nuclear Power Plant Personnel." Section 4.4 included qualification and experience requirements for the personnel described as "group leaders" of five professional-technical groups, including Quality Assurance. Section 4.4.5, "Quality Assurance," required that "...the responsible person shall have six years experience in the field of quality assurance, preferably at an operating nuclear plant, or operations supervisory experience. At least one year of this six years experience shall be nuclear power plant experience in the overall implementation of the quality assurance program. (This experience shall be obtained within the quality assurance organization.)"

On December 15, 2008, procedure EN-QV-117, "Oversight Training Program," the Entergy procedure used by all Entergy sites to implement the requirements of ANSI/ANS 3.1-1978, was revised by the Entergy corporate QA group. Section 5.7, "Manager/QA Senior Auditor Training," was changed to state:

Either the QA Manager or the Senior QA Auditor will meet the requirements of ANS 3.1-1978 paragraph 4.4.5 for operating plants and if applicable ANS 3.1-1993 paragraph 4.3.7 for new plants.

The inspectors reviewed completed Personnel Change Planning Checklist/Forms for QA Managers at each site. Entergy used this form to evaluate QA manager candidates prior to the implementation of an Entergy fleet-wide restructuring in July 2007. Attachment 8, "Change Management Guidelines for Alignment Implementation," included the following conclusion for the individual that subsequently was assigned to be the QA Manager:

[Individual's name redacted] meets the minimum requirements for QA Manager with the exception of at least one year of this six years experience shall be nuclear power plant experience in the overall implementation of the quality assurance program. This requirement must be met by the QA Senior Auditor.

Based on discussions with Entergy corporate QA personnel, the inspectors determined that Entergy personnel had interpreted ANSI/ANS 3.1-1978, Sections 4.4 and 4.4.5 to allow the Senior Auditor to be considered the QA group leader described in the standard for purposes of meeting the experience requirements of Section 4.4.5 in cases where a candidate for the position of QA Manager did not satisfy the experience requirements.

In reviewing this issue, the NRC staff has determined that the group leader in this case is the individual filling the position assigned responsibility for overall implementation of the QA Program (Entergy used the title "QA Manager" for this position). The individual meeting the experience and qualification requirements must be the individual assigned the responsibilities for overall implementation of the QA Program assigned within the QA Program.

The inspectors determined that this change to procedure EN-QV-117 did not ensure that the qualifications for the QA Manager would meet the requirements of standard. The inspectors identified an example where the Senior Auditor was credited as being the group leader for purposes of meeting ANSI/ANS 3.1-1978, and the individual who was assigned as the QA Manager did not meet the ANSI/ANS 3.1-1978 experience requirements. The team also determined that the responsibilities assigned to the QA Manager under the QAPM were not reassigned to the Senior Auditor, and the Senior Auditor did not report directly to the designated senior executive. The Senior Auditor continued to report to the QA Manager, so the person with the greater experience did not have the positional authority to decide issues.

Analysis. The performance deficiency associated with this finding was that Entergy did not implement the qualification and experience requirements of the QAP to ensure that an individual assigned to the position of QAM met the qualification and experience requirements of ANSI/ANS 3.1-1978. This finding is more than minor because if left uncorrected, it could lead a more significant safety concern. Specifically, the failure to have a fully qualified individual providing overall oversight to the QAP had the potential to affect all cornerstones. However, this finding will be tracked under the Mitigating Systems cornerstone as the area most likely to be impacted.

The finding was not suitable for quantitative assessment using existing Significance Determination Process guidance. Using IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," NRC management determined the

finding to be of very low safety significance (Green) because other quality assurance program functions remained unaffected by this performance deficiency, so defense-in-depth continued to exist.

The inspectors determined that there was no cross-cutting aspect associated with this finding because the performance deficiency did not reflect Entergy's current performance. Specifically, the performance deficiency occurred more than three years ago and was outside the current assessment period.

Enforcement. 10 CFR 50, Appendix B, Criterion II, "Quality Assurance Program," requires, in part, that the licensee establish a quality assurance program which complies with Appendix B. This program shall be documented by written policies, procedures, or instructions and shall be carried out throughout plant life in accordance with those policies, procedures, or instructions. The program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained.

The Entergy Quality Assurance Program Manual, Revision 13, is the document used at each Entergy-owned site to describe the quality assurance program. Table 1, Section A of the Quality Assurance Program Manual states, in part, that qualifications and experience for station personnel shall meet ANSI/ANS 3.1-1978 except for positions where an exception to either ANSI/ANS 3.1-1978 or N18.1-1971 is stated in the applicable unit's Technical Specifications.

ANSI/ANS 3.1-1978, Section 4.4.5, "Quality Assurance," states, in part, that the responsible person (i.e. the Quality Assurance Manager) shall have six years experience in the field of quality assurance. At least one year of this six years experience shall be obtained within the quality assurance organization.

Contrary to the above, between July 7, 2007 and July 8, 2008, the licensee failed to implement the quality assurance program requirements intended to provide indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency was achieved and maintained. Specifically, the individual assigned to be the responsible person for the licensee's overall implementation of the Quality Assurance Program did not have at least 1 year of nuclear plant experience in the overall implementation of the Quality Assurance Program within the quality assurance organization prior to assuming those responsibilities. Because this finding was of very low safety significance and was entered into Entergy's CAP as CR-HQN-2010-00386, consistent with Section 2.3.2 of the Enforcement Policy, this violation is being treated as a NCV: **NCV 05000247/2010005-05, Failure to Implement the Experience and Qualification Requirements of the Quality Assurance Program.**

4OA3 Event Follow-Up (71153 – 3 samples).1 (Closed) Licensee Event Report 05000247/2010-007-00, Automatic Reactor Trip Due to a Turbine Trip as a Result of a High Steam Generator Level Trip After Transition to Single Feedwater Pump Operationa. Inspection Scope

On September 3, 2010, during a scheduled plant shutdown, an automatic reactor trip occurred at approximately 41% power as a result of a turbine trip due to a high steam generator (SG) water level. The inspectors evaluated the response of control room personnel and plant equipment following the automatic reactor trip as described in NRC Inspection Report 05000247/2010004. Entergy personnel determined that the root cause of the event was inadequate design control of the proportional band and reset tuning settings for critical plant controllers; and that there was less than optimum settings on the MBFP speed controller, feed regulatory valve flow controllers, and the SG level controllers for low power operations. The immediate corrective actions included changing the MBFP speed controller settings to the optimum settings. Entergy personnel documented the root cause evaluation in CR IP2-2010-05484. This LER is closed.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one event follow-up sample as defined in NRC Inspection Procedure 71153.

b. Findings

Introduction. A Green self-revealing finding was identified because Entergy's procedure 2-IC-PC-N-P-408A, "Main Boiler Feed Pump Discharge Pressure Speed Control," did not provide adequate guidance to ensure proper settings for the MBFP speed controller settings at low power operations, contributing to a reactor trip from 41% power during a planned shutdown on September 3, 2010.

Description. On September 3, 2010, during a planned shutdown to repair the 21 reactor coolant pump, an automatic reactor trip occurred as a result of a turbine trip due to a high steam generator (SG) water level. Prior to the event, operations personnel had reduced reactor power from 100% to 41% with both MBFPs in operation. Operators removed the 21 MBFP from service as planned, and the 22 MBFP increased in speed to make up for the 21 MBFP being removed from service. However, 22 MBFP was slow to increase in speed, resulting in a decrease in water level to all four SGs. The 22 MBFP continued to increase in speed and flow even when SG level began to recover, causing an increase in SG water level. Due to the increasing SG water level, operators took manual control of the 24 feed regulation valve (FRV) to reduce feedwater flow. The 22 and 23 FRVs automatically responded by reducing flow to the 22 and 23 SGs. Operations personnel also took manual control of the 21 FRV to reduce flow to the 21 SG. The decrease in flow to the 21 and 24 SGs resulted in an increase in feedwater flow to the 22 and 23 SGs, until the high level trip setpoint was reached in the 23 SG, and a turbine trip and reactor trip was automatically initiated per the plant design.

Entergy personnel performed a root cause evaluation (CR-IP2-2010-5484), and determined the root cause was inadequate design control of the proportional band and

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reset tuning settings for critical plant controllers. Entergy personnel determine there were less than optimum controller settings on the MBFP speed controller, feed regulatory valve flow controllers, and steam generator level controllers for low power operations. Entergy personnel took immediate corrective actions to change the MBFP speed controller settings. Entergy's corrective actions included reviewing I&C procedures to ensure that the instrument calibration requirements matched I&C preventative maintenance documents, and a list of critical controllers was generated and the Equipment Data Base (EDB) updated with known controller settings. Entergy's planned corrective actions include reviewing I&C procedures to identify changes to ensure controller calibrations maintain required settings, reviewing procedures to incorporate testing of critical parameters, and issuing an engineering evaluation and updating the EDB in the work control program with findings on controller settings.

The inspectors reviewed a design change on May 5, 2006, where Entergy staff processed a change to remove the settings for the MBFP speed controllers from I&C Procedure 2-IC-PC-N-P-408A, "Main Boiler Feed Pump Discharge Pressure Speed Control." As a result, the MBFP speed controller settings were not maintained at the proper settings. The inspectors determined the change was processed through DRN-06-02146 inappropriately as an editorial change and not a technical change and thus did not receive a cross-disciplinary review and user validation required by procedure IP-SMM-AD-102, "IPEC Implementing Procedure Preparation, Review, and Approval." The speed controller settings caused a slower response of the 22 MBFP after the 21 MBFP was removed from service. The inspectors determined that without prescribed MBFP speed controller settings, that I&C procedure 2-IC-PC-N-P-408A, "Main Boiler Feed Pump Discharge Pressure Speed Control," was not adequate to ensure proper operation of the MBFPs.

Analysis. The performance deficiency associated with this finding was that Entergy's procedure 2-IC-PC-N-P-408A did not provide adequate guidance to ensure proper settings for the MBFP speed controller settings at low power operations. This finding is more than minor because it is associated with the design control attribute of the Initiating Events cornerstone and affects the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Specifically, inadequate design control of the MBFP speed controller settings contributed to a reactor trip.

Using IMC 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance (Green) because the finding did not contribute to the likelihood that mitigation equipment or functions would not be available.

The inspectors determined there was no cross-cutting issue associated with the finding because the performance deficiency did not reflect current licensee performance. Specifically, the performance deficiency occurred several years ago and was outside the current assessment period.

Enforcement. This finding does not involve enforcement action because no regulatory requirement violation was identified. Because this finding does not involve a violation, has very low safety significance, and it was entered into Entergy's CAP as CR IP2-2010-05484, it is identified as a finding: **FIN 5000247/2010005-06, Inadequate Main Boiler Feed Pump Speed Controller Setting.**

.2 Automatic Reactor Trip on Turbine Trip Due to 21 Main Transformer Failure

a. Inspection Scope

The inspectors reviewed the below listed event for plant status and mitigating actions to evaluate Entergy performance and confirm that Entergy operators implemented actions and notifications (if required) in accordance with station procedures. The inspectors also reviewed Entergy's emergency response actions to evaluate Entergy staff performance and confirm that Entergy staff implemented actions and notifications in accordance with station procedures for the Alert declaration.

At 1839 hours on November 7, 2010, Unit 2 experienced a reactor trip. At 1841, the Unit 2 control room operators were informed that there had been an explosion in the Unit 2 transformer yard/diesel generator building area. The station fire brigade was activated to respond to the notification of explosion. Soon thereafter, a second explosion occurred, and this one was felt and heard in the Unit 2 control room. At 1849, the Unit 2 Shift Manager declared an Alert emergency based on reports of two explosions in the transformer yard (Entergy subsequently determined that both explosions were the result of the 21 main transformer failure). The Alert declaration was made in accordance with emergency action level (EAL) 8.2.3, which states "fire or explosion in any plant area, Table 8.1, which causes or potentially causes any required safety related system or structure to become inoperable." The diesel generator building/fuel tank area is listed in Table 8.1. The operation's crew activated the IPEC emergency response organization (ERO) to respond to the event. Entergy staff terminated the emergency at 2218 hours.

The inspectors evaluated the response of control room personnel following the automatic reactor trip that occurred as a result of the failure of 21 main transformer. The inspectors reviewed plant computer data, including the sequence of events report, evaluated plant parameter traces, and discussed the event with plant personnel, to verify that plant equipment responded as expected, and to ensure that operating procedures were appropriately implemented. The inspectors also verified that Entergy's post trip review group (PTRG) identified the most probable cause(s) of the trip to facilitate corrective actions prior to restart. This event and the PTRG report were entered into Entergy's CAP as CR-IP2-2010-06801.

The inspectors also reviewed Entergy actions and decision making to verify decisions were consistent with a conservative approach to assessing the condition and in accordance with the site emergency plan. The inspectors reviewed logs and records from the night of the event, interviewed operational and emergency planning staff, and reviewed Alert Report and other corrective action documentation.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one event follow-up sample as defined in Inspection Procedure 71153.

b. Findings

No findings were identified associated with the operational response to the reactor trip.

There were two findings identified regarding Entergy staff's implementation of the emergency plan. The inspectors will conduct further review of the root cause evaluation (RCE) and associated corrective actions in conjunction with review of the licensee event report to be submitted by Entergy personnel.

(1) Failure to Staff the TSC and OSC within the Required Time Limit

Introduction. A Green self-revealing NCV of 10 CFR 50.54, "Conditions of Licenses," paragraph (q) was identified because Entergy staff did not adequately implement the requirements of the IPEC Emergency Plan.

Description. On the evening of November 7, 2010, the Unit 2 operating crew declared an Alert emergency at 1849 hours. At 1852 hours, the crew activated the Dialogic System, which notifies the site ERO of the event and requires the augmentation of the on-shift ERO by the on-call responders. The IPEC Emergency Plan, Section H, Emergency Facilities and Equipment, requires that the TSC and OSC be operational within 60 minutes after a declaration of an Alert, Site Area Emergency, or General Emergency. The TSC was staffed and declared operational at 2008 hours, and the OSC was staffed and declared operational at 2015 hours. Both of these activation times exceeded the 60 minute staffing requirement in the IPEC Emergency Plan.

Entergy determined that two factors contributed to the failure to staff the emergency response facilities in the required time. First, there were notified ERO members who questioned the validity of the beeper indications or believed that other ERO members would respond, and therefore did not respond to their assigned emergency response facility. Entergy determined this behavior was not in accordance with the IPEC ERO augmentation design and training nor consistent with station expectations. Second, during the event, problems occurred with the beeper and phone systems used for ERO call-in. Some of the ERO responders indicated that the system recording stated there was no emergency, while other personnel received a beep but were unable to call in. The failure to comply with the requirements of the IPEC Emergency Plan resulted in Entergy's failure to comply with NRC regulations for timely augmentation of emergency response capabilities.

Entergy personnel documented the station's performance during the Alert emergency in an event report, and initiated several condition reports to address deficiencies in equipment and personnel performance. CR-IP2-2010-06870 was written to investigate and correct the condition that the TSC and OSC did not meet minimum required staffing within the required 60 minutes. CR-IP2-2010-6813 and CR-IP2-2010-6831 were initiated to address the reported technical problems with the beeper and phone system, while CR-IP2-2010-6871 was written to address why certain individuals on the on-call ERO team did not report to the site or were late.

The inspectors reviewed the event report and the CRs to assess the adequacy of Entergy's self-assessment and of the planned corrective actions. The inspectors determined that Entergy had identified the causes of the November 7 staffing issues and concluded that actions taken and planned corrective actions were adequate.

Analysis. The performance deficiency associated with this finding was that Entergy personnel did not meet the requirements of the IPEC Emergency Plan in that the TSC and OSC were not staffed nor declared operational within 60 minutes of the Alert

emergency declaration on November 7, 2010. This finding is more than minor because it affected the Emergency Response Organization attribute of the EP Cornerstone to ensure that the licensee is capable of implementing adequate measures to protect the public health and safety in the event of a radiological emergency.

In accordance with IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the inspectors determined the finding to be of very low safety significance (Green). Specifically, the inspectors utilized IMC 0609, Appendix B, Section 4.2 and Sheet 2, "Actual Event Implementation Problem," and determined that the failure to comply with an aspect of the Emergency Plan related to ERO augmentation (10 CFR 50.47(b)(2)) was a non-risk-significant planning standard problem which occurred during an Alert emergency and is therefore a Green finding.

This finding has a cross-cutting aspect in the area of human performance associated with the work practices attribute of defining and effectively communicating expectations regarding procedural compliance and personnel following procedures. Specifically, Entergy staff did not comply with ERO expectations and procedures regarding prompt reporting to an assigned emergency response facility during an actual event. [H.4(b) per IMC 0310]

Enforcement. 10 CFR 50.54(q) requires, in part, that a licensee "shall follow and maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E of this part." 10 CFR 50.47(b)(2) requires, in part, that "timely augmentation of response capabilities is available."

Contrary to the above, on November 7, 2010, the IPEC ERO did not respond and staff the site TSC and OSC in a timely manner. The IPEC Emergency Plan requires that these facilities be staffed and operational within 60 minutes of an Alert emergency declaration. On November 7, the TSC was declared operational 79 minutes after the Alert declaration, and the OSC 86 minutes after the declaration. By failing to meet the requirements of the IPEC Emergency Plan, and therefore 10 CFR 50.47(b)(2), Entergy was in violation of 10 CFR 50.54(q) for not properly maintaining the conditions of the IPEC Emergency Plan. Entergy initiated training and counseling corrective actions to address the personnel performance issues and equipment issues. Because this finding is of very low safety significance and was entered into Entergy's CAP as CR- IP2-2010-6813, -6831, and -6870, consistent with Section 2.3.2 of the NRC Enforcement Policy, this violation is being treated as a NCV: **NCV 005000247/2010005-07, Failure to Staff the Site TSC and OSC within 60 Minutes of an Alert Emergency Declaration.**

(2) Failure of Offsite Notification Procedure to Meet the Requirements of the Site Emergency Plan

Introduction. The inspectors identified a Green NCV of 10 CFR 50.54, "Conditions of Licenses," paragraph (q) because the Entergy EPIP for notification of offsite officials did not meet the requirements of the IPEC Emergency Plan.

Description. Following the declaration of the Alert emergency at 1849 hours on November 7, 2010, the central control room (CCR) crew entered EPIP IP-EP-210, "Central Control Room." Attachment 9.1, Shift Manager/POM (Emergency Director) Checklist, of the EPIP directs the Shift Manager to complete a NYS Radiological Emergency Data Form, Part 1 (Form EP-1), and then have the CCR Offsite

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Communicator email and fax the form to offsite authorities. Using the radiological emergency communication system (RECS) and Form EP-4, the Offsite Communicator confirms receipt of the Part 1 Form by offsite authorities. A note in Attachment 9.1 requires that notification of state and local authorities shall be initiated within 15 minutes of an Alert declaration. The IPEC Emergency Plan, Section E, Notification Methods and Procedures, paragraph 1.b.5, requires in part that an immediate notification (within 15 minutes) of an Alert is made by the Shift Manager or his designee to the New York State and Westchester, Rockland, Putnam, and Orange Counties. NRC regulations, specifically 10 CFR 50.47(b)(5), require in part that "procedures have been established for notification, by the licensee, of State and local response organizations."

On the evening of November 7, when the Offsite Communicator attempted, via a telephone conference line, to confirm receipt of the Part 1 Form, the communicator learned that a problem had occurred with the fax machine and the only offsite authority to have received the fax was New York State. Per the direction of the guidance in Form EP-4, the Offsite Communicator instructed the four county personnel on the telephone conference to obtain the Form 1 from the State. One of the county personnel requested the Offsite Communicator to read the Form 1 over the conference line. The Offsite Communicator complied with the request and read the Form 1 information to the four county personnel at approximately 1902 hours, within 15 minutes of 1849 hours.

On November 8, 2010, in response to Entergy's event notification to the NRC, the Region I senior emergency preparedness inspector discussed the November 7 event with the IPEC Emergency Planning Manager. The inspector questioned that Form EP-4 provided for the delegation of Entergy's responsibility for notification, an apparent contradiction of Emergency Plan requirements. Due to County staff intervention, the offsite notifications were adequately performed, but the NRC inspector identified that had the Offsite Communicator followed his procedural guidance, the notifications would not have been made in accordance with IPEC Emergency Plan requirements or with NRC regulations. The inspector determined that Form EP-4 had provided for the deficient backup method since it was revised in July 2006. Entergy initiated in CR-IP2-2010-07563 to investigate and resolve Form EP-4 deficiency concerning the backup method for offsite notification.

Entergy personnel determined the problem encountered with the fax machine on the evening of November 7, 2010, was due to a design flaw in the MIDAS software package used to construct the Form 1. The flaw involved a feature that would prevent sending the Form 1 file if the user attempts to send the file before a data compiling feature of the program has completed its function. Entergy personnel concluded that on November 7, the Offsite Communicator had attempted to send the form too soon after data had been entered. The problems encountered with MIDAS were replicated after the event, and Entergy initiated software design changes to the MIDAS program to correct the timing deficiency.

The NRC reviewed the IPEC Emergency Plan and its associated EIPs, reviewed records from the November 7, 2010, event, and discussed the issue with IPEC and County personnel. Further, the inspector reviewed the planned changes to Form EP-4 and the intended design changes to the MIDAS and fax software. The inspector concluded the planned corrective actions appeared adequate to correct the problems identified as a result of the November 7, 2010 event.

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Analysis. The performance deficiency associated with this finding was that Entergy procedures allowed for a back-up notification process that did not comply with the requirements of the site emergency plan: the emergency plan requires that the Shift Manager or his designee notify the offsite authorities of an emergency declaration, while Form EP-4 directed the delegation of this responsibility to an offsite authority itself. This finding is more than minor because it affected the Emergency Response Organization attribute of the EP cornerstone to ensure that the licensee is capable of implementing adequate measures to protect the public health and safety in the event of a radiological emergency.

In accordance with IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the inspectors determined the finding to be of very low safety significance (Green). Specifically, the inspectors utilized IMC 0609, Appendix B, Section 4.5 and Sheet 1, "Failure to Comply," and determined that the failure to comply with an aspect of the Emergency Plan related to event notification (10 CFR 50.47(b)(5)) was a risk-significant planning standard (RSPS) problem. It was not a RSPS functional failure of the IPEC event notification process, because the deficiency in the IPEC EPIP was in the backup method for offsite notification, and despite the procedural flaw offsite notifications were made in a timely and accurate manner on November 7, 2010.

The inspectors determined there was no cross-cutting issue associated with the finding because the performance deficiency did not reflect current licensee performance. Specifically, the performance deficiency occurred greater than three years ago and was outside the current assessment period.

Enforcement. 10 CFR 50.54, "Conditions of Licenses," paragraph (q) requires, in part, that a licensee "shall follow and maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E of this part." 10 CFR 50.47(b)(5) requires, in part, that "procedures have been established for notification, by the licensee, of State and local response organizations."

Contrary to the above, since July 2006 Entergy IPEC EIPs provided a backup notification method that delegated the licensee's responsibility for offsite notifications to an offsite authority. The IPEC Emergency Plan and 10 CFR 50.47(b)(5) require that the Entergy IPEC staff perform the notification of offsite authorities. Due to this procedure deficiency, Entergy was in violation of 10 CFR 50.54(q) for not properly maintaining the conditions of the IPEC Emergency Plan. Entergy initiated corrective actions to correct Form EP-4 by having the Offsite Communicator read the Part 1 Form to the offsite authorities if the fax/email method does not work. Because this finding is of very low safety significance and was entered into Entergy's CAP as CR-IP2-2010-07563, consistent with Section 2.3.2 of the NRC Enforcement Policy, this violation is being treated as a NCV: **NCV 005000247 and 005000286/2010005-08, Failure of Offsite Notification Procedure to Meet the Requirements of the Site Emergency Plan.**

3. Loaded Multi-Purpose Canister Stuck During Transfer from the HI-TRAC Transfer Cask to a HI-STORM Storage Cask

a. Inspection Scope

The inspectors reviewed the below listed equipment problem for plant status and mitigating actions to evaluate Entergy personnel performance and confirm that the

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Entergy staff implemented actions and notifications in accordance with station procedures.

From July through November 2010, Entergy personnel conducted a campaign to place selected spent fuel elements into dry cask storage. On November 18, 2010, during the stack up and transfer of a fully loaded Multipurpose Canister (MPC) MPC-32 canister from the HI-TRAC transfer cask into a HI-STORM storage cask, the MPC became lodged while partially inserted into the mating device. The MPC had been lowered approximately 8 inches into the mating device from the HI-TRAC, but became lodged and could not be lowered or raised with the fuel storage building (FSB) gantry crane.

Through consultation with representatives of Holtec International (Holtec), the storage system vendor; and Ederer, the Unit 2 FSB gantry crane manufacturer; Entergy personnel determined the problem to be a result of a misalignment of the HI-TRAC and the mating device that joins the HI-TRAC to the HI-STORM for the MPC transfer. After not being able to dislodge the MPC during the stack up and transfer on November 18, 2010, Entergy personnel, in consultation with Ederer personnel on site, bypassed the crane load cell so that the 90,000 pound limit could be exceeded. The FSB gantry crane auxiliary hoist was slowly and incrementally raised. At approximately 100,000 pounds the MPC was successfully dislodged, the load cell dropped down to approximately 87,000 pounds, and the MPC was able to be raised back into the HI-TRAC. The HI-TRAC and MPC were then lifted off the HI-STORM and mating device and placed into a safe storage position on November 19, 2010. Entergy personnel subsequently resumed dry cask operation stack up and transfer on December 13, 2010 and the MPC was able to be loaded into the HI-STORM that day. The HI-STORM was subsequently placed on the independent spent fuel storage installation (ISFSI) pad on December 16, 2010, and no additional problems were encountered.

The inspectors reviewed Entergy actions and decision making to verify decisions were consistent with a conservative approach to assessing and addressing the condition. The inspectors reviewed whether Entergy evaluations (and/or vendor supplied correspondence) were supported and addressed the structural performance of the MPC. The inspectors also reviewed station evaluations that concluded there was no structural damage to the mating device. The inspectors determined that Entergy and vendor-supplied evaluations appropriately concluded that the MPC was not adversely impacted in either thermal or structural performance. Entergy entered the issue into the CAP and plans to revise Holtec procedure 2-DCS-009-GEN, "MPC Transfer & HI-STORM Movement," to ensure that the HI-TRAC is properly aligned with the mating device before the next cask is loaded.

Specific documents reviewed during this inspection are listed in the attachment. These activities constitute completion of one event follow-up sample as defined in NRC Inspection Procedure 71153.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Confirmatory Order, EA-09-060, November 10, 2009, Failure to Provide Complete and Accurate Information

a. Inspection Scope

On May 22, 2008, the NRC completed a security baseline inspection at the Palisades Nuclear Plant. The inspection covered one or more of the key attributes of the security cornerstone of the NRC's Reactor Oversight Process. As a result of the inspection observations, the NRC Office of Investigations (OI) initiated an investigation (OI Case No. 3-2008-020). Based on the evidence developed during the inspection and investigation, the NRC identified a violation of 10 CFR 50.9 for inaccurate and incomplete information. Specifically, the licensee failed to ensure that information in corrective action documents was complete and accurate in all material respects and failed to provide accurate information to the Commission during a telephone conversation between a licensee employee and an NRC inspector.

The results of the investigation were sent to Entergy in a letter dated July 14, 2009. This letter offered Entergy the opportunity to either participate in Alternate Dispute Resolution (ADR) mediation or to attend a Predecisional Enforcement Conference. On July 28, 2009, the NRC and Entergy agreed to participate in ADR mediation.

On September 15, 2009, the NRC and Entergy participated in an ADR session and, as a result, a Confirmatory Order was issued pursuant to the agreement reached during the ADR process. As part of the ADR settlement agreement, Entergy agreed to a number of organizational, procedural, and management oversight related corrective actions and enhancements at Palisades Nuclear Plant and other Entergy Fleet nuclear sites.

During this inspection at Indian Point Energy Center, from November 15 - 19, 2010, the inspectors evaluated the overall effectiveness of the licensee's response to Action Item 2 of the Confirmatory Order. Specifically, Entergy developed and implemented a formal process, within the current CAP, that ensured that Safeguards and Security-Related information, which would otherwise not be contained in the CAP, is processed in an auditable manner, consistent with Entergy's existing CAP.

The evaluation was conducted through: 1) interviews with non-supervisory personnel at Indian Point Energy Center; 2) interviews with program managers and supervisors responsible for implementing the CAP at the site; and 3) an evaluation of licensee documents and procedures related to compliance with Action Item 2 of the Confirmatory Order.

The inspectors conducted the following specific inspection activities to:

- Verify CRs that require documentation of Safeguards Information (SGI) were clearly identified as Safeguards CRs;
- Verify where SGI is required to describe the condition or corrective actions, the additional information is contained in a uniquely identified and referenced safeguards document;

- Verify that CRs that require documentation of SGI reference the uniquely identified safeguards document and the uniquely identified safeguards document references the CR;
- Verify the site security manager identified situations where SGI may need to be discussed for the Condition Review Group (CRG) and Corrective Action Review Board (CARB) to properly prioritize CRs or review CR evaluations, and that members of the CRG and CARB were qualified to review SGI;
- Verify that review of the adequacy of the response to a corrective action was performed by safeguards qualified personnel when SGI was required to describe information in the Corrective Action (CA); and
- Verify that closure reviews for safeguards CRs were performed by safeguards qualified personnel.

b. Findings

No findings were identified.

.2 Independent Spent Fuel Storage Installation Monitoring Controls (60855)

a. Inspection Scope

The inspector reviewed routine operations and monitoring of the ISFSI. The inspector walked down the ISFSI, observed the condition of the storage modules including the air cooling ventilation openings, performed independent dose rate measurements of the storage modules, and reviewed logs that confirmed daily walkdowns were performed to observe ventilation openings for the months of August through November 2010 as specified in NRC Certificate of Compliance no. 1014 requirements.

b. Findings

No findings were identified.

.3 Review of the Shift Staffing Requirements

a. Inspection Scope

Inspectors reviewed the circumstances surrounding the February 9, 2010 occurrence where the Control Room Supervisor (CRS), assigned as having the control room command function, left the control room without designating another senior reactor operator qualified individual to assume the control room command function.

b. Findings

Command Function SRO Leaves the Control Room

Introduction. A Green self-revealing NCV of TS 5.1, "Responsibility," was identified because on February 9, 2010, the CRS assigned as having the control room command function, left the control room without designating another SRO-qualified individual to assume the control room command function.

Description. On February 9, 2010, the CRS, one of two SRO-qualified individuals in the watch section, left the control room to lead the morning meeting. The Shift Supervisor (SS) was already out of the control room and the CRS had the responsibility for the control room command function at that time. This left the reactor operators with no senior reactor operator in the control room to respond to events.

The Reactor Operator (RO) promptly recognized that there was no SRO in the control room and initiated actions to have the CRS return to the control. Upon hearing the RO paging him, the CRS realized his mistake and returned to the control room. The CRS was out of the control room for approximately 5 minutes. Technical Specification 5.1, "Responsibility," states that the SS shall be responsible for the control room command function and that during any absence of the SS from the control room while the unit is in MODE 1, 2, 3, or 4, an individual with an active Senior Reactor Operator (SRO) license shall be designated to assume the control room command function. Entergy entered this issue into the CAP as CR-IP2-2010-00708.

Analysis. The performance deficiency associated with this finding was that the CRS left the control room without designating an SRO-qualified individual to assume the control room command function, contrary to the requirements of TS 5.1. His actions were also contrary to requirements of Entergy Nuclear Management Manual Procedure EN-OP-115, "Conduct of Operations." This finding is more than minor because it could reasonably be viewed as a precursor to a significant event. Specifically, the absence of SRO oversight during licensed control room activities increases the likelihood of human performance errors contributing to an initiating event and reduces the effectiveness of event mitigation. The finding is associated with the human performance attribute of the Mitigating Systems cornerstone and affects the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences.

The finding was not suitable for quantitative assessment using existing Significance Determination Process guidance. Using IMC 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," NRC management determined the finding to be of very low safety significance (Green) because of the short period the CRS was absent from the control room, and because no initiating events occurred during that time.

The finding has a cross-cutting aspect in the area of human performance associated with the work practices attribute because of the ineffective use of shift turnover practices, in that the CRS did not self check or communicate his decision to leave the control room to the rest of the control room staff. [H.4(a) per IMC 0310]

Enforcement. Technical Specification 5.1, "Responsibility," states that the SS shall be responsible for the control room command function and that during any absence of the SS from the control room while the unit is in MODE 1, 2, 3, or 4, an individual with an active Senior Reactor Operator (SRO) license shall be designated to assume the control room command function.

Contrary to the above, on February 9, 2010, while the unit was in MODE 1, the Unit 2 CRS left the control room for a period of approximately five minutes without designating an individual with an active SRO license to assume the control room command function. Because this TS noncompliance is of very low safety significance (Green) and was

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entered into the CAP as CR-IP2-2010-00708, consistent with Section 2.3.2 of the NRC Enforcement Policy, this violation is being treated as an NCV: **NCV 05000247/2010005-09, Failure to Meet TS Oversight Requirement.**

40A6 Meetings, Including Exit

On December 2, 2010, the inspector presented inspection results of the radiation safety baseline inspection to Mr. Donald Mayer and other members of Entergy staff. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On December 9, 2010, the inspector presented the inspection results of the licensed operator requalification to members of licensee management. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 10, 2011, the inspector presented the results of the Selected Issue Follow-up Inspection of quality assurance and quality control issues to Mr. F. Inzirillo, Manager, Quality Assurance, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 19, 2011, the inspectors presented the inspection results of the integrated inspection to Mr. Joseph Pollock, Site Vice President, and other members of the Entergy staff. The licensee acknowledged the findings and observations presented. The inspectors asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

40A7 Licensee-Identified Violations

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

- 10 CFR 50.47(b)(4), requires that a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the licensee. 10 CFR 50.54(q), states in part, that licensees shall follow and maintain in effect emergency plans which meet the standards in 50.47(b). Contrary to the above, on October 20, 2010, during an extent of condition review of industry operating experience, Entergy personnel identified that the R-54 radiation monitor's (monitor is for liquid effluent from the waste distillate storage tanks) highest range of $4.7e-2$ uCi/cc was below the value of $2.5e-1$ uCi/cc required to declare an Alert using emergency action level (EAL) Table 5.1.

Entergy personnel documented this issue in the CAP as CR-IP2-2010-06417 and provided timely guidance to the control room operators to ensure proper classification of an event. In addition, Entergy personnel performed an apparent cause evaluation which included an extent of condition of the issue. The EAL

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chart and associated emergency plan procedures were revised to reflect the EAL changes. The inspectors determined that this finding is of very low safety significance because it did not result in a significant degradation of the risk significant planning standard function.

- 10 CFR 50, Appendix B, Criterion II, "Quality Assurance Program," requires, in part, that the licensee establish a quality assurance program which complies with Appendix B. This program shall be documented by written policies, procedures, or instructions and shall be carried out throughout plant life in accordance with those policies, procedures, or instructions. Procedure EN-QV-111, "Training and Certification of Inspection/Verification and Examination Personnel," Section 4.0 [4](i), requires that the Entergy corporate ANSI Level III inspector shall perform periodic (annual) surveillances of quality control inspection activities to ensure that the program is being adequately implemented and maintained. Contrary to the above, no surveillances of quality control inspection activities were performed for any Entergy site during calendar year 2008.

The issue was not suitable for quantitative significance determination, so it was assessed using IMC 0609, Appendix M, and evaluated using the qualitative criteria listed in Table 4.1. This finding was determined to be of very low safety significance because other quality assurance program functions remained unaffected by this performance deficiency, so defense-in-depth continued to exist. This issue was entered into the Entergy's CAP as CR-HQN-2009-00111.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION**KEY POINTS OF CONTACT****Entergy Personnel**

J. Pollock	Site Vice President
J. Abisamra	Echelon Chief Engineer
R. Allen	NDE Level III, Code Programs
H. Anderson	Specialist – Nuclear Safety/License IV
N. Azevedo	Supervisor – Engineering
J. Baker	Shift Manager
S. Beagles	Echelon Manager – Fleet Operations
M. Burney	Specialist – Nuclear Safety/License IV
R. Burroni	Manager – System Engineering
C. Childress	Manager – Dry Cask Project
T. Cole	Project Manager – NUC
G. Dahl	Specialist – Nuclear Safety/License IV
R. Daley	Engineer III – Nuclear
K. Davison	Assistant Plant Manager
G. Dean	Shift Manager
J. Dent	Echelon General Manager – Plant Operations, Fleet Operations Support
D. Dewey	Shift Manager
J. Dinelli	Manager - Operations
B. Ford	Echelon Senior Manager – Nuclear Safety and Licensing
T. Flynn	Maintenance Inspection Coordinator
D. Gagnon	Manager – Security
E. Harris	Echelon Manager – Quality Assurance
G. Hocking	Supervisor – Radiation Protection
F. Inzirillo	Manager – IPEC Quality Assurance
D. Jacobs	Echelon Senior Vice President – Planning, Development and Oversight
R. Lee	Lead Engineer – Buried Pipe and Tank Program
J. Lijoi	Superintendent – I&C
L. Lubrano	Senior Lead Engineer
R. Mages	Specialist – Senior HP/Chemical
T. McCaffrey	Manager – Design Engineering
J. McCann	White Plains Vice President – Nuclear Safety, Emergency Preparedness, and Licensing
P. Morris	Echelon Senior Staff Engineer
T. Orlando	Director – Engineering
T. Palmisano	Echelon Vice President – Oversight
E. Primrose	Shift Manager
S. Prussman	Specialist – Nuclear Safety/License IV
J. Reynolds	Specialist – Corrective Action
R. Robenstein	Superintendent – Simulator
T. Salentino	Superintendent – Dry Fuel Storage
S. Sandike	Specialist – Senior HP/Chemical
P. Santini	Senior Reactor Operator
A. Singer	Superintendent – Licensed Operator Requal Training
D. Smith	Technical Specialist IV
T. Tankersly	Echelon Director – Oversight

M. Tesoriero	Manager – Programs and Components
A. Vitale	General Manager – Plant Operations
R. Walpole	Manager – Licensing
E. Weinkam	White Plains Senior Manager – Nuclear Safety and Licensing
A. Williams	Manager – PS&O

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Open and Closed

05000247/2010-005-01	NCV	Inadequate Compensatory Measures for Out-of-Service Plant Vent Process Radiation Monitor (Section 1R19)
05000247/2010-005-02	FIN	Inadequate Work Planning Control Relative to Regenerative Heat Exchanger Permanent Shielding Modification That Resulted in Additional Unplanned Collective Exposure (Section 2RS2)
05000247/2010-005-03	FIN	Inadequate Work Coordination Relative to Reactor Cavity Liner Repair That Resulted in Additional Unplanned Collective Exposure (Section 2RS2)
05000247/2010-005-04	NCV	Failure to Perform Required Quality Control Inspections (Section 4OA2)
05000247/2010-005-05	NCV	Failure to Implement the Experience and Qualification Requirements of the Quality Assurance Program (Section 4OA2)
05000247/2010-005-06	FIN	Inadequate Main Boiler Feed Pump Speed Controller Setting (Section 4OA3)
05000247/2010-005-07	NCV	Failure to Staff the Site TSC and OSC Within 60 Minutes of an Alert Emergency Declaration (Section 4OA3)
05000247/2010-005-08	NCV	Failure of Offsite Notification Procedure to Meet the Requirements of the Site Emergency Plan Section 4OA3)
05000247/2010-005-09	NCV	Failure to Meet TS Oversight Requirement (Section 4OA5)

Closed

05000247/2010-007-00	LER	Automatic Reactor Trip Due to a Turbine Trip as a Result of a High Steam Generator Level Trip After Transition to Single Feedwater Pump Operation (Section 4OA3)
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05000247/2010-002-02 URI Refueling Cavity Leakage into Containment
(Section 4OA2)

LIST OF DOCUMENTS REVIEWED

Common Documents Used

Indian Point Unit 2 Updated Final Safety Analysis Report
Indian Point Unit 2 Individual Plant Examination
Indian Point Unit 2 Individual Plant Examination of External Events
Indian Point Unit 2 Technical Specifications and Bases
Indian Point Unit 2 Technical Requirements Manual
Indian Point Unit 2 Control Room Narrative Logs
Indian Point Unit 2 Plan of the Day

Section 1R01: Adverse Weather Protection

Procedures

2-AOP-FLOOD-1, Flooding, Rev. 6
IP-SMM, Event Notification and Reporting, Rev. 11
OAP-008, Severe Weather Preparations, Rev. 7

Condition Reports (CR-IP2-)

2010-07288

Miscellaneous

IP-RPT-04-00230, Indian Point Unit 2 Probabilistic Safety Assessment, Rev. 1
Operator Control Room Logs, December 1, 2010

Section 1R04: Equipment Alignment

Procedures

2-COL-4.1.1, Component Cooling System, Rev. 24
2-COL-27.3.1, Diesel Generators, Rev. 25
2-COL-27.6, Unit 2 Appendix R Diesel Generator, Rev. 00

Condition Reports (CR-IP2-)

2010-06246 2010-06268 2010-06534

Drawings

D253798, Emergency Diesel Generator Starting Air to Diesel #22, Rev. 3
D253801, Emergency Diesel Generator Lube Oil to Diesel #22, Rev. 5
D253804, Emergency Diesel Generator Jacket Water to Diesel #22, Rev. 6

Section 1R05: Fire Protection

Procedures

EN-DC-161, Control of Combustibles, Rev. 4
IP2-RPT-03-00015, IP2 Fire Hazards Analysis, Rev. 2

Condition Reports (CR-IP2-)

2010-06830

Pre Fire Plan

PFP-216, General Floor Plan – Fan House – 72'0", 80'0", 88'0" and 90'0" Elevations, Rev. 0

PFP-252A, Battery Rooms – Control Building – 33'0" Elevation, Rev. 0

PFP-260, Chemical Additive Room – Auxiliary Feedwater Building – 32'6" Elevation, Rev. 0

PFP-261, Auxiliary Feedwater Building – 43'0" and 53'0" Elevations, Rev. 0

PFP-262, Auxiliary Feedwater Building – 64'0" and 77'0" Elevations, Rev. 0

Section 1R06: Flood Protection Measures

Procedures

2-AOP-FLOOD-1, Flooding, Rev. 6

OAP-008, Severe Weather Preparations, Rev. 7

Condition Reports (CR-IP2-)

2010-06872 2010-07033

Work Orders

255970

Miscellaneous

Design Basis Document for 480 Volt Electrical System, Rev. 1

Individual Plant Examination for External Events for Indian Point Unit 2

IP-RPT-04-00230, Indian Point Unit 2 Probabilistic Safety Assessment, Rev. 1

Safety Evaluation Report – Susceptibility of Safety-Related Systems to Flooding From Failure of
Non-Category I Systems, Indian Point Unit 2, August 21, 2001

System Health Report, 480 Volt, 2nd Quarter 2010

Section 1R07: Heat Sink Performance

Procedures

SEP-SW-001, NRC Generic Letter 89-13 Service Water Program, Rev. 3

Condition Reports (CR-IP2-)

2010-06245 2010-06247

Work Orders

52031271 52231423 52231424

Miscellaneous

GL 89-13, Service Water System Problems Affecting Safety-related Equipment

Section 1R11: Licensed Operator Requalification Program

Procedures

2-AOP-INST-1, Instrument/Controller Failures, Rev. 6

2-AOP-RSD-1, Rapid Shutdown, Rev. 3

2-AOP-SG-1, Steam Generator Tube Leak, Rev. 11

2-E-0, Reactor Trip or Safety Injection, Rev. 3

2-E-2, Faulted Steam Generator Isolation, Rev. 0

2-E-3, Steam Generator Tube Rupture, Rev. 1
 2-POP-2.1, Operation at Greater Than 45% Power, Rev. 57

Condition Reports (CR-IP2-)

2008-05504 2010-06029 2010-06049 2010-06064 2010-06068

Miscellaneous

EN-TQ-201, Systematic Approach to Training Process, Rev. 13
 EN-TQ-202, Simulator Configuration Control, Rev. 7
 EN-TQ-114, Licensed Operator Requalification Training Program Description, Rev. 3
 EN-TQ-210, Conduct of Simulator Training, Rev. 3
 IPEC Simulator Evaluated Scenario, Lesson LRQ-SES-35, Rev. 2
 LRQ Sample Plan for 2009 Comprehensive Written Exam
 LRQ Sample Plan for 2010 Annual Operating Exam
 OAP-032, Operations Training Program, Rev. 11

Simulator Maintenance and Testing

0-TQ-SM-106, 2009 Core Performance Test, Rev 4
 DR 2010-0040, Reactor Trip Comparison to Simulator Response
 Simulator Steady State Test 14.03.03.01, 2010 Steady State Operability Test, Rev 1
 Simulator Normal Operations Test 14.3.7.2, 2010 Reactor Startup, Rev 1
 Simulator Surveillance Test PT-M45, 2010 Containment Sump Pumps, Rev 1
 Simulator Malfunction Test 14.04.07.19.01, 2010 Area Rad. Monitor Failure, Rev 0
 Simulator Malfunction Test 14.04.07.17.11, 2010 RCS Flow Transmitter Failure, Rev 0
 Simulator Transient Test 14.3.9.13, 2010 LOCA with Blackout, Rev 4
 Simulator Transient Test 14.3.9.14, 2010 Pzrr PORV Fails Open without High Head, Rev 4

Section 1R12: Maintenance Effectiveness

Procedures

0-LUB-401-GEN, Lubrication of Plant Equipment, Rev. 8
 2-E-3, Steam Generator Tube Rupture, Rev. 1
 2-SOP-5.4.1, Vapor Containment Pressure Reliefs, Rev. 17
 2-VLV-001-AOV, Fisher 10" Butterfly Valve Maintenance for PCV-1190, 1191 and 1192, Rev. 2
 EN-DC-205, Maintenance Rule Monitoring, Rev. 2
 EN-MP-100, Critical Procurements, Rev. 8
 OAP-115, Operations Commitments and Policy Details, Rev. 11

Completed Procedures

2-PT-Q013-DS149, PCV-1190, PCV-1191, PCV-1192, SOV-1279, and SOV-1280 IST Data
 Sheet, Rev. 26

Condition Reports (CR-IP2-)

2006-04723	2006-06322	2008-04145	2010-03795	2010-03829	2010-03881
2010-04007	2010-04038	2010-04290	2010-04333	2010-04395	2010-04480
2010-04747	2010-04762	2010-04830	2010-04935	2010-05118	2010-05458
2010-05519	2010-05694	2010-05696	2010-05697	2010-06658	2001-10724

Work Orders

00164445 00239756 00242501

Drawings

9321-F-2017, Flow Diagram – Main Steam, Rev. 84

Miscellaneous

Critical Procurement Plan for 21 Reactor Coolant Pump Motor Replacement in 2R19
LO-CAR-2010-00081

Maintenance Rule Basis Document Main Steam, Rev. 2

Maintenance Rule Basis Document for Reactor Coolant System, Rev. 2

Operational Decision Making Instruction for RCP-21 Upper Oil Reservoir Elevated Bearing
Temperatures, June 29, 2010

Reactor Coolant Pump 21 Upper Thrust Bearing Temperature Trend, June 23, 2010 –
September 2, 2010

R&G Laboratories, Oil Analysis Severity for Reactor Coolant Pump 21, August 11, 2010
System Health Report – HVAC – Central Control Room, 2nd Quarter 2010

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

EN-WM-104, On Line Risk Assessment, Rev. 1

IP-SMM-101, Online Risk Assessment, Rev. 3

OAP-008, Severe Weather Preparations, Rev. 6

Condition Reports (CR-IP2-)

2010-06274

Miscellaneous

Operator Narrative Logs, October 13, 2010

Operator Narrative Logs, October 14, 2010

Operator Narrative Logs, November 4, 2010

Operator Narrative Logs, November 14, 2010

Operator Narrative Logs, December 1, 2010

Operator's Risk Report, October 13, 2010

Operator's Risk Report, October 14, 2010

Operator's Risk Report, November 4, 2010

Operator's Risk Report, November 14, 2010

Operator's Risk Report, December 1, 2010

Section 1R15: Operability Evaluations

Procedures

2-PT-V072, In-Service Test Relief Valve Tests, Rev. 2

EN-OP-104, Operability Determination Process, Rev. 4

EN-MA-133, Control of Scaffolding, Rev. 6

Condition Reports (CR-IP2-)

2010-03667 2010-05501 2010-05505 2010-05522 2010-05633 2010-05650

2010-05669 2010-05670 2010-05671 2010-05928 2010-05790 2010-05979

2010-06248 2010-06267 2010-06423 2010-06619

Work Orders

244302 52256617

Drawings

9321-F-2722, Flow Diagram – Service Water System, Rev. 125

Miscellaneous

System Health Report – Service Water, 2nd Quarter 2010

Section 1R18: Plant Modifications

Procedures

2-ARP-003, Diesel Generator, Rev. 8
2-SOP-27.3.1.2, 22 Emergency Diesel Generator Manual Operation, Rev. 23
2-TOP-016, 22 Emergency Diesel Generator Performance Test, Rev. 0
EN-DC-136, Temporary Modifications, Rev. 5

Condition Reports (CR-)

IP2-2006-07329 IP2-2010-04711 IP2-2010-06052 IP2-2010-06246
IP2-2010-06260 IP3-2010-02924

Work Orders

247503 52268854

Miscellaneous

IP-CALC-06-00329, Replacement of Emergency Diesel Generator Air Start Motors, Rev. 1
Standing Order 06-04, Emergency Diesel Generator Starting Air Pressure, December 27, 2006

Section 1R19: Post-Maintenance Testing

Procedures

2-PT-2Y008B, 22 Emergency Diesel Generator Mechanical Overspeed Trip, Rev. 4
2-PT-2Y045A, 21 Service Water Pump Full Flow Test, Rev. 2
2-PT-M021B, Emergency Diesel Generator 22 Load Test, Rev. 19
2-SOP-27.3.1.2, 22 Emergency Diesel Generator Manual Operation, Rev. 23
2-SOP-27.6, Unit 2 Appendix R Diesel Generator Operation, Rev. 6
IP-EP-115, Emergency Plan Forms, Rev. 27
IP-EP-AD40, Equipment Important to Emergency Response, Rev. 5
IP-EP-310, Dose Assessment, Rev. 10
IP-RPT-07-00018, IP2 Inservice Test Program, Rev. 0
IPEC Emergency Plan, Revision 09-01
IPEC Unit 2 Technical Requirements Manual
IP-EP-115, Emergency Plan Forms, Revision 27
IP-EP-310, Dose Assessment, Revision 10
IP-EP-AD40, Equipment Important to Emergency Response, Revision 5

Completed Procedures

2-PC-EM29, Wide Range Gas Effluent Radiation Monitor R-27 Transfer Calibration, Rev. 8,
November 10, 2010
2-PT-2Y008B, 22 Emergency Diesel Generator Mechanical Overspeed Trip, Rev. 4,
October 12, 2010
2-PT-2Y043, Appendix R DG Rated Load Test, Rev. 0, October 8, 2010
2-PT-2Y045A, 21 Service Water Pump Full Flow Test, Rev. 2, October 27, 2010
2-PT-M021B, Emergency Diesel Generator 22 Load Test, Rev. 19, October 13, 2010
Work Order 52215074, 24 Service Water Pump 480V Breaker, October 29, 2010

Condition Reports (CR-IP2-)

2010-05621	2010-06052	2010-06209	2010-06246	2010-06260	2010-06417
2010-06685	2010-06696	2010-06716	2010-06718	2010-06721	2010-06722

Work Orders

00202596	00249703	52215074	52246863	52255456	52255457
52262112	52268693	52273344			

Drawings

9321-F-2722, Flow Diagram, Service Water System, Rev. 125
D262583, Steam Generator Narrow Range Level – CH.2, Rev. 5

Miscellaneous

Contingency Action for Determining a Release While R-27 is Out of Service for E-Plan Purposes (dated November 3, 2010)
Interim Guidance for When Radiation Monitor R-27 is Out of Service for Declaring an Emergency Action Level (EAL) (dated November 24, 2010)

Section 1R20: Refueling and Outage ActivitiesCompleted Procedures

2-PT-V53, Mode Change Checklist, Mode 3 to Mode 2, Rev. 7, November 22, 2010
IP-SMM-OP-105, Post Transient Evaluation, Rev. 6, November 18, 2010

Procedures

2-POP-1.2, Reactor Startup, Rev. 55
2-POP-1.3, Plant Startup from Zero To 45% Power, Rev. 82
2-POP-2.1, Operation at Greater Than 45% Power, Rev. 57
2-POP-3.1, Plant Shutdown from 45% Power, Rev. 54
2-POP-3.3, Plant Cooldown – Hot to Cold Shutdown, Rev. 75
EN-OM-123, Fatigue management Program, Rev. 3

Condition Reports (CR-IP2-)

2010-06764 2010-06801

Work Orders

00255970 00256247

Miscellaneous

EmpCenter Fatigue Management Software
Outage Schedule for 21 Main Transformer Replacement, November 9, 2010

Section 1R22: Surveillance TestingCompleted Procedures

0-SOP-LEAKRATE-001, RCS Leakrate Surveillance, Evaluation and Leak Identification, Rev. 1, December 4, 2010
0-SOP-LEAKRATE-001, RCS Leakrate Surveillance, Evaluation and Leak Identification, Rev. 1, December 5, 2010
0-SOP-LEAKRATE-001, RCS Leakrate Surveillance, Evaluation and Leak Identification, Rev. 1, December 12, 2010

2-PC-2Y1, RCS Alternate Safe Shutdown Temperature Monitor Calibration, Rev. 7, September 17, 2008

2-PT-Q013, Inservice Valve Tests, Data Sheet 43, Rev. 45, October 19, 2010

2-PT-Q017C, Alternate Safe Shutdown Supply Verification to 23 CCP, Rev. 11, September 1, 2010

2-PT-Q028A, 21 Residual Heat Removal Pump, Rev. 18, October 18, 2010

PC-2Y1, RCS Alternate Safe Shutdown Temperature Monitor Calibration, Rev. 6, May 22, 2008

Procedures

2-OSP-4.1.2, Support Procedure – Component Cooling System Operation, Rev. 4

2-SOP-4.1.2, Component Cooling System Operation, Rev. 35

Condition Reports (CR-IP2-)

2008-02757 2010-05446 2010-05695 2010-05822

Drawings

A227968, D/C for Alternate Safe Shutdown System Source Range Monitor Hot and Cold Leg Resistance Temperature Detectors, Rev. 4

Section 1EP6: Drill Evaluation

Procedures

2-AOP-INST-1, Instrument/Controller Failures, Rev. 6

2-AOP-RSD-1, Rapid Shutdown, Rev. 3

2-AOP-SG-1, Steam Generator Tube Leak, Rev. 11

2-E-0, Reactor Trip or Safety Injection, Rev. 3

2-E-2, Faulted Steam Generator Isolation, Rev. 0

2-E-3, Steam Generator Tube Rupture, Rev. 1

2-POP-2.1, Operation at Greater Than 45% Power, Rev. 57

Miscellaneous

IPEC Simulator Evaluated Scenario, Lesson LRQ-SES-35, Rev. 2

Sections 2RS1/2RS2: Radiological Hazard Assessment and Exposure Controls/Occupational ALARA Planning and Controls

Procedures

EN-RP-101, Access Control for Radiological Controlled Areas, Rev. 5

EN-RP-105, Radiological Work Permits, Rev. 9

EN-RP-110, ALARA Program, Rev. 7

EN-RP-110-01, ALARA Initiative Deferrals

Condition Reports (CR-IP2)

2010-1165 2010-1336 2010-1640 2010-1905 2010-1932 2010-1933

2010-1940 2010-2055 2010-2817 2010-2822 2010-2997 2010-3300

2010-3864 2010-4746 2010-6119

Condition Reports (CR-IP3)

IP3-2010-1995

Miscellaneous

QA-14/15-2009-IP-1, Quality Assurance Audit of IPEC Radiation Protection and Radwaste

Attachment

Section 40A1: Performance Indicator Verification

Procedures

EN-LI-114, Performance Indicator Process, Rev. 4

Miscellaneous

Barrier Integrity Indicator Consolidated Data Entry Reports – Reactor Coolant System Leakage,
October 2009 – September 2010

Mitigating Systems Performance Indicator Consolidated Data Entry Reports – Cooling Water
Support, October 2009 – September 2010

Mitigating Systems Performance Indicator Consolidated Data Entry Reports – Heat Removal,
October 2009 – September 2010

Operator Narrative Logs, October 2009 – September 2010

Section 40A2: Identification and Resolution of Problems

Procedures

EN-LI-102, Corrective Action Process, Rev. 15

EN-LI-121, Entergy Trending Process, Rev. 8

EN-MA-102, Inspection Program, Rev. 3 and 4

EN-OP-115, Conduct of Operations, Rev. 9

EN-QV-100, Conduct of Nuclear Oversight, Rev. 4

EN-QV-109, Audit Process, Rev. 16

EN-QV-109-02, Audit Process Guidance, Rev. 0

EN-QV-111, Training and Certification of Inspection/Verification and Examination Personnel,
Rev. 8

EN-QV-117, Oversight Training Program, Rev. 9

EN-QV-119, Corrective Action Requests, Supplier Stop Work Orders, and Recommendations,
Rev. 6

EN-QV-123, Supplier Audits/Surveys, Rev. 3

EN-QV-128, Assessment of Nuclear Oversight, Rev. 2

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LIST OF ACRONYMS

ADAMS	Agencywide Document and Management System
ALARA	As Low As Reasonably Achievable
CA	Corrective Action
CAP	Corrective Action Program
CARB	Corrective Action Review Board
CCR	Central Control Room
CFR	Code of Federal Regulations
CR	Condition Report
CRG	Condition Review Group
CRS	Control Room Supervisor
DG	Diesel Generator
DRA	Deputy Regional Administrator
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EP	Emergency Plan
EPIP	Emergency Plan Implementing Procedure
ERO	Emergency Response Organization
FRV	Feed Regulation Valve
FSB	Fuel Storage Building
Holtec	Holtec International
HRA	High Radiation Area
IMC	Inspection Manual Chapter
IPEC	Indian Point Energy Center
ISFSI	Independent Spent Fuel Storage Installation
JPM	Job Performance Measures
MBFP	Main Boiler Feed Pump
MPC	Multipurpose Canister
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute, Inc.
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PCV	Pressure Control Valve
PPF	Pre-Fire Plan
PI	Performance Indicator
PMT	Post-Maintenance Testing
PTRG	Post-Trip Review Group
QP	Augmented Quality
RA	Regional Administrator
RCS	Reactor Coolant System
RECS	Radiological Emergency Communication System
RETS	Radiological Effluent Technical Specification
RO	Reactor Operator
RSPS	Risk Significant Planning Standard
RWP	Radiation Work Permit
SGI	Safeguards Information
SI	Safety Injection
SRO	Senior Reactor Operator
SS	Shift Supervisor

SSC	Structure, System, and Component
SWP	Service Water Pump
TRM	Technical Requirements Manual
TS	Technical Specifications
UFSAR	Updated Final Safety Evaluation Report
URI	Unresolved Item
VHRA	Very High Radiation Area
WO	Work Order