

November 13, 2006

Mr. Fred R. Dacimo  
Site Vice President  
Entergy Nuclear Operations, Inc.  
Indian Point Energy Center  
295 Broadway, Suite 1  
P.O. Box 249  
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT 2 - NRC INTEGRATED  
INSPECTION REPORT NO. 05000247/2006004

Dear Mr. Dacimo:

On September 30, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Indian Point Nuclear Generating Unit 2. The enclosed integrated inspection report documents the inspection results, which were discussed on October 4, 2006, with Mr. Paul Rubin 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.

Based on the results of this inspection, two findings of very low safety significance (Green) were identified. These findings did not involve violations of NRC requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Eugene W. Cobey, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000247/2006004  
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.: 05000247/2006004

Licensee: Entergy Nuclear Northeast (Entergy)

Facility: Indian Point Nuclear Generating Unit 2

Location: 295 Broadway, Suite 3  
Buchanan, NY 10511-0308

Dates: July 1, 2006 - September 30, 2006

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T. Hipschman, Senior Resident Inspector, Indian Point 3  
G. Bowman, Resident Inspector, Indian Point 2  
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Approved by: Eugene W. Cobey, Chief  
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## SUMMARY OF FINDINGS

IR 05000247/2006004; 07/01/2006 - 09/30/2006; Indian Point Nuclear Generating Unit 2; Event Follow Up.

The report covered a three-month period of inspection by resident inspectors and regional specialist inspectors. Two Green findings 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). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Initiating Events

- Green. A Green self-revealing finding was identified because Entergy failed to develop adequate procedures for governing the response to a loss of both heater drain tank pumps and to an approaching rod insertion limit (RIL) alarm condition. Specifically, the procedure governing operator actions during a loss of heater drain tank pumps did not specify for the operators to reset the steam dumps following the rapid downpower. The alarm response procedure for the approaching rod insertion limit condition directed the operators to place the rod control system in manual to stop further automatic inward rod motion. This impacted operators ability to add negative reactivity and control the transient. Entergy entered these procedural deficiencies into their corrective action program and is evaluating the appropriate steps to correct the procedural deficiencies.

The inspectors determined that this finding is greater than minor because it is associated with the Procedure Quality attribute of the Initiating Events cornerstone; and, it impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions. Specifically, the procedural inadequacies complicated operator actions to a rapid downpower, resulted in a manual reactor trip when the operators determined that they did not have sufficient control of the transient, and could impact other accident sequences requiring negative reactivity addition. The inspectors evaluated this finding using Phase I of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined it to be of very low safety significance because it did not contribute to the likelihood of both a reactor trip and the likelihood that mitigation equipment or functions would be unavailable. The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Entergy did not ensure that plant operating procedures were adequate to ensure operators could appropriately respond to a rapid downpower transient. (Section 4OA3.1)

- Green. A Green self-revealing finding was identified because Entergy failed to develop an accurate procedure for calibration of the steam dump loss of load controller. This resulted in the steam dumps failing to operate properly during a plant transient, complicating operator response, and leading to a manual reactor

trip. Following identification of the issue, Entergy entered the issue into the corrective action program, corrected the procedural deficiency, and re-calibrated the controller.

The inspectors determined that this finding is greater than minor because it is associated with the Procedural Quality attribute of the Initiating events cornerstone; and, it impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions. Specifically, the inadequacy in Entergy's calibration procedure caused the steam dumps to operate improperly during a plant transient and contributed to a reactor trip. The inspectors evaluated this finding using Phase I of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined it to be of very low safety significance because it did not contribute to the likelihood of both a reactor trip and the likelihood that mitigation equipment or functions would be available. The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Entergy did not ensure that the procedure for calibration of the steam dump loss of load controller was accurate, in that, it specified incorrect settings for the controller. (Section 4OA3.2)

B. Licensee-Identified Violations

None.

## REPORT DETAILS

### Summary of Plant Status

Indian Point Nuclear Generating Unit 2 began the inspection period operating at full power. On August 23, 2006, the reactor was manually tripped following the loss of both heater drain tank pumps and a malfunction in the steam dump valve control system. Full power was restored on August 25, 2006, and the plant continued to operate at or near full power for the remainder of the inspection period.

#### 1. **REACTOR SAFETY**

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

#### 1R01 Adverse Weather Protection (71111.01 - 2 samples)

##### a. Inspection Scope

The inspectors completed the following two adverse weather protection samples.

- Because thunderstorms with potential tornados were forecast in the vicinity of the facility for July 12, 2006, the inspectors reviewed Entergy's preparations for inclement weather conditions. The inspectors walked down portions of the service water system, the gas turbines, and emergency diesel generators. These systems were selected because their safety-related functions could be affected by adverse weather. The inspectors reviewed documents listed in the Attachment and observed plant conditions, evaluating those conditions using criteria documented in OAP-008, "Severe Weather Preparations," Revision 0. The inspectors also toured the plant grounds for loose debris, which could become missiles during a tornado, and ascertained if operators could access controls and indications for those systems required for safe control of the plant.
- The inspectors reviewed and verified Entergy's completion of the operations department warm weather preparation checklist contained in procedure OAP-008, "Severe Weather Preparations." The inspectors reviewed the procedural limits and actions associated with elevated temperatures, walked down accessible areas of plant structures to assess the effectiveness of the ventilation systems, and reviewed calculations supporting equipment operability. The walkdowns included discussions with operations and engineering personnel to ensure that they were aware of temperature restrictions and required actions. The documents reviewed as part of this inspection are listed in the Attachment.

##### b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04Q - 3 samples)a. Inspection Scope

The inspectors performed three partial system walkdowns to verify the operability of redundant or diverse trains and components during periods of system train unavailability or following periods of maintenance. The inspectors referenced the system procedures, the Updated Final Safety Analysis Report (UFSAR), and system drawings in order to verify that the alignment of the available train was proper to support its required safety functions. The inspectors also reviewed applicable condition reports and work orders to ensure that Entergy had identified and properly addressed equipment discrepancies that could potentially impair the capability of the available train. The documents reviewed are listed in the Attachment. The inspectors performed a partial walkdown of the following systems which represents three inspection samples:

- 21 and 23 component cooling water pump trains with 22 component cooling water pump out of service for maintenance;
- 21 and 23 safety injection pump trains with the 22 safety injection pump out of service for maintenance; and
- 21 and 23 emergency diesel generators with the 22 emergency diesel generator out of service for maintenance.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q - 7 samples)a. Inspection Scope

The inspectors conducted tours of the seven areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with Entergy's administrative procedures; fire detection and suppression equipment was available for use; that passive fire barriers were maintained; and that compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with Entergy's fire plan. The inspectors used procedure ENN-DC-161, "Transient Combustible Program," in performing the inspection. The inspectors evaluated the fire protection program against the requirements of license condition 2.k. The documents reviewed are listed in the Attachment.

This inspection satisfied seven inspection samples for fire protection tours. The areas inspected included:

- Fire zone 1;
- Fire zone 9;
- Fire zone 10;
- Fire zones 23 and 62A;
- Fire zone 650;
- Fire zone 6A; and
- Fire zones 22 and 63A.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample)

a. Inspection Scope

The inspectors reviewed Indian Point Unit 2's Individual Plant Examination of External Events and the UFSAR concerning external flooding events. The inspection included a walkdown of accessible areas of the plant to look for potential susceptibilities to external flooding and to verify the assumptions included in the site's external flooding analysis. The inspectors also reviewed relevant abnormal operating and emergency plan procedures. The documents reviewed are listed in the Attachment. This inspection represented one inspection program sample.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the testing and evaluation of test results for the containment fan cooler units. Procedure 2-PT-Q16, "Containment Fan Cooler Unit Cooling Water Flow Test," Revision 0, is performed on a quarterly basis to verify safety-related unit cooler flow requirements. In addition, Entergy conducts an inspection of each unit every six years. Visual and eddy current inspections are conducted. The inspectors reviewed performance data to verify that heat exchanger operation was consistent with design. The inspectors evaluated heat sink performance against Generic Letter 89-13, "Service Water System Problems Affecting Safety Related Equipment," and the UFSAR. The documents reviewed are listed in the Attachment. This review represents one inspection sample.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11Q - 1 sample, 71111.11S - 1 sample)

.1 Quarterly Inspection (1 sample)

a. Inspection Scope

On August 29, 2006, the inspectors observed licensed operator simulator training to assess operator performance during several scenarios to verify that operator performance was adequate and that evaluators were identifying and documenting crew performance problems. The inspectors evaluated the performance of risk significant operator actions, including the use of emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, the implementation of appropriate actions in response to alarms, the performance of timely control board operation and manipulation, and the oversight and direction provided by the shift manager. The inspector also reviewed simulator fidelity to evaluate the degree of similarity to the actual control room. Licensed operator training was evaluated against the requirements of 10 CFR 55, "Operators' Licenses." The documents reviewed are listed in the Attachment. This observation of operator simulator training constituted one inspection sample.

b. Findings

No findings of significance were identified.

.2 Biennial Inspection (1 sample)

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, Revision 9, "Operator Licensing Examination Standards for Power Reactors," Inspection Procedure Attachment 71111.11, "Licensed Operator Requalification Program," NRC Inspection Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)," and 10 CFR 55.46 Simulator Rule (sampling basis) as acceptance criteria.

The inspectors reviewed documentation of operating history since the last requalification program inspection. The inspectors also discussed facility operating events with the resident staff. Documents reviewed included NRC inspection reports, plant performance insights, licensee event reports (LERs), and licensee condition reports (CRs) that involved human performance issues for licensed operators to ensure that operational events were not indicative of possible training deficiencies.

The inspectors reviewed three exam sets (i.e., weeks 2, 5, and 6) for both the comprehensive reactor operator and senior reactor operator biennial written exams, as well as scenarios and job performance measures administered during this current exam cycle to ensure the quality of these exams met or exceeded the criteria established in the Examination Standards and 10 CFR 55.59.

During the onsite weeks of this inspection, the inspectors observed the administration of operating examinations to operating crews "B" and "C." The operating examinations consisted of three simulator scenarios for each crew and five job performance measures administered to each individual. The documents that were reviewed are listed in the Attachment.

#### Conformance with Simulator Requirements Specified in 10 CFR 55.46

For the site specific simulator, the inspectors observed simulator performance during the conduct of the examinations, and discrepancy reports to verify compliance with the requirements of 10 CFR 55.46.

The inspectors reviewed simulator maintenance, testing and control procedures and discussed simulator maintenance, testing, configuration control and machine operation with members of the simulator maintenance staff. The inspectors also reviewed a sample of simulator tests including transients, core performance, computer real time, steady state, and scenario-based tests and verified that a sample of completed simulator deficiency item condition reports from the past two-year period effectively addressed the described issues. The simulator tests reviewed are listed in the Attachment.

#### Conformance with operator license conditions was verified by reviewing the following records:

- A sample of two remediation training packages for the past two-year training cycle was reviewed.
- The inspectors conducted a review of proficiency watch-standing and reactivation records including a sample of licensed operator reactivation records and a random sample of watch-standing documentation for time on shift to verify currency and conformance with the requirements of 10 CFR 55.

Licensee's Feedback System. The inspectors interviewed instructors, training and operations management personnel, and four operators (i.e., two reactor operators and two senior reactor operators) for feedback regarding the implementation of the licensed operator requalification program to ensure the requalification program was meeting their needs and responsive to their noted deficiencies and recommended changes.

The results of the annual operating exam were assessed to ensure that pass rates were consistent with the guidance of NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)." The inspectors verified that:

- Crew failure rate on the dynamic simulator was less than 20% (Failure rate was 0.0%.);
- Individual failure rate on the dynamic simulator test was less than or equal to 20% (Failure rate was 0.0%.);

- Individual failure rate on the walkthrough test (JPMs) was less than or equal to 20% (Failure rate was 0.0%.); and
- More than 75% of the individuals passed all portions of the exam (100.0% of the individuals passed all portions of the exam).

b. Findings and Observations

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q - 3 samples)

a. Inspection Scope

The inspectors reviewed performance-based problems involving selected in-scope structures, systems, or components (SSCs) to assess the effectiveness of the maintenance program. Reviews focused on:

- Proper Maintenance Rule Scoping in accordance with 10 CFR 50.65;
- Characterization of reliability issues;
- Changing system and component unavailability;
- 10 CFR 50.65 (a)(1) and (a)(2) classifications;
- Identifying and addressing common cause failures;
- Trending of system flow and temperature values;
- Appropriateness of performance criteria for SSCs classified (a)(2); and
- Adequacy of goals and corrective actions for SSCs classified (a)(1).

The inspectors reviewed system health reports, maintenance backlogs, and Maintenance Rule basis documents. The inspectors evaluated the maintenance program against the requirements of 10 CFR 50.65. The documents reviewed are listed in the Attachment. The following three maintenance rule samples were reviewed:

- 118 volts alternating current (VAC) instrument supply inverters;
- Steam generator atmospheric dump valves; and
- 345 kilo-volts alternating current (kVAC) electrical distribution system.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 4 samples)

a. Inspection Scope

The inspectors reviewed the following four activities to verify that the appropriate risk assessments were performed prior to removing equipment for work. The inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4), and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The documents

reviewed are listed in the Attachment. The following activities represent four inspection samples:

- Work order (WO)-IP2-06-01431, 138 kVAC cross-tie line 33332L out of service with the 32 emergency diesel generator out of service;
- WO-IP2-06-27268, steam dump controller troubleshooting and repair activities;
- Condition Report (CR)-IP2-06-5300, indicated pressurizer pressure lowering due to suspected loss of inventory in pressurizer reference leg; and
- WO-IP2-06-28160, 22 auxiliary boiler feedwater pump cooling water supply valve repair.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 4 samples)

a. Inspection Scope

The inspectors reviewed operability determinations to assess the acceptability of the evaluations; when needed, the use and control of compensatory measures; and compliance with Technical Specifications. The inspectors' review included a verification that the operability determinations were made as specified by ENN-OP-104, "Operability Determinations." The technical adequacy of the determinations was reviewed and compared to the Technical Specifications, UFSAR, and associated design basis documents. The documents reviewed are listed in the Attachment. The following four evaluations were reviewed and each constituted inspection program samples:

- Condition Report (CR)-IP2-2006-04402, environmental qualification of post-accident monitoring instrumentation;
- CR-IP2-06-05241, 22 auxiliary boiler feedwater pump following five minute run with degraded bearing cooling water;
- CR-IP2-04-06167 and -06776, degradation in service water supply to 21 and 23 emergency diesel generators; and
- CR-IP2-06-04581, low air pressure to 21 emergency diesel generator right hand air starting motor.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed post maintenance test procedures and associated testing activities for selected risk significant mitigating systems to assess whether the effect of maintenance on plant systems was adequately addressed by control room and engineering personnel. The inspectors verified that test acceptance criteria were clear,

demonstrated operational readiness and were consistent with design basis documentation; that test instrumentation had current calibrations and the range and accuracy for the application; and that tests were performed, as written, with applicable prerequisites satisfied. Upon completion, the inspectors verified that equipment was returned to the proper alignment necessary to perform its safety function. Post-maintenance testing was evaluated against the requirements of 10 CFR 50, Appendix B Criterion XI, "Test Control." The documents reviewed are listed in the Attachment. The following post maintenance test activities were reviewed and represent six inspection program samples:

- WO-IP2-06-000954, steam generator atmospheric dump valve PCV-1134 following in-service test failure;
- WO-IP2-05-23299, 21 auxiliary boiler feedwater pump following maintenance;
- WO-IP2-05-21977, 22 safety injection pump following preventive maintenance; and
- WO-IP2-05-24095, 23 component cooling water pump following preventive maintenance;
- WO-IP2-05-23473, gas turbine 3 following maintenance; and
- WO-IP2-04-30457, safety injection valve SI888A following maintenance.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 6 samples)

a. Inspection Scope

The inspectors witnessed performance of surveillance tests and/or reviewed test data of selected risk-significant systems, structures, and components to assess whether the systems, structures, and components satisfied Technical Specifications, UFSAR, Technical Requirements Manual, and Entergy procedure requirements. The inspectors verified that test acceptance criteria were clear, demonstrated operational readiness and were consistent with design basis documentation; that test instrumentation had current calibrations and the range and accuracy for the application; and that tests were performed, as written, with applicable prerequisites satisfied. Upon surveillance test completion, the inspectors verified that equipment was returned to the status specified to perform its safety function. The inspectors evaluated the surveillance tests against the requirements in Technical Specifications. The following surveillance tests were reviewed and represented six inspection program samples:

- 2-PT-2M2A, "RPS Logic Train 'A' Actuation Logic and Trip Actuation Device Operational Test (TADOT) (> 25% Reactor Power)," Revision 0;
- 2-PT-Q030B, "21 Component Cooling Water Pump," Revision 13;
- 2-PT-M7, "Analog Rod Position Functional," Revision 27;
- PT-M38C, "Gas Turbine No. 3," Revision 4;
- 2-PT-M021A, "Emergency Diesel Generator 21 Load Test," Revision 15; and
- PT-MT55, "Fire Door Surveillance," Revision 12.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - 2 samples)a. Inspection Scope

The inspectors assessed the adequacy of the 10 CFR 50.59 evaluations for these temporary modifications; that the installation was consistent with the modification documentation; that the drawings and procedures were updated as applicable; and that the post-installation testing was adequate. The inspectors assessed the temporary modification, any planned compensatory actions, and reviewed drawings to evaluate any potential impact on equipment indications, alarms, or protective functions. The documents reviewed are listed in the Attachment. This inspection satisfied two inspection samples for temporary modifications. The following modifications were reviewed:

- TM-2-2006-0084, "Isolation of Service Water Leak Upstream of System Drain Valve SWN-76-1;" and
- SOP-28.22, "Remove Saturation Monitor Core Exit Thermocouple Input From Scan."

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies  
(71114.05- 1 sample)a. Inspection Scope

A region-based specialist inspector conducted an inspection of Entergy's corrective actions related to the current Indian Point alert and notification system, and also of the progress made in the design and installation of the new siren system. The inspection was conducted onsite September 13 and 14, 2006, and in the Region I office the week of September 25, 2006, per the baseline inspection program deviation authorized by the NRC Executive Director of Operations in a memorandum approved on October 31, 2005.

The inspector discussed and reviewed two events during the quarter that involved the loss of the ability to actuate the sirens: one occurred on August 2, 2006, as the result of a system computer hard drive failure; and one occurred on September 7, 2006, as the result of a human performance issue which occurred during work to prepare for the installation of the new siren system. The inspector reviewed the condition reports and the corrective actions, for these two events. To assess the effectiveness of the

corrective actions and the performance of Entergy's siren system, the inspector observed the performance of the quarterly full siren test conducted on September 13, 2006. The inspector monitored the test from the Indian Point Energy Center Emergency Operations Facility (EOF) and observed the licensee's communication with the four local counties, the initiation of the siren system actuation, and the reception and logging of siren feedback information to determine the performance of the sirens.

Subsequent to the onsite portion of the inspection, the inspector learned of an additional failure of the siren system on September 19, 2006, as the result of the computer software database failing to reconnect following a preventive maintenance reboot of the siren system computer. The inspector conducted an initial in-office review of the event, but the licensee's corrective actions were not finalized prior to the end of the inspection period.

The inspector interviewed the project manager for the new siren system to understand Entergy's progress towards meeting the milestone dates required by the NRC's Confirmatory Order dated January 31, 2006. While on site, the inspector observed the progress of Entergy's installation of the new siren control system in the EOF. The inspector also reviewed the proposed final Indian Point Energy Center Prompt Alert and Notification System Design Report which Entergy had submitted to the New York State Emergency Management Office on September 28, 2006, for Department of Homeland Security review and approval.

b. Findings

No findings of significance were identified.

4. **OTHER ACTIVITIES [OA]**

4OA1 Performance Indicator Verification (71151 - 1 sample)

a. Inspection Scope

The inspectors reviewed performance indicator (PI) data for the below listed cornerstones and used Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guidance," to verify individual PI accuracy and completeness.

Initiating Events Cornerstone

- Unplanned Transients per 7000 Critical Hours

The inspectors reviewed a selection of LERs, operator log entries, monthly operating reports, and PI data sheets to determine whether Entergy adequately identified the number of unplanned power changes greater than 20 percent that occurred from July 2004 to June 2006. This number was compared to the number reported for the PI during the current quarter. The inspectors also verified the accuracy of the number of critical hours reported. In addition, the inspectors also interviewed Entergy personnel associated with the PI data collection, evaluation, and distribution.

#### 4OA2 Identification and Resolution of Problems (71152 - 1 sample)

##### .1 Annual Sample Review

###### a. Inspection Scope

The inspector conducted a detailed review of CR-IP2-2006-02133 which was written to address severe degradation of a non-safety-related service water pipe in the steam generator blowdown tank (SGBT) room. This issue was selected for review because failure of the pipe could have affected safety-related equipment. The inspector reviewed Entergy's causal analysis, operability evaluation, and the assigned corrective actions. The inspector toured the SGBT room and observed the repaired section of the degraded pipe with the service water system engineer. The inspector reviewed the design change package for the repair and the non-destruction examination records of the welding for the piping repair.

###### b. Findings and Observations

There were no findings or observations identified associated with the reviewed sample.

##### .2 Routine PI&R Program Review

###### a. Inspection Scope

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

###### b. Findings

No findings of significance were identified.

#### 4OA3 Event Followup (71153 - 1 sample)

##### .1 Unit 2 Manual Reactor Trip - August 23, 2006

###### a. Inspection Scope

The inspectors responded to a manual reactor trip following a loss of both heater drain tank pumps and the subsequent plant transient that occurred on August 23, 2006 and observed operator actions. Control room operators initiated a manual reactor trip in accordance with directions provided by the control room supervisor following an unexpected response in the steam dump control system. The inspectors discussed the trip with operations, maintenance, and engineering personnel to ensure the event was understood and to assess followup actions. The inspectors reviewed operator actions taken in accordance with licensee procedures and reviewed unit and system indications to verify that actions and system responses were as expected. The inspectors

discussed the trip with Entergy's root cause analysis team and assessed the team's actions to gather, review, and assess information leading up to and following the reactor trip. The inspectors also reviewed the initial investigation report and root cause determination to assess the detail of the review and the adequacy of the root cause and proposed corrective actions prior to unit restart. The inspectors also reviewed the initial licensee notification to verify that it met the requirements specified in NUREG-1022, "Event Reporting Guidelines."

b. Findings

- .1 Introduction: A Green self-revealing finding was identified because Entergy failed to develop an adequate procedure for governing the response by operators to a loss of both heater drain tank pumps and to an approaching rod insertion limit (RIL) alarm condition.

Description: On August 23, 2006, both heater drain tank pumps tripped due to a low heater drain tank level condition resulting from a level controller failure. The loss of these pumps led to a reduction of feed flow to the steam generators and required a reduction in power to mitigate lowering level in the steam generators. Per procedure 2-AOP-FW-1, "Loss of Main Feedwater," the operators rapidly reduced power to 77 percent (%). During the transient, the high pressure steam dumps and control rods operated to maintain average coolant temperature at the programmed value. Due to control rod insertion, an "approaching RIL" alarm was received in the control room. Per alarm response procedure 2-ARP-SAF, the operators placed the control rods in manual, which stopped automatic control rod insertion. Following the initial power reduction, operators noted that axial flux distribution was outside the value required by Technical Specification 3.2.3, "Power Distribution Limits - Axial Flux Difference," and determined that a power reduction to less than 50% was required. During the subsequent power reduction, operators noted a significant reduction in turbine power with no operator action. Operators determined that they did not have sufficient control of the transient, and manually tripped the reactor.

The inspectors reviewed plant transient data, operator actions, and the plant operating procedures used during the transient. The inspectors noted that the procedure flow path for a loss of both heater drain tank pumps in 2-AOP-FW-1, "Loss of Main Feedwater," did not direct operators to reset the high pressure steam dump arming signal following the rapid downpower. The steam dumps are designed to arm on a 10 percent step load drop or a 5 percent per minute power reduction, and then modulate open to control average coolant temperature. Failure to reset the arming signal resulted in the steam dumps actuating during the second downpower, when they should not have been required. In addition, the inspectors noted that placing the rod control system in manual when the "approaching RIL" alarm actuated, limited the operators' ability to maintain proper plant control during the transient. If left in automatic, the control rods would have driven in and added negative reactivity on an increasing average coolant temperature. With the control rods in manual, negative reactivity is provided by boron addition, which does not provide as timely a response as the control rods. The inspectors determined that these procedural deficiencies complicated the plant transient and impacted the operators' ability to effectively respond to plant conditions.

Analysis: The inspectors determined that Entergy's failure to develop adequate procedures to respond to a loss of both heater drain tank pumps and an "approaching RIL" alarm is a performance deficiency. IP-SMM-AD-102, "Indian Point Energy Center Implementing Procedure Preparation, Review, and Approval" requires that a technical review be conducted for site-specific implementing procedures. This review is required to verify the adequacy and technical accuracy of the subject procedure. It is reasonable that Entergy should have identified this procedural inadequacy. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements or Entergy's procedures.

The inspectors determined that this finding was greater than minor because it was associated with the Procedure Quality attribute of the Initiating Events cornerstone; and, it impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions. Specifically, the procedural inadequacies complicated operator actions to a rapid downpower, resulted in a manual reactor trip when the operators determined that they did not have sufficient control of the transient, and could impact other accident sequences requiring negative reactivity addition. The inspectors evaluated this finding using Phase 1 of Inspection Manual Chapter (IMC) 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined it to be of very low safety significance because it did not contribute to the likelihood of both a reactor trip and the likelihood that mitigation equipment or functions would be unavailable.

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Entergy did not ensure that plant operating procedures 2-AOP-FW-1 and 2-ARP-SAF were adequate to ensure operators could appropriately respond to a rapid downpower transient.

Enforcement: Because this finding is related to a procedural deficiencies associated with the non-safety related heater drain and feedwater systems, and the non-safety related portion of the rod control system, no violation of regulatory requirements occurred: **FIN 05000247/2006004-01, Inadequate Operating Procedure for Loss of Both Heater Drain Tank Pumps.**

Entergy entered this issue into the corrective action program as corrective action number IP2-2006-05065. Entergy is evaluating the appropriate steps to correct the procedural deficiencies.

- .2 Introduction: A Green self-revealing finding was identified because Entergy failed to develop an adequate procedure for calibrating the steam dump loss of load controller. An error in the calibration procedure caused the steam dumps to operate improperly during a plant transient and contributed to a manual reactor trip.

Description: On August 23, 2006, the plant experienced a loss of both heater drain tank pumps, which necessitated a rapid reduction in plant power. During the load reduction, the steam dump system failed to operate as expected. Specifically, the steam dump valves opened earlier and more rapidly than expected. This resulted in a large deviation between reactor power and generator load.

The steam dump loss of load controller is used, in conjunction with the rod control system, to control average coolant temperature following large changes in secondary load. The controller receives an arming signal when turbine load drops rapidly, and then sends a signal to the steam dump valves, causing them to modulate open if average coolant temperature exceeds the reference temperature by a set value. The controller is designed to have a lead time of 10 seconds, which allows the controller to respond to anticipated changes in average coolant temperature and start to open before the set error threshold is reached.

Following the reactor trip, the inspectors reviewed calibration procedures for the steam dump loss of load controller. It was identified that the calibration procedures inappropriately specified setting up the controller with a lead gain of 10, rather than a lead time of 10 seconds. The lead gain is a measure of the magnitude of controller output change for a given controller input change. As a result, the steam dump system response to changes in average coolant temperature was amplified by a factor of four, resulting in significant complications during the power reduction, and the subsequent reactor trip.

Analysis: The inspectors determined that Entergy's failure to develop a technically accurate procedure for calibration of the steam dump loss of load controller is a performance deficiency. IP-SMM-AD-102, "Indian Point Energy Center Implementing Procedure Preparation, Review, and Approval" requires that a technical review be conducted for site-specific implementing procedures. This review is required to verify the adequacy and technical accuracy of the subject procedure. It is reasonable that Entergy identify this deficiency since the correct calibration settings of this controller were specified in Westinghouse analyses. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements or Entergy's procedures.

The inspectors determined that this finding was greater than minor because it was associated with the Procedure Quality attribute of the Initiating Events cornerstone; and it impacted the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions. Specifically, the inadequacy in Entergy's calibration procedure caused the steam dumps to operate improperly during a plant transient and contributed to a reactor trip. This inspectors evaluated this finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined it to be of very low safety significance because it did not contribute to the likelihood of both a reactor trip and the likelihood that mitigation equipment or functions would be unavailable.

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Entergy did not ensure that the procedure for calibration of the steam dump loss of load controller was accurate, in that, it specified incorrect settings for the controller.

Enforcement: Because this finding is related to a procedural deficiency associated with the non-safety related steam dump system, no violation of regulatory requirements occurred: **FIN 05000247/2006004-02, Inadequate Procedure for Calibrating the Steam Dump Loss of Load Controller.**

Entergy entered this issue into the corrective action program as corrective action number IP2-2006-05065. Entergy corrected the procedure, and correctly calibrated and set up the steam dump loss of load controller prior to plant start up.

- .3 (Closed) LER 05000247/2006001-00, Manual Reactor Trip Due to Multiple Dropped Control Rods Caused by Loss of Control Rod Power Due to Personnel Error

On March 1, 2006, plant operators initiated a manual reactor trip following indications of 12 dropped control rods. The control rods dropped when a contractor employee assembling scaffolding in the cable spreading room inadvertently bumped a disconnect switch which interrupted power to rod control power supply cabinet 1AC. Entergy operators appropriately responded to the reactor trip, actions were taken to strengthen control of scaffold construction activities, and the issue was entered into the corrective action program (CR-IP2-06-01012). The inspectors previously reviewed this issue in Inspection Report 05000247/2006-002, and issued NCV 05000247/2006002-04, "Scaffolding Control Issue Results in Reactor Trip," because Entergy failed to adequately assess and manage the risk associated with scaffolding construction activities. The LER was reviewed by the inspectors and no additional findings of significance were identified. This LER is closed.

#### 4OA5 Other Activities

##### .1 Groundwater Contamination Investigation

###### a. Inspection Scope

Inspection of the groundwater contamination investigation at Indian Point Energy Center was authorized by the NRC Executive Director of Operations in a Reactor Oversight Process (ROP) deviation memorandum approved on October 31, 2005 (ADAMS Accession number ML053010404). Accordingly, oversight of licensee progress has been conducted throughout this inspection period consisting of weekly discussions with the licensee on groundwater investigation status and bi-weekly communications with Federal, State, and local government stakeholders. In addition, NRC continued to split samples of offsite, site boundary and other selected monitoring wells with the licensee in order to verify the licensee's sample results.

###### b. Results

The NRC's assessment of the licensee's sample data indicated that the licensee continued to report sample results that were consistent with NRC results. The Oak Ridge Institute for Science and Education, Environmental Site Survey and Assessment Program (ORISE/ESSAP) sample results are available in ADAMS under Accession Number ML062720227. To date, sample results from site boundary wells and off-site environmental groundwater sampling locations have not indicated any detectable plant-related activity.

- .2 (Closed) URI 05000247/2003003-04, Electrical Calculation Reconstitution to Support Off-Site Power Design Basis (SAT Load Tap Changer)

In August 2002, Entergy identified a concern associated with operability of the off-site electrical distribution system following a safety injection system actuation. Specifically, preliminary calculations showed that under certain expected grid voltage conditions, the voltage on the safety buses could drop below the degraded voltage relay setpoint for greater than 10 seconds. This would result in loss of the off-site power supply to the safety buses. Entergy identified a number of non-conservative assumptions in their original degraded grid calculation, including a failure to account for the fast bus transfer 30 seconds after the safety injection signal, instrument tolerances for the degraded voltage relays, and the neutral position of the load tap changer.

The inspectors reviewed calculation FEX-00143-01, "Indian Point Unit 2 (IP2) Load Flow Analysis of the Electrical Distribution System," Revision 1, which analyzed bus voltages for limiting transients. The inspectors verified that for the transients analyzed, voltage would either remain above the degraded voltage relay setting, or that operation of the load tap changer would restore voltage to above the degraded voltage relay reset point prior to off-site power separating from the buses. The inspectors confirmed that the non-conservative assumptions in the original calculation had been appropriately addressed in the revised calculation. The inspectors did not identify any issues associated with historical plant risk, or any issues meeting reportability requirements. This issue is closed.

#### 4OA6 Meetings, Including Exit

##### Exit Meeting Summary

On October 4, 2006, the inspectors presented the inspection results to Mr. Paul Rubin and other Entergy staff members, who acknowledged the inspection results presented. Entergy acknowledged that no proprietary information was involved.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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

F. Dacimo, Site Vice President  
 P. Rubin, General Manger of Plant Operations  
 E. O'Donnell, U2 Operations Manager  
 B. Christman, Manager of Training and Development  
 S. Davis, Superintendent of Operator Training  
 A. Singer, Operations Training Supervisor  
 D. Eccleston, Senior Operations Instructor  
 E. Goetchius, Senior Operations Instructor  
 D. Huntington, Senior Operations Instructor  
 R. Robenstein, Simulator Support Supervisor  
 J. Gullick, Senior Simulator Specialist  
 J. Rowland, Senior Simulator Specialist  
 T. Beasley, System Engineer  
 J. Kayani, System Engineer  
 B. Meek, Maintenance Supervisor  
 J. Bubniak, Senior Engineer  
 R. Scalone, Performance Engineering Supervisor  
 N. Azevedo, Code Program Supervisor  
 D. Gaynor, Senior Engineer  
 R. Lee, Senior Design Engineer  
 G. Dahl, Licensing Engineer  
 R. Mann, Programs and Components Engineer  
 T. Pepe, Programs and Components Engineer  
 J. Joy, Programs and Components Engineer

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**Opened and Closed

05000247/2006004-01	FIN	Inadequate Operating Procedures for Loss of Both Heater Drain Tank Pumps (Section 1R13)
05000247/2006004-02	FIN	Inadequate Procedure for Calibrating the Steam Dump Loss of Load Controller (Section 1R13)
Closed		
05000247/2006001-00	LER	Manual Reactor Trip Due to Multiple Dropped Control Rods Caused by Loss of Control Rod Power Due to Personnel Error (Section 4OA3)

05000247/2003003-04

URI

Electrical Calculation Reconstitution to  
Support Off-Site Power Design Basis (SAT  
Load Tap Changer) (Section 4OA5)

## LIST OF DOCUMENTS REVIEWED

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

#### Procedures

OAP-008, "Severe Weather Preparations," Revision 1  
ARP-013, "High Room Temp. Control BLDG El. 15ft," Revision 33  
2-ARP-SJF 4-1, "480V SWGR Temperature Hi," Revision 35

#### Calculations

GMH-00033-00, "Indian Point 480V Switchgear Room Ventilation in the Event Some Fire Dampers Are Shut or In Closed Position"

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

#### Condition Reports

IP2-2005-02870	IP2-2005-03534	IP2-2006-03096
IP2-2005-02884	IP2-2005-03984	IP2-2006-03122
IP2-2005-02886	IP2-2005-04901	IP2-2006-03674
IP2-2005-02887	IP2-2005-04941	IP2-2006-03837
IP2-2005-03340		

#### Procedures

2-COL-27.3.1, "Diesel Generators," Revision 25  
2-PT-M021A, "Emergency Diesel Generator 21 Load Test," Revision 14  
2-SOP-27.3.1.1, "21 Emergency Diesel Generator Manual Operation," Revision 13  
2-SOP-27.3.1.3, "23 Emergency Diesel Generator Manual Operation," Revision 13  
2-COL-10.1.1, "Safety Injection System," Revision 25  
2-COL- 4.1.1, "Component Cooling System," Revision 21

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

#### Condition Reports

IP2-2006-01402  
IP2-2006-02842

#### Miscellaneous

IP2-RPT-03-00015, "IP2 Fire Hazards Analysis," Revision 9

"IP2 Fire Protection Program Description and Safe Shutdown Analysis," Revision 9

**Section 1R06: Flood Protection Measures**

Condition Reports

IP2-2006-02256  
IP2-2006-04525

Procedures

2-AOP-Flood-1, "Flooding," Revision 0

Miscellaneous

UFSAR Section 2.5, "Hydrology," Revision 17  
IPEC Emergency Action Levels

**Section 1R07: Heat Sink Performance**

Condition Reports

IP2-2006-05235

Calculations

Indian Point Unit 2 Fan Cooler Unit Performance Service Water Inlet Temperature of 95 °F,  
PMXR-8901

Eddy Current Test Reports

PD04312.07, "ITI Record of Eddy current Inspection of Fan Cooler Unit 22 and 24 at Indian Point Unit 2," May 2000  
PD04392, "ITI Record of Eddy Current Inspection of Fan Cooler Unit 25 at Indian Point Unit 2," May 2000  
PD04504.06, "ITI Record of Eddy current Inspection of Fan Cooler Unit 23 at Indian Point Unit 2," November 2002  
PD04504.05, "ITI Record of Eddy current Inspection of Fan Cooler Unit 21 at Indian Point Unit 2," November 2002

Procedures

EN-OP-104, "Operability Determinations," Revision 1  
2-PT-Q016, "Containment Fan Cooler Unit Cooling Water Flow Test," Revision 0, completed 7/25/06  
2-PT-Q016, "Containment Fan Cooler Unit Cooling Water Flow Test," Revision 0, completed 5/20/06  
2-PT-Q016, "Containment Fan Cooler Unit Cooling Water Flow Test," Revision 0, completed 2/6/06

2-PT-Q016, "Containment Fan Cooler Unit Cooling Water Flow Test," Revision 0, completed 11/13/05

ENN-DC-126, "CN-CRA-03-14, Indian Point Unit 2 (IPP) RCFC (Fan Cooler) Performance for LOCA Containment Integrity and PCT," Revision 1

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

#### Procedures

IP-SMM-TQ-114, "Continuing Training and Regualification Examination for Licensed Personnel," Revision 4

0-TQ-SM-104, "Simulator Performance Test Program," Revision 0

IP-EP-210, "Central Control Room," Revision 4

IP-EP-120, "Emergency Classification," Revision 2

SES-E-3-LOOP, "SGTLR, FRV Controller Failure, SGTR with Loss of Offsite Power"

#### Simulator Test Documentation

2006 Simulator Load Schedule

A MANTG White Paper - Simulator Core Testing Criteria

Specific Example of Procedure for Replication of Core Testing - White Paper - Callaway Plant, 9/9/03

A Westrain White Paper, Simulator Reactor Core Performance Testing

IPEC Simulator Performance Test Guide - Core Performance Test, Revision 0 (Draft)

#### Lesson Plans

SES-ECA-0.0b, "SGTL, Loss of Feedwater, Loss of All AC, E-0, ES-1.1," Revision 2

SES-ECA-1.2, "Load Reduction, Misaligned Rod, MSL Rupture, LOCA Outside Containment," Revision 2

LOR052FRH, "Response to Loss of MBFP Control/ Loss of Heat Sink," Revision 0

EOP-C-044, "FR-H.1, Response to Loss of Secondary Heat Sink," Revision 7

SES-FR-S.1-E2, "Loss of CCW, Steam Break in Turbine Building, ATWS, Failure of All MSIV's to Close, Loss of Offsite Power," Revision 2

SES-ECA-00.a, "PT-412A Fails Low, Loss of 138 kV, Main Generator Trip, Loss of All AC Power," Revision 2

SES-ES-13, "HDTP trip, TBHX Leak, LOCA, Recirc W/RHR Pumps," Revision 2

SES-ECA-3.3, "Feed Regulating Valve Fails Closed, SGTR w/o Pressure Control," Revision 2

Job Performance Measures (JPMs)

- 0590131601 - Perform the Required Actions for #23 S/G Controlling Feed Flow Channel (438A) Failing Low, 2/28/06
- 3000111601 - Perform E-0, Attachment 1, with Phase A Not Actuated, 2/28/06
- 0610031601 - Perform the Required Actions to Start 21 ABFP from the CCR with the Recirc Valve Initially in Close Position, 3/2/06
- 0820050201 - Perform the Required Actions to Place the 1KVA TOPAZ Inverter in Service, 2/28/06
- 0390031601, Perform the Required Actions for #22 S/G Controlling Steam Flow Channel (429B) Failing High, 2/28/06
- 3000111602, Perform the Required Actions to Align the Safety Injection System for Transfer to Hot Leg Recirculation, 2/28/06
- 3000021602, Perform the Required Actions to Establish AFW Flow during a Response to Loss of All AC Power, 2/28/06
- 0630151604, Perform the Required Actions to Startup 21 Static Inverter, 3/1/06
- 0840221602, Perform the Required Actions for a Fire in the VC Electrical Penetration Area, Outer Annulus - 46 ft. (Zone 75A) with the Control Room Inaccessible - Nuclear Side Actions, 3/1/06
- 0840061602, Perform the Required Actions to Establish Backup Cooling to the Charging Pumps, 3/1/06
- 0590081604, Perform the Required Actions to Replace 21 Feedwater Regulating Bypass Valve Air Lines for Local Operation during a Loss of Secondary Heat Sink, 2/28/06
- 3000081601, Perform E-0, Attachment 1, with NO SI Pumps Operating and 21 and 23 SI Pump Not Available, 2/28/06
- 3000311601, Perform the Required Actions to Control Feed Flow to Minimize RCS Cooldown during an Uncontrolled Cooldown of All Steam Generators, 2/28/06
- 3001881601, Perform the Required Actions to Isolate SI Accumulators during an LOCA with Failure of MOV-894B to Isolate, 3/1/06
- 0390381601, Perform the Required Actions for #23 SG Steam Pressure Channel (439B) Failing High, 2/28/06
- 0840011601-1, Perform the Required Actions to Evacuate the Control Room, 1/16/06

Miscellaneous

- LRQ Sample Plan for 2006 Annual Operating Exam
- Simulator-Plant Differences Cycle 064, Load 0601 - 7/2/06
- Team 2C AOE Scenario Lineups
- Team 2B AOE Scenario Lineups
- IPEC Operations Shift Order - August 9, 2006, Reporting Requirements as Part of License Conditions - Taking Medication or Stop Taking Medication (p.7 of 7)
- Important Human Actions Training - Top 10 Operator Actions (including local operator actions)
- Entergy Memo - Clarification of Notification to the NRC of Changes in Licensed Operator Medical Conditions

Simulator Deficiency Reports

200500201	200500393	200600047
200500278	200500436	200600112
200500329	200500457	200600246

200600264  
200600265

200600277  
200500441

200600078  
200500187

**Section 1R12: Maintenance Effectiveness**

Condition Reports

IP2-2004-04217  
IP2-2004-06481  
IP2-2004-06539  
IP2-2004-06541  
IP2-2004-06584  
IP2-2005-00798  
IP2-2005-00844

IP2-2005-01140  
IP2-2005-04933  
IP2-2005-01616  
IP2-2006-00666  
IP2-2005-03351

IP2-2005-01872  
IP2-2006-01512  
IP2-2006-04133  
IP2-2006-04134  
IP2-2005-05338  
IP2-2005-02252

Drawings

9321-F-2017, "Flow Diagram - Main Steam," Revision 83

Miscellaneous

2005 Annual System Health Report for Indian Point 2 Main Steam System  
IP2-MS DBD, "Main Steam System," Revision 1  
Indian Point Nuclear Station Unit 2, Maintenance Rule Basis Document for the Main Steam System, Revision 2  
2005 Annual System Health Report for Indian Point 2 345kV System  
Indian Point Nuclear Station Unit 2, Maintenance Rule Basis Document for the 345 kVAC System, Revision 2  
Report #70339 - DOBLE Laboratory test Report 21 and 22 Main Transformer Dissolved Gas Analysis, August 16, 2006  
Units 2 and 3 Maintenance Rule Basis Document - 118 VAC Instrument Bus System, Revision 0  
System Health Report - Fourth Quarter 2005 - Unit 2 118 VAC Instrument Bus

Procedures

2-PT-Q013, Data Sheets 248 to 251, "Inservice Valve Tests," Revision 35  
2-PT-V24E, "Main Steam Isolation Valves," Revision 10  
2-PT-W020, "Electrical Verification - Inverters and DC Distribution in Modes 1 To 4," Revision 0  
2-SOP-27.1.6, "Instrument Bus, DC Distribution System and PA System Inverter," Revision 37  
UFSAR 8.2.2.5, "118 - VAC Instrument Bus"

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

Condition Reports

IP2-2001-00799                      IP2-2006-05300  
IP2-2003-01416                      IP2-2006-05081

Drawings

D260429, "Loop Diagram Reactor Coolant System Temperature - Tavg Alarms Loop Number: 412," Revision 4

Procedures

EN-MA-125, Attachment 9.3, "Troubleshooting Control Form," Revision 2  
IC-PCI-T-412H/J, "Condenser Steam Dump Temperature Mode Control," Revision 7  
IP-SMM-WM-101, On-Line Risk Assessment," Revision 4  
IP-SMM-OP-104, "Offsite Power Continuous Monitoring and Notification," Revision 4

Work Orders

IP2-02-62148                      IP2-06-01431                      IP3-05-13227  
IP2-06-27628                      IP3-05-13225                      IP2-03-04836

Miscellaneous

Operators Risk Report, 8/8/06

**Section 1R15: Operability Evaluations**

Calculations

IP-CALC-04-1760, "Minimum Wall Thickness for 4" Line 413 and 414 Pipe Downstream of 6"x4" Reduced Elbow," Revisions 3 and 4  
FPX-00063-00, "Replacement of EDG Air Start Motors," Revision 0

Condition Reports

IP2-2006-04581                      IP2-2004-06167                      IP2-2006-05241  
IP2-2004-06776                      IP2-2006-04402

Miscellaneous

NL-06-066, "Entergy Letter to NRC Regarding Report on Inoperable Post-Accident Monitoring Instrument LT-940," June 25, 2006  
NL-06-070, "Report on Inoperable Post-Accident Monitoring Instrument LT-940," June 22, 2006

NL-79-A91, "TMI-2 Lessons Learned Task Force Recommendations Details and Methods of Implementation," December 1979  
NL-85-0204, "Evaluation of Regulatory Guide 1.97, Revision 2, 'Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident' In Accordance with NUREG-0737, Supplement 1," August 1985  
PQE-18.1, Environmental Qualification of Radiation Detector Model 875, Revision 0  
PQE-35.1, Environmental Qualification of Rosemont Pressure Transmitter Part Numbers 1154DP7RB, 1154GP9RH, 1154HP5RJ, 1154HP6RJ  
PQE-51.1, Environmental Qualification of Liquid Level Transmitter Model 8-66M, Revision 0  
RA-90-189, "Conformance to Regulatory Guide 1.97, Revision 2," September 27, 1990  
2-PT-Q034, "22 Auxiliary Feed Pump," Revision 21

Drawings

TPD660, "Performance of SS810 and SS815 Starters"  
9321-H-2029, "Flow Diagram Starting Air To Diesel Generators," Revision 49

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

Condition Reports

IP2-2006-04134	IP2-2006-05053	IP2-2006-04885
IP2-2006-04902	IP2-2006-04884	IP2-2006-04341

Drawings

B206658, "Inservice Inspection Isometric of Main Steam Line #2 Outside Containment," Revision 7  
B235623, "Atmospheric Steam Dump Valve Panel," Revision 6  
D252855, "Atmospheric Steam Dump Control (SG #21) Loop Number 1134," Revision 2  
9321-F-2735, "Safety Injection System, Sheet 1," Revision 136

Miscellaneous

IP2-AFW DBD, "Auxiliary Feedwater System," Revision 1

Procedures

2-SOP-31.3.2, "Gas Turbine 3 Local Operations," Revision 17  
2-PC-EM8, "Auxiliary Feedwater Flow Instruments," Revision 9  
2-PC-EM11-1, "No. 21 AFP Run-Out Protection Instruments," Revision 6  
2-PT-Q13, Data Sheet 248, "Inservice Valve Test Data Sheet," Revision 22  
2-PT-Q27, 21 Auxiliary Feed Pump," Revision 15  
E-0, "Reactor Trip or Safety Injection," Revision 47  
E-0 BG, "Reactor Trip or Safety Injection Background Document," Revision 46  
PT-M38C, "Gas Turbine Number 3 PMT," Revision 4  
2-PT-Q030C, "23 Component Cooling Water Pump," Revision 13  
2-PT-Q029B, "22 Safety Injection Pump," Revision 15

2-PT-Q013, "Inservice Valve Tests," Revision 38  
0-VLV-413-MOV, "Motor Operated Valve Minor Preventive Maintenance," Revision 1

Work Orders

IP2-2004-28932	IP2-2006-25152	IP2-2004-13865
IP2-2006-00954	IP2-2003-29000	IP2-2004-30457

**Section 1R22: Surveillance Testing**

Procedures

PT-MT55, "Fire Door Surveillance," Revision 12  
PT-M38C, "Gas Turbine No. 3," Revision 4  
2-SOP-31.3.2, "Gas Turbine 3 Local Operations," Revision 15  
2-PT-M021A, "Emergency Diesel Generator 21 Load Test," Revision 15  
2-PT-2M2A, "RPS Logic Train 'A' Actuation Logic and TADOT (> 25% Reactor Power),"  
Revision 0  
2-PT-Q030B, "21 Component Cooling Water Pump," Revision 13  
2-PT-M7, "Analog Rod Position Functional," Revision 27  
2-SOP-27.3.1.1, "21 Emergency Diesel Generator Manual Operation," Revision 13

Work Orders

IP2-2004-17510

Condition Reports

IP2-2006-04792  
IP2-2006-04800

**Section 1R23: Temporary Modifications**

Procedures

ENN-DC-136, "Temporary Alterations," Revision 8  
2-SOP-28.22, "Loss of RCS Subcooling Monitors," Revision 0  
2-SOP-24.1.2, "Service Water Header Operation," Revision 8

Drawings

A200600, "Diesel Generator Building Cooling Water Piping River Water System," Revision 0

**Section 40A1: Performance Indicator Verification**

Condition Reports

IP2-2004-01211	IP2-2005-00816	IP2-2005-05255
IP2-2004-04334	IP2-2005-00887	IP2-2005-05256

Procedures

EN-LI-114, "Performance Indicator Process," Revision 1

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

Calculations

IP-CALC-06-00164, "Evaluation for Pipe Repair on SW Line 405," Revision 0

Condition Reports

IP2-2006-01883	IP2-2006-02133	IP2-2006-03094
IP2-2006-00173	IP2-2006-02198	IP2-2006-02156

Engineering Requests

IP2-06-18324, "24 Inch Service Water Line 405 Repair," April 28, 2006

Procedures

EN-DC-185, "Through-Wall Leaks in ASME Section XI Class 3 Moderate Energy Piping Systems," Revision 0

Ultrasonic and Magnetic Particle Examination Reports

06UT178	06UT115	06UT132
06UT073	06UT125	06UT072
06UT106	06UT126	06S102
06UT107	06UT127	06S115
06UT111	06UT129	06S118

Program Documents

SEP-SW-001, "Generic Letter 89-13 Service Water Program," Revision 0

System Health Reports

Unit 2 Service Water System, 2nd Quarter 2006  
Unit 2 Service Water System, 1st Quarter 2006

Unit 2 Service Water System, 4th Quarter 2005  
Unit 2 Service Water System, 3rd Quarter 2005  
Unit 2 Service Water System, 1st and 2nd Quarters 2005

**Section 4OA3: Event Followup**

Condition Reports

IP2-2006-01012  
IP2-2006-05065  
IP2-2004-05026

Drawings

D262678, "Loop Diagram HD," Revision 2

Procedures

0-SYS-014-GEN, "Scaffolding Construction and Control," Revision 4  
2-AOP-FW-1, "Loss of Main Feedwater," Revision 7  
ARP 3-9, "Approaching Rod Insertion Limit 12.5 inches"  
ARP 4-6, "Tave Tref Deviation 5 deg F"

Miscellaneous

IP3LO-2006-00094, IPEC Ongoing Self-Assessment Report, "Plant Transient Preparation and Performance: Reactor Trip on March 1, 2006"  
Post Trip Review for Unit 2 Manual Trip on 8/23/06

**Section 4OA5: Other Activities**

Calculations

FEX-00143-01, "IP2 Load Flow Analysis of the Electrical Distribution System," Revision 1  
SGX-00073-01, "Bus Transfer (Transient) Analysis of the IP2 Electrical Distribution System,"  
Revision 1

Condition Reports

IP2-2002-07918

**LIST OF ACRONYMS**

ADAMS	agency wide document and management system
ANS	alert and notification system
CAP	corrective action program
CFR	Code Of Federal Regulations
CR	condition report
DBD	design basis document
EDG	emergency diesel generator
EOF	emergency operations facility
EOP	emergency operating procedure
JPMs	job performance measures
IMC	inspection manual chapter
IPEC	
IPE	individual plant examination
LER	Licensee Event Report
LOCA	loss of coolant accident
MSL	main steam line
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
OP	operating procedure
PI&R	problem identification and resolution
RHR	residual heat removal
RIL	research information letter
RO	reactor operator
SDP	significance determination process
SRO	senior reactor operator
SSC	structure, system, and component
ST	surveillance test procedure
UFSAR	Updated Final Safety Evaluation Report
WO	work order