



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

August 12, 2009

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

**SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT 2 – NRC INTEGRATED
INSPECTION REPORT 05000247/2009003**

Dear Mr. Pollock:

On June 30, 2009, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Indian Point Nuclear Generating Unit 2. The enclosed integrated inspection report documents the inspection results, which were discussed on July 22, 2009, with you and other members of your staff.

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

This report documents one self-revealing finding of very low safety significance (Green). Additionally, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. However, because of its very low safety significance and because it is entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV, 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 Resident Inspector at Indian Point Nuclear Generating Unit 2. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region 1, and the NRC Resident Inspector at Indian Point Nuclear Generating Unit 2. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with Title 10 of the Code of Federal Regulations Part 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS).

ADAMS is accessible from the NRC Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Mel Gray, Chief
Projects Branch 2
Division of Reactor Projects

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

Enclosure: Inspection Report No. 05000247/2009003
w/ Attachment: Supplemental Information

cc w/encl:

Senior Vice President, Entergy Nuclear Operations
Vice President, Operations, Entergy Nuclear Operations
Vice President, Oversight, Entergy Nuclear Operations
Senior Manager, Nuclear Safety and Licensing, Entergy Nuclear Operations
Senior Vice President and COO, Entergy Nuclear Operations
Assistant General Counsel, Entergy Nuclear Operations
Manager, Licensing, Entergy Nuclear Operations
C. Donaldson, Esquire, Assistant Attorney General, New York Department of Law
A. Donahue, Mayor, Village of Buchanan
J. G. Testa, Mayor, City of Peekskill
R. Albanese, Four County Coordinator
S. Lousteau, Treasury Department, Entergy Services, Inc.
Chairman, Standing Committee on Energy, NYS Assembly
Chairman, Standing Committee on Environmental Conservation, NYS Assembly
Chairman, Committee on Corporations, Authorities, and Commissions
M. Slobodien, Director, Emergency Planning
P. Eddy, NYS Department of Public Service
Assemblywoman Sandra Galef, NYS Assembly
T. Seckerson, County Clerk, Westchester County Board of Legislators
A. Spano, Westchester County Executive
R. Bondi, Putnam County Executive
C. Vanderhoef, Rockland County Executive
E. A. Diana, Orange County Executive
T. Judson, Central NY Citizens Awareness Network
M. Elie, Citizens Awareness Network
Public Citizen's Critical Mass Energy Project
M. Mariotte, Nuclear Information & Resources Service
F. Zalzman, Pace Law School, Energy Project
L. Puglisi, Supervisor, Town of Cortlandt
Congressman John Hall
Congresswoman Nita Lowey

Senator Kirsten E. Gillibrand
Senator Charles Schumer
G. Shapiro, Senator Gillibrand 's Staff
J. Riccio, Greenpeace
P. Musegaas, Riverkeeper, Inc.
M. Kaplowitz, Chairman of County Environment & Health Committee
A. Reynolds, Environmental Advocates
D. Katz, Executive Director, Citizens Awareness Network
K. Coplan, Pace Environmental Litigation Clinic
M. Jacobs, IPSEC
W. Little, Associate Attorney, NYSDEC
M. J. Greene, Clearwater, Inc.
R. Christman, Manager Training and Development
J. Spath, New York State Energy Research, SLO Designee
F. Murray, President & CEO, New York State Energy Research
A. J. Kremer, New York Affordable Reliable Electricity Alliance (NY AREA)

J. Pollock

4

ADAMS is accessible from the NRC Web Site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Mel Gray, Chief
Projects Branch 2
Division of Reactor Projects

Docket No. 50-286
License No. DPR-64

Enclosure: Inspection Report No. 05000286/2009003
w/ Attachment: Supplemental Information

Distribution w/encl: (via E-mail)

S. Collins, RA
M. Dapas, DRA
D. Lew, DRP
J. Clifford, DRP
L. Trocine, RI OEDO
R. Nelson, NRR
N. Salgado, NRR
M. Kowal, NRR
J. Boska, PM, NRR

J. Hughey, NRR
M. Gray, DRP
B. Bickett, DRP
S. McCarver, DRP
P. Cataldo, SRI, IP3
D. Hochmuth, DRP
D. Bearde, DRP
ROPReportsResources@nrc.gov
RI Docket Room (with concurrences)

SUNSI Review Complete: __bab__(Reviewer's Initial)

DOCUMENT NAME: G:\DRP\BRANCH2\A - Indian Point 2\Inspection Reports\IP2 IR2009-003\IP2 2009.003. r2.doc

After declaring this document "An Official Agency Record" it **will** be released to the Public

To Receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

ML0922240592

| | | | | | | |
|--------|-----------------|--|--------------|--|-----------|--|
| Office | RI/DRP | | RI/DRP | | RI/DRP | |
| Name | GMalone/bab for | | BBickett/bab | | MGray/mxg | |
| Date | 07/31/09 | | 08/05/09 | | 08/12/09 | |

OFFICAL AGENCY RECORD

U.S. Nuclear Regulatory Commission

Region I

Docket No.: 50-247

License No.: DPR-26

Report No.: 05000247/2009003

Licensee: Entergy Nuclear Northeast (Entergy)

Facility: Indian Point Nuclear Generating Unit 2

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

Dates: April 1, 2009 through June 30, 2009

Inspectors: G. Malone, Senior Resident Inspector - Indian Point 2
C. Hott, Resident Inspector - Indian Point 2
D. Johnson, Physical Security Inspector
J. Noggle, Senior Health Physicist
S. McCarver, Project Engineer
E. Huang, Reactor Inspector
O. Ayegbusi, Reactor Inspector

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

Enclosure

TABLE OF CONTENTS

| | |
|---|-----|
| SUMMARY OF FINDINGS | 3 |
| REPORT DETAILS..... | 4 |
| 1. REACTOR SAFETY | 4 |
| 1R01 Adverse Weather Protection..... | 4 |
| 1R04 Equipment Alignment | 5 |
| 1R05 Fire Protection..... | 6 |
| 1R06 Flood Protection Measures..... | 7 |
| 1R11 Licensed Operator Requalification Program | 7 |
| 1R12 Maintenance Effectiveness..... | 8 |
| 1R13 Maintenance Risk Assessments and Emergent Work Control | 8 |
| 1R15 Operability Evaluations..... | 9 |
| 1R18 Plant Modifications | 10 |
| 1R19 Post-Maintenance Testing..... | 10 |
| 1R22 Surveillance Testing..... | 11 |
| 2. RADIATION SAFETY | 11 |
| 4. OTHER ACTIVITIES | 13 |
| 4OA1 Performance Indicator Verification..... | 13 |
| 4OA2 Identification and Resolution of Problems..... | 13 |
| 4OA3 Event Follow-Up..... | 21 |
| 4OA5 Other Activities..... | 25 |
| 4OA6 Meetings..... | 25 |
| 4OA7 Licensee-Identified Violations | 25 |
| ATTACHMENT: SUPPLEMENTAL INFORMATION | A-1 |
| KEY POINTS OF CONTACT | A-1 |
| LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED..... | A-1 |
| LIST OF DOCUMENTS REVIEWED | A-1 |
| LIST OF ACRONYMS | A-9 |

SUMMARY OF FINDINGS

IR 05000247/2009003; 04/01/2009 – 06/30/2009; Indian Point Nuclear Generating (Indian Point) Unit 2; Event Follow-up.

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

Cornerstone: Mitigating Systems

- Green. The inspectors documented a self-revealing finding of very low safety significance because Entergy engineers did not provide adequate guidance in a design change package for installation of tubing in the 21 main boiler feedwater pump (MBFP) control system that eventually led to the tubing failure and an unplanned trip of the reactor plant. Entergy's design change procedure required that instructions delineating installation precautions be provided in the design change package. Entergy's corrective actions included repairing the affected tubing, identifying and replacing similar tubing on the 22 MBFP, and examining Unit 3 MBFPs to identify the extent of the condition. Entergy staff placed this issue into the corrective action program and performed a root cause analysis.

The finding was more than minor because it was associated with the design control attribute of the Initiating Events cornerstone and affected its objective to limit the likelihood of events that affect plant stability and challenge critical safety functions during shutdown, as well as power operations. Specifically, the incorrectly installed MBFP control tubing resulted in a loss of the 21 MBFP and, ultimately, a reactor trip due to low steam generator water level. The inspectors determined that the finding was of very low safety significance (Green) using the Phase 2 Indian Point Unit 2 risk-informed inspection notebook, in accordance with IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations."

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, and procedures have since been improved in the design control, work control and vendor control processes that reduced the likelihood of vendors working on equipment without sufficient training or work instructions. (Section 40A3)

Other Findings

- A violation of very low safety significance was identified by Entergy staff and has been reviewed by the inspectors. Corrective actions taken or planned by Entergy staff have been entered into Entergy's corrective action program. The violation and corrective action tracking number is listed in Section 40A7 of this report.

REPORT DETAILS

Summary of Plant Status

Indian Point Unit 2 began the inspection period operating at full reactor power (100%). On April 3, 2009, Entergy operators manually shut down Unit 2 because of lowering water levels in the steam generators caused by the trip of a main boiler feed pump. Following investigation and repairs, operators initiated reactor start-up and the plant reached full power operation on April 5, 2009. The reactor trip and associated equipment issues are described further in Section 4OA3. 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 - 3 samples).1 Summer Readiness of Offsite and Alternate AC Power Systemsa. Inspection Scope

The inspectors verified that plant features and procedures for operation and continued availability of offsite and alternate AC power systems were appropriate. Specifically, the inspectors reviewed station procedures that describe roles, responsibilities, and actions related to the control of switching operations, emergency operations, and degraded conditions on the 13.8kV, 138kV, and 345kV electric power distribution system in the Buchanan Switchyard and onsite at Indian Point. Additionally, the inspectors walked down portions of the Buchanan Switchyard, onsite high voltage components, and the Appendix R diesel generator. The inspectors reviewed outstanding maintenance work orders and condition reports (CRs) related to these systems to verify Entergy personnel were appropriately prioritizing work and correcting problems in accordance with station procedures. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 Station Readiness for Summer Heat Conditionsa. Inspection Scope

The inspectors reviewed the readiness of risk-significant systems for summer hot weather conditions. The inspectors reviewed Entergy's adverse weather procedures, operating experience, corrective action program, Updated Final Safety Analysis Report (UFSAR), Technical Specifications (TS), operating procedures, staffing, and applicable plant documents to determine the types of adverse weather challenges to which the site is susceptible. The inspectors also checked local area temperatures, as well as the operability of ventilation and air conditioning cooling systems, to ensure the plant was prepared for warm weather conditions. In addition, the following risk-significant systems that were required to be protected from adverse weather conditions were selected and collectively represented one inspection sample:

- Main steam isolation system;
- 480-Volt system; and
- Appendix R emergency diesel generator system.

b. Findings

No findings of significance were identified.

.3 Emergent Heat Conditions on April 27-28, 2009

a. Inspection Scope

The inspectors evaluated implementation of the adverse weather preparation procedures and compensatory measures before the onset of, and during adverse weather conditions. Specifically, the inspectors evaluated Entergy's preparations and compensatory measures taken during a period of hot weather from April 27 to April 28, 2009. The inspectors conducted walkdowns of plant equipment and reviewed operating procedures to ensure that equipment important to safety would not be adversely affected by severe weather conditions. The documents reviewed during this inspection are listed in the Attachment. This inspection satisfied one inspection sample for the onset of adverse weather.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment (71111.04Q - 3 samples)

.1 Partial System Walkdowns

a. Inspection Scope

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

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

- 21 and 23 component cooling water pumps during maintenance on the 22 component cooling water pump;
- 22 containment spray pump system train when the 21 containment spray pump was tagged out for maintenance; and
- 21 charging pump during repairs to the 23 charging pump.

b. Findings

No findings of significance were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

The inspectors performed a complete system walkdown of accessible portions of the non-essential service water system to identify discrepancies between the existing equipment lineup and the required lineup. The inspectors reviewed operating procedures, surveillance tests, piping and instrumentation drawings, equipment lineup check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors reviewed a sample of CRs written to address deficiencies associated with the system to ensure they were appropriately evaluated and resolved. The documents reviewed during this inspection are listed in the Attachment. The walkdown of the non-essential service water system represented one inspection sample.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 7 samples)

a. Inspection Scope

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

- Fire Zone 5, 21 charging pump room;
- Fire Zone 6, 22 charging pump room;
- Fire Zone 7, 23 charging pump room;
- Fire Zone 1A, containment piping penetration room;
- Fire Zone 1, component cooling pump room;
- Fire Zone 11, cable spreading room; and
- Fire Zone 66A, service water valve and strainer pit.

b. Findings

No findings of significance were identified.

.2 Annual Fire Drill Sample

a. Inspection Scope

The inspectors observed the fire brigade's response to an actual fire alarm on May 18, 2009. The fire brigade was dispatched to a manhole inside the protected area containing 138kV offsite power cables used to allow power to be cross-connected between Unit 2 and Unit 3 138kV switchyards. The inspectors verified the fire brigade responded to the call in a timely manner, protective clothing and turnout gear was properly worn, appropriate fire fighting equipment was selected and made ready for use, and the fire brigade leader exhibited command-and-control of the scene.

b. Findings

No findings of significance were identified. The heat and smoke identified in the manhole were due to an electrical fault in the three-phase non-safety related power cables in the vault. Protection relays in the electrical system automatically isolated the fault from the rest of the 138kV switchyard following the fault. There was no other equipment in the manhole and no extinguishing material was required to be discharged.

1R06 Flood Protection Measures (71111.06 - 1 sample)

a. Inspection Scope

The inspectors completed one internal flood protection sample. The inspectors reviewed selected risk-important plant design features and Entergy procedures intended to protect the plant and its safety-related equipment from internal flooding events. The inspectors focused on mitigation strategies and equipment for the 15' elevation of the auxiliary feed pump building, including the 21, 22, and 23 auxiliary boiler feed pump areas. The inspectors reviewed flood analysis and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures. The inspectors observed the condition of wall penetrations, watertight doors, flood alarm switches, and drains to assess their readiness to contain flow from an internal flood in accordance with the design basis.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Regualification Program

.1 Quarterly Review (71111.11Q – 1 sample)

a. Inspection Scope

On June 10, 2009, the inspectors observed licensed operator simulator training, which included an anticipated transient without a scram and a loss of primary coolant scenario, to verify operator performance was adequate and 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, implementation of actions in response to alarms, performance of timely control board operation and manipulation, and the

oversight and direction provided by the control room supervisor. The inspectors also assessed simulator fidelity with respect to the actual plant. The inspectors evaluated licensed operator training for conformance with the requirements of 10 CFR Part 55, "Operator Licenses." The documents reviewed during this inspection are listed in the Attachment. This observation of operator simulator training represented one inspection sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q - 2 samples)

a. Inspection Scope

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

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

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

- Primary water make-up system; and
- 22 service water pump bearing failures.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 9 samples)

a. Inspection Scope

The inspectors reviewed scheduled and emergent maintenance activities to verify that the appropriate risk assessments were performed prior to removing equipment from service for maintenance or repair. The inspectors reviewed selected risk assessments to verify assessments were performed as required by 10 CFR 50.65(a)(4), and were accurate and complete. When emergent work was performed, the inspectors reviewed the plant risk to ensure risk was promptly reassessed and managed. Documents reviewed during this

inspection are listed in the Attachment. The following activities represented nine inspection samples:

- Planned maintenance on residual heat removal system valve during safety injection system venting;
- Steam generator steam flow testing during emergent work on a turbine hall cooling pump and 23 control rod drive mechanism fan;
- Planned maintenance on 22 auxiliary boiler feed pump during undervoltage relay replacement;
- Planned maintenance on 96951 138kV feeder line during 21 safety injection pump and valve testing;
- Planned maintenance on 21 primary water pump, 22 service water pump, 22 component cooling water pump, and the 96952 138kV feeder line;
- Planned maintenance activities during the week the 138kV cross-tie feeder line 33332 experienced a fault to ground and remained out of service;
- Emergent work on 22 circulating water pump and 23 containment fan coil unit with the 138kV cross-tie feeder line 33332, 21 primary water pump and valve FCV-110A out of service for maintenance;
- Emergent work activities associated with the 345kV breakers 7 and 11 (line 95891) with the 138kV line 33332 and 21 primary water pump out of service; and
- Emergent work activities associated with the 23 charging pump, 22 stator water cooling pump, and trip of the 23 motor control center.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 7 samples)

.1 Resident Quarterly Review

a. Inspection Scope

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

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

- 22 auxiliary boiler feed pump (ABFP) bearing conditions;
- Main steam isolation valve operability based on high ambient temperatures in the auxiliary feed pump building;
- 22 ABFP steam admission valve leak-by (PCV-1139);
- Residual heat removal pumps oil level deviations;
- Seismic qualification of vital 480V manholes;

- Seismic qualification of service water piping located at the intake structure (missing pipe support); and
- Leak in the 24 service water train discharge piping.

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18 - 3 samples)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed three conditions as temporary plant modifications. The inspectors reviewed Entergy's temporary modification procedure to verify that modifications were processed adequately. The inspectors verified the design bases, licensing bases, and performance capability of the system was not degraded by the temporary modification. In addition, the inspectors interviewed plant staff and reviewed issues entered into the corrective action program to determine whether Entergy had been effective in identifying and resolving problems associated with the temporary modifications. The documents reviewed are listed in the Attachment. The review of these temporary modifications represented three inspection samples. The following modifications were reviewed:

- Diagnostic equipment stationed external to 21 and 22 static inverters to troubleshoot intermittent inverter alarms and power supply swaps;
- Diagnostic equipment attached to a control room panel to troubleshoot intermittent grounds on the 21 battery charger; and
- 21 reactor coolant pump oil fill connection to allow remote filling of bearing reservoirs due to leakage.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 3 samples)

a. Inspection Scope

The inspectors reviewed post-maintenance test procedures and associated testing activities for selected risk-significant mitigating systems, and assessed whether the effect of maintenance on plant systems was adequately addressed by control room and engineering personnel. The inspectors verified that: test acceptance criteria were clear and the test demonstrated operational readiness consistent with design basis documentation; test instrumentation had current calibrations with the appropriate range and accuracy for the application; and the tests were performed as written, with applicable prerequisites satisfied. Upon completion of the tests, the inspectors reviewed whether 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 activities were reviewed and represented three inspection samples:

- Replacement of service water vacuum breaker valve SWN-9;
- Calibration and replacement of undervoltage relays 27-52 and 27-53 on bus 5A; and
- Post-maintenance test associated with the 2-year overhaul of the 28 service water traveling water screen.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 5 samples)

a. Inspection Scope

The inspectors observed performance of portions of surveillance tests and/or reviewed test data for selected risk-significant SSCs to assess whether tests satisfied TS, 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; test instrumentation had accurate calibration, and appropriate range and accuracy for the application; and tests were performed as written, with applicable prerequisites satisfied. Following the tests, the inspectors verified that the equipment was capable of performing the required safety functions. The inspectors evaluated the surveillance tests against the requirements in TS. The documents reviewed during this inspection are listed in the Attachment. The following surveillance tests were reviewed and represented five inspection samples:

- 2-PT-Q38, primary water storage tank level;
- 2-PT-M108, safety injection system venting;
- 2-PT-Q030C, 23 component cooling water pump in-service test;
- 2-PT-Q59, containment pressure bistables; and
- 2-PT-Q029B, 22 safety injection pump.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety (PS)

2PS2 Radioactive Materials Processing and Shipping (71122.02 - 6 samples)

a. Inspection Scope

From June 22 to June 26, 2009, the inspectors conducted the following activities to verify that Entergy's radioactive material processing and transportation programs complied with the requirements of 10 CFR 20, 61, and 71; and Department of Transportation (DOT) regulations 49 CFR 170-189.

- (1) The inspectors reviewed the solid radioactive waste system description in the UFSAR, the 2008 radiological effluent release report for information on the types and amounts of radioactive waste disposed, and the scope of the licensee's audit program to verify that it meets the requirements of 10 CFR 20.1101.

- (2) The inspectors walked-down the liquid and solid radioactive waste processing systems to verify and assess that the current system configuration and operation agree with the descriptions contained in the UFSAR and in the Process Control Program (PCP); and reviewed the status of radioactive waste process equipment that is not operational and/or is abandoned in place; verified changes were reviewed and documented in accordance with 10 CFR 50.59, as appropriate. The inspectors reviewed the current processes for transferring and dewatering of radioactive waste resin and sludge discharges into shipping/disposal containers to determine if appropriate waste stream mixing and/or sampling procedures, and methodology for waste concentration averaging provide representative samples of the waste product for the purposes of waste classification as specified in 10CFR 61.55 for waste disposal.
- (3) The inspectors reviewed the radio-chemical sample analysis results for the licensee's radioactive waste streams, reviewed the licensee's use of scaling factors and calculations with respect to these radioactive waste streams to account for difficult-to-measure radionuclides, verified the licensee's program assures compliance with 10 CFR 61.55 and 10 CFR 61.56 as required by Appendix G of 10 CFR 20, and reviewed Entergy's program to ensure the waste stream composition data accounts for changing operational parameters and thus remains valid between the annual or biennial sample analysis update.
- (4) From June 24 to June 25, 2009, Entergy personnel prepared, packaged, and completed shipment No. 09-109 containing spent filters in a Type A cask for shipment to a waste processor. The inspectors observed the shipment preparations that included: packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifests, shipping papers provided to the driver, and licensee verification of shipment readiness.
- (5) The inspectors sampled the following non-excepted package shipment records and reviewed these records for compliance with NRC and DOT requirements:
- 08-055, spent fuel pool demineralizers shipment to a waste processor on April 7, 2008;
 - 08-093, Hudson River silt shipment to a waste processor on May 15, 2008;
 - 08-170, sodium hydroxide shipment to a waste processor on September 4, 2008;
 - 08-200, Unit 1 debris shipment to a waste processor on November 4, 2008;
 - 08-223, fuel sipping equipment shipment to Westinghouse on December 15, 2008;
 - 09-068, dry active waste shipment to a waste processor on April 15, 2009;
 - 09-100, Unit 1 pool sludge shipment to a waste processor on June 10, 2009;
 - 09-102, Unit 2 primary resin shipment to a waste processor on June 17, 2009;
 - 09-103, Unit 3 bead resin shipment to a waste processor on June 17, 2009;
 - and
 - 09-109, spent filter shipment to a waste processor on June 25, 2009.
- (6) The inspectors reviewed Entergy's Licensee Event Reports, Special Reports, audits, State agency reports, and self-assessments for Indian Point Unit 2 related to the radioactive material and transportation programs performed since the last inspection to determine if identified problems are entered into the corrective action program for

resolution. The inspectors also reviewed corrective action reports written against the radioactive material and shipping programs since the previous inspection.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 3 samples)

a. Inspection Scope

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

Initiating Events Cornerstone

- Unplanned Scrams with Complications

Mitigating Systems Cornerstone

- Safety System Functional Failures; and
- Emergency AC Power System Mitigating Systems Performance Indicator.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152 - 5 samples)

.1 a. Inspection Scope

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

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

b. Findings

No findings of significance were identified.

.2 Annual Sample: Review of Corrective Actions Related to the Installation and Project Management of the New Alert and Notification System (ANS) (71152 – 1 sample)

a. Inspection Scope

The inspectors reviewed Entergy staff's actions in response to CRs generated as a result of issues associated with the installation and project management of the new alert and notification system (ANS) for the Indian Point Energy Center. The inspectors reviewed Entergy procedures on project management and external stakeholder communications. In addition, the inspectors interviewed applicable members of Entergy's staff including a lead project manager and licensing staff. The focus of this inspection was to verify that the corrective actions, reviewed during the December 2008 Enforcement Follow-up Inspection (Inspection Procedure 92702, NRC Inspection Report 50-247/286, 2008-503, dated January 27, 2009), were being completed in a thorough and timely manner.

b. Findings & Observations

No findings of significance were identified. The inspectors reviewed CRs documenting issues related to the installation and project management of the new ANS placed into service for the Indian Point Energy Center in 2008. The inspectors determined Entergy personnel implemented or generated plans for appropriate corrective actions to address each issue that was identified. Additionally, the inspectors verified that Entergy staff appropriately implemented or generated plans for corrective actions to revise the project management process, require greater senior management oversight for projects, and develop a new procedure for interactions with external stakeholders.

.3 Annual Sample: Station Auxiliary Transformer Tap Changer Alarms (71152 – 1 sample)

a. Inspection Scope

The inspectors reviewed Entergy staff's evaluations and corrective actions associated with the station auxiliary transformer tap changer hang-up alarms. Entergy staff's evaluations determined that for the tap changer alarm to occur: the tap changer is either in-between taps and a time delay of 12 seconds has passed; or the tap changer is greater than or equal to 16 taps in the raise or lower direction and a time delay of 12 seconds has passed. The alarm could also occur if there is a problem with the alarm circuitry. The inspectors reviewed Entergy staff's corrective actions to ensure that appropriate evaluations were performed and corrective actions were specified and prioritized. The inspectors also reviewed the follow-up actions to verify that the corrective actions identified were implemented.

b. Findings & Observations

No findings of significance were identified.

The inspectors determined Entergy's corrective action associated with the station auxiliary transformer tap changer hang-up alarms was appropriate. Entergy's corrective actions in 2007 were to examine the alarm circuitry in addition to the scheduled preventive maintenance in the refueling outage of 2008. The inspectors noted that the 2008 preventive maintenance that was performed provided satisfactory results; however, the alarm issue continued to occur following the outage. Entergy personnel currently respond to the alarms by entering the appropriate alarm response procedure and TS 3.8.1 action statement each time the alarm occurs as well as manually verifying that the tap changer remained functional.

Entergy personnel are currently tracking and trending the alarms and plan to adjust the cam rollers of the tap changer in the spring outage of 2010. From the data of the last two alarms, Entergy staff indicated the two cam switches that communicate between the alarm circuit and the motor are not synchronized and an adjustment of the cam rollers should resolve the alarms. The inspectors determined that previous surveillance tests demonstrated the alarm circuitry is operable and the alarm will actuate on a valid signal. The inspectors determined the alarms appear to be an alarm issue only not an actual tap changer performance problem at this time. The inspectors determined the tap changer is able to perform its required function and corrective actions in place by Entergy personnel are adequate and commensurate with the risk significance of the issue.

.4 Annual Sample: Review of Service Water Pump Motor Termination Failure (71152 – 1 sample)

a. Inspection Scope

The inspectors selected CR-IP2-2008-00414 as a problem identification and resolution (PI&R) sample for a detailed follow-up review. CR-IP2-2008-00414 documented a failure of the 21 service water pump (SWP) motor 'B' phase termination that resulted in the pump being declared inoperable on January 24, 2008. Entergy personnel determined the failure was due to the installation of an undersized cable termination lug during the previous replacement of the 21 SWP motor in April 2005. The inspectors assessed Entergy staff's problem identification threshold, apparent cause evaluation, extent of condition review, and the prioritization and timeliness of corrective actions to determine whether personnel were appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate.

b. Findings and Observations

No findings of significance were identified.

The inspectors determined Entergy personnel adequately implemented its corrective action process regarding the initial discovery of the above issue. The CR packages were complete and included an apparent cause evaluation, extent of condition reviews, completed and planned corrective actions. Additionally, the elements of the CR packages were detailed and thorough. Specifically, the inspectors noted Entergy personnel implemented a new procedure for installing electric motor terminations EN-425-TER, "Installation of Electric Motor Terminations." Also, Entergy trainers provided refresher training on performing electric motor terminations to the maintenance department and revised the electricians' lesson plan EMF-EWS-01, "Electrical Workmanship Standards" to include training on electric motor terminations and scheduled the installation of infrared windows on the motor termination box for periodic thermography inspections. In addition, Entergy personnel revised 2-PMP-004-SWS, "IP2 Service Water Pump and Motor Replacement Procedure," to use EN-425-TER for installing electrical motor terminations. As part of the extent of condition, Entergy staff performed detailed visual and thermography inspections of a selection of motor terminations. The inspectors determined the anomalies found during those inspections were adequately addressed.

During the inspection, the inspectors noted that the new procedure, EN-425-TER, was in a reserved status and the CR was closed indicating all corrective actions were completed. Entergy staff overlooked activating EN-425-TER because 2-PMP-004-SWS had not been revised to reference the new procedure for installing electric motor terminations. The

inspectors determined the issue was of minor significance because ENN-EE-S-008-IP had been revised to perform the same function as EN-425-TER and was available for use. Following discussions with the inspectors, Entergy staff activated EN-425-TER and revised 2-PMP-004-SWS accordingly. The inspectors determined the corrective actions were timely and appeared appropriate to resolve the above issue. The inspectors determined these corrective actions addressed immediate equipment concerns as well as the extent of condition of the problem. In addition, the inspectors determined that adequate tracking mechanisms were in place to ensure scheduled corrective actions should be completed.

.5 Annual Sample: Review of Root Cause Analysis and Actions Addressing the Underground Pipe Leak to the Condensate Storage Tank Return Line (71152 – 1 sample)

a. Inspection Scope

The inspectors reviewed Entergy staff's root cause analysis (RCA) for a leak in a section of underground return piping to the condensate storage tank (CST) that was identified on February 15, 2009. The inspectors reviewed the report and pertinent documents and interviewed station personnel to determine if the RCA adequately identified the causes of the leak, considered the extent of the problem, and provided for adequate corrective actions.

Background

On February 15, 2009, at approximately 3:00 p.m., an operator on rounds observed water in the CST return pipe sleeve where the pipe enters the auxiliary feed pump building floor. Entergy staff took chemistry samples of the water and subsequently determined that 54 parts per billion (ppb) hydrazine was present, indicating that the water was likely from the condensate system. At 1:30 a.m. on February 16, operators declared the CST inoperable. By February 18, Entergy staff determined the leak rate from the CST was approximately 17 gallons per minute (gpm), commenced excavation of the probable leak location, and confirmed that the leakage was from the CST return piping. On February 19, the excavation of the CST piping exposed the leak on the CST return pipe. Entergy technicians removed the pipe coating from the surrounding areas and performed ultrasonic testing of the pipe walls and determined the removed pipe was structurally sound and the metal loss was localized to the area of the pipe coating degradation. In addition to the hole identified in the horizontal run of the return pipe, Entergy staff discovered areas of minor metal loss on a pipe elbow in the same line due to pipe coating degradation. Entergy personnel removed the damaged section of piping and elbow and welded a new pipe portion in place on February 20. The CST was declared operable at 6:56 a.m. on February 21.

Entergy staff performed a RCA to determine the causes of the CST pipe leak. Entergy staff also contracted a vendor to analyze the portion of piping that was removed to determine the failure mode mechanisms. During excavation, Entergy staff identified a portion of the pipe backfill contained rocks ranging in size from 3 to 8 inches. Entergy staff reviewed the backfill specifications used during plant construction and determined the specifications did not provide detailed information on what size rocks could be present in this area. Entergy staff determined this particular area had a concrete slab poured on top of the fill and the slab was not intended to be a load bearing surface and, therefore, was not specific in requirements for the type of fill to be used. The vendor analysis of the pipe concluded that the leak was caused by external corrosion in areas where the pipe coating was degraded. Although the exact type of external corrosion could not be definitively concluded, Entergy staff determined the corrosion was likely the result of exposure to a range of ground water characteristics, and/or microbiologically influenced corrosion. Entergy's RCA documented that the large

rocks found in the backfill likely damaged the pipe coating during installation of the pipe and allowed the corrosion mechanisms described above to act on the localized metal surfaces. Entergy staff determined the pipes were found to be in good condition where the coating was intact.

Entergy's root cause team examined the station's capability to track water usage to determine whether it was reasonable for staff to identify the leakage prior to February 15. The root cause team determined that it was not feasible for operators to detect the leakage from main condenser hotwell level indications or CST level indications because the rate of leakage (10-17gpm) was too small to detect considering the tank volumes and installed instrumentation. Furthermore, the root cause team supported its conclusion because several sources contribute to normal losses of inventory in the hotwell and require replenishment from the CST such as steam generator blowdown, non-safety auxiliary steam heating, and typical leakage from the non-safety related condensate system. Additionally, control room operators periodically monitor the decrease in CST level and make-up to the CST as necessary to ensure the CST level is maintained within required limits.

Entergy's root cause team developed a corrective action plan to address the root and contributing causes of the pipe degradation. As part of those corrective actions, Entergy staff identified additional buried pipe inspections at several locations based on similar corrosion susceptibilities. Specifically, the root cause documentation described the Indian Point Buried Piping and Tank Inspection Program that has been under development since 2007, as part of a corporate-wide initiative to develop these programs at all Entergy sites. The program identifies underground pipes at the site and assigns an impact assessment level based on safety impact of a failure. The high impact systems are also corrosion risk assessed by considering soil conditions, pipe material, and existing coatings or cathodic protection. The scheduling of examination of the pipes is determined by the potential safety impact and corrosion risk assessments. The non-destructive examinations may involve the use of guided wave technology, excavation and visual inspection, or other appropriate techniques as determined by Entergy personnel. Entergy managers plan to have the buried piping program fully developed by the end of 2009.

Entergy's corrective action plan included the following actions listed below:

- Update the buried piping backfill and excavation specification;
- Implement improved inspection techniques for buried piping;
- Evaluate the need for cathodic protection systems and draining systems for select buried piping;
- Evaluate the use of existing monitoring wells for buried pipe and tank leaks for early detection capability;
- Conduct non-destructive examinations of the following pipe sections in the near term for investigation:
 - CST return line (2 different locations)
 - CST supply line (2 different locations)
 - Service water line 408 (2 different locations); and
- Remainder of underground piping to be inspected in accordance with Buried Piping Program schedule.

As further background, by letter dated July 27, 2009, as clarified by letter dated August 6, 2009, Entergy management submitted an amendment to their license renewal application which modified the Indian Point Buried Piping and Tanks Inspection Program. This amendment reflected Entergy's operating experience with the CST buried pipe leak at Unit 2

and included identification of additional buried pipe examinations. These non-destructive examinations will be performed by Entergy personnel at Units 2 and 3 prior to entering the period of extended operation and will supplement the six additional inspections referenced above.

b. Findings and Observations

No findings of significance were identified.

Overall, the inspectors reviewed Entergy staff activities related to the CST return line leak and the associated RCA and determined that Entergy's staff identified the likely causes of the leak, considered the extent of the problem, and planned or provided for adequate corrective actions. Additionally, the inspectors concluded that Entergy's root cause team adequately considered prior opportunities for identifying the CST return line leak.

The inspectors independently reviewed plant drawings and the backfill specifications provided by the engineer/architect at the time of plant construction and determined the drawings and specification did not detail or place limits on the type of backfill required and specifically did not prohibit rocks from being used in the backfill.

The inspectors noted that Entergy personnel performed required testing in accordance with the American Society of Mechanical Engineers Boiler & Pressure Vessel (ASME BPV) Code Section XI and 10 CFR 50.55a. ASME Section XI requires pipes similar to the CST return line be tested three times over the 10-year inspection interval by a pressure drop or flow test. The inspectors determined that Entergy had procedures in place to implement ASME Code requirements for testing the subject CST return line piping.

The inspectors considered whether the RCA evaluated the potential for Entergy personnel to identify the pipe leak prior to February 15, 2009. The inspectors concluded that Entergy's RCA adequately considered prior opportunities for Entergy staff to identify the leak and that Entergy staff identified the leak when reasonable to do so. However, the inspectors identified two examples in which the RCA did not consider corrective actions that might aid Entergy staff in the early identification of leaks in the future should they occur.

- Entergy's RCA evaluated Unit 2 CST level losses and condensate flow paths prior to February 2009 with a focus on the operators' ability to identify secondary level changes that would be indicative of a CST leak. The root cause team concluded it would not be reasonable for operators to identify a secondary leak of 10-20 gpm on the Unit 2 CST using the installed instrumentation because the leak was very small compared to the large volume of the CST. While the RCA considered the CST volume and water usage flow paths, the inspectors determined the RCA did not consider or document an evaluation with respect to existing daily operational logs that could provide trend information on overall processed monthly water usage and make-up to the Unit 1 CST. The inspectors' review identified that operations personnel log the processed water sent from the station's on-site city water system to the Unit 1 CST such that the amount of water used daily by secondary plant operations on Unit 2 can be trended. The inspectors' review of water usage identified a noticeable increase in water consumed by Unit 2 in November 2008 with a continued increase through February 2009 compared to typical water usage in prior years during the same months. When interviewed by inspectors, Entergy staff explained the log reading is used to verify station billing from the water conditioning vendor and not intended to be trended and tracked for purposes of Unit 2 CST water usage.

The inspectors determined it was not reasonable for Entergy staff to have identified the CST return pipe leak based on the increased water usage as logged for billing purposes considering there was not a prior history of CST pipe leaks. However, the inspectors' review determined Entergy's RCA did not document its evaluation of the capability to trend logged water usage data from year to year. Additionally, Entergy's RCA did not evaluate whether this water usage data could be useful, in concert with other monitoring activities, to identify indications of potential leaks in the future as early as reasonably possible, whether they occur from safety related or non-safety related components.

- Entergy's RCA reviewed previous inspection results for excavation of two sections of CST piping that were conducted by Entergy staff in October and November 2008 in response to recommendations from an Independent Safety Evaluation Report dated July 31, 2008. The excavated areas were located in areas between the CST and the auxiliary feed pump building. At that time, Entergy staff identified, based on non-destructive examinations, five areas of piping that required coating repair due to missing or damaged pipe coating. The inspectors' review of Entergy's examinations noted that the pipe walls at those locations in 2008 remained at or near their original manufactured thickness. Based on observations and repairs made, Entergy's staff concluded the pipes did not exhibit pipe degradation that would warrant further inspection of these same locations in the future. Additionally, the inspectors noted Entergy's RCA described that during the 2008 excavations, Entergy staff observed water visible in a CST return line pipe collar where the piping entered the auxiliary feed pump building. Entergy staff performed chemistry analysis of this water and concluded, based on the sample results, that the pH, tritium levels, and absence of hydrazine indicated the leakage was consistent with groundwater chemistry during a time of heavy rains and was not indicative of CST water chemistry.

The inspectors concluded Entergy staff adequately assessed conditions surrounding the 2008 excavations. However, the inspectors determined the RCA did not evaluate the water present in the CST return pipe collar in October 2008 specific to the issue not being entered into the corrective action program. The inspectors determined it would have been appropriate for the RCA to evaluate whether corrective actions were appropriate to reinforce the expectations for staff to enter unanticipated visual indications of water in the CST pipe return floor collar within the corrective action program to provide awareness to senior managers and provide an opportunity to trend the condition. The inspectors concluded this issue was a performance deficiency of minor significance based on the actions taken by Entergy staff at that time which included chemistry results that supported Entergy's assessment the water was not indicative of CST water chemistry and tritium levels were well below regulatory limits for release to the environment.

.6 Semi-Annual Trend Review (71152 - 1 sample)

a. Inspection Scope

In July 2009, inspectors reviewed Entergy staff's progress in implementing corrective actions identified in 2008 to address Human Performance issues as outlined in Entergy's Human Performance Improvement Plan with a focus on specific efforts since January 2009. The inspectors evaluated staff performance improvement plans and actions using inspection guidance in Inspection Procedure 71152, "Identification and Resolution of Problems." Specifically, the inspectors assessed Entergy's progress in addressing human performance

by evaluating whether Entergy's internal milestones were being monitored and consistently met and whether adjustments in approach were made when necessary. This inspection focused on the actions implemented since January 2009.

The inspectors conducted a review of the applicable condition reports (CRs), corrective action assignments (CAs), focused self-assessments, Quality Assurance group assessments, and causal evaluations for human performance events and errors. The inspectors also reviewed Entergy internal performance indicators related to their performance improvement plan, and reviewed a sample of revised procedures in order to assess the adequacy of the performance plan and effectiveness of corrective actions.

b. Findings and Observations

No findings of significance were identified.

In late December 2008, NRC inspectors independently reviewed the causal evaluation and corrective actions focused on an emerging trend, identified by Entergy, and associated with human performance errors. Entergy staff and managers identified several events, attributable to human performance errors that occurred at Indian Point (both units) in 2008, which resulted in personal injury and/or equipment failures. The inspectors determined that Entergy managers recognized this adverse trend in human performance, and developed a Human Performance Program to address the causes of the events, and to assist in the prevention or mitigation of future occurrences. The inspectors noted that the Human Performance Program included actions to understand the causes of human performance errors, to reduce these human performance errors in the future, and to monitor future performance.

The inspectors determined Entergy staff and managers developed station-wide communication tools, training plans, and adjusted the site business plan to address these common causes of human performance errors. New communication tools developed included Safety and Human Performance Stand Downs and periodic human performance bulletins. The Safety and Human Performance Stand Downs were used to develop a forum to reinforce site human performance expectations and discuss recent human performance error events. Entergy managers also scheduled future stand downs to coincide with major evolutions on site in 2009, such as the Unit 3 refueling outage.

The inspectors noted that Entergy staff developed a Human Performance Simulator and Work Management Academy to provide training on human performance traps, human performance tools, and to improve work planning and execution. The Human Performance Simulator focuses on reinforcing the proper threshold for identifying error traps and the effective use human performance tools to accomplish tasks. Operations and maintenance departments have completed this training, and it will now be included as annual refresher training for their department personnel. The Work Management Academy was required for all supervisory personnel and reinforced Entergy's work management model and procedures. Entergy staff and managers also developed its Thought Improvement Process (TIP) Initiative to encourage employees to provide constructive feedback to improve the site's human performance.

The inspectors also noted that Entergy staff and managers established commitments to monitor future human performance at Indian Point. In particular, human performance indicators and self-assessment results would be used to monitor the effectiveness of the current programs and for evaluation of future trends in human performance. The inspectors

concluded that Entergy took action to address the site's emerging adverse human performance trend. The programs established within Entergy's Human Performance program were determined to be reasonable to address the recent human performance.

During the July 2009 semi-annual trend review, inspectors determined that Entergy staff continued to make progress in implementing their corrective action plans to address human performance issues related to error prevention and to make adjustments to those actions based on the results of self-assessments, performance indicators, and benchmarking. For example, based on observations of supplemental workers during the recent Unit 3 refueling outage, actions were being developed to provide additional oversight of supplemental workers. The inspectors also noted that, in accordance with previous corrective actions, Entergy staff and managers had:

- Continued to use the Human Performance Simulator to train various departments, and to check and adjust development of dynamic learning activities in the simulator;
- Implemented a standard schedule for site wide stand downs during outage and non-outage periods;
- Revised pre-job briefing procedures to include signature accountability,
- Implemented a task/job observation program aligned with the work control process and Most Error Likely Task-focused crew assessments;
- Assigned experienced mechanics, technicians, and operators to procedure groups;
- Reinforced critical procedure steps through the use of special markings, briefs, and feedback;
- Filled key personnel vacancies previously identified as necessary to strengthen the organization's effectiveness in preventing human error;
- Improved adherence to online and outage work management milestones;
- Improved effectiveness of work package walk downs and feedback;
- Established weekly work package quality meetings.

Additionally, the inspectors noted that Entergy has developed additional performance indicators to assist in monitoring progress in addressing human errors, and is planning to conduct annual Human Performance training to first-line supervisors and above.

The recent trend in human performance related to error prevention indicated that corrective actions, to date, have not resulted in a decrease in the human error rate trend, primarily due to issues that occurred during the Unit 3 refueling outage. Notwithstanding, the inspectors concluded that station management has adjusted its actions/focus as a result of its evaluation of additional performance information, especially from the outage. The programs and actions established within Entergy's Human Performance program were determined to be reasonable to address the recent human performance issues related to error prevention.

4OA3 Event Follow-Up (71153 – 2 samples)

.1 Reactor Trip on April 3, 2009, Due to Low Steam Generator Water Levels

a. Inspection Scope

The inspectors responded to the control room on April 3, 2009, following a manual insertion of all control rods (manual reactor trip) by control room operators due to lowering water levels in all four steam generators (SGs) due to a combination of an unexpected 21 main boiler feed pump (MBFP) shutdown and failure of the main turbine generator to runback after the loss of the 21 MBFP. The main turbine has a non-safety related control circuit that

automatically reduces the load on the turbine to a predefined level if the circuit senses plant power is greater than 85% and a MBFP is rotating at a rate of less than 3300 revolutions per minute (rpm). The purpose of this control circuit is to reduce the potential for a reactor trip due to a loss of a single MBFP. Because this circuit did not function, only the 22 MBFP, which is rated for about 60% power, was supplying feed water to the SGs. At the time, the SGs were producing 100% steam flow because the turbine runback circuitry did not function to runback and resulted in water levels decreasing in the four SGs. Control room operators inserted a manual reactor trip based on their conclusion they could not restore sufficient feed water to the SGs, or reduce the steam demand from the turbine, prior to an automatic reactor trip on low water level in the SGs.

Entergy personnel investigated the unexpected loss of the 21 MBFP and identified a stainless steel tube leak in the high pressure oil system associated with the 21 MBFP control system that caused reduced oil pressure below the MBFPs low oil pressure turbine trip setpoint. Entergy personnel determined the tube failed due to vibration induced metal fatigue. Entergy personnel performed extent of condition inspections on similar components in the 21 and 22 MBFP control oil systems. Entergy replaced the damaged tube and restored the system to service.

Entergy engineers and maintenance technicians initiated troubleshooting activities on the main turbine runback circuitry to determine the cause of the turbine runback failure during the transient. Entergy personnel were not able to identify a malfunctioning component in the runback circuitry. Entergy technicians tested the inputs to the system and tested the circuit's operation including the MBFP turbine tachometer dropout relays and did not identify the malfunction experienced with the turbine runback circuitry. Station management implemented its decision making process and determined it was safe to startup the plant based on completed troubleshooting activities of this non safety-related circuitry in which operators are trained to respond to this scenario.

The inspectors performed system walkdowns, interviewed personnel, and reviewed design basis documents, troubleshooting plans, station procedures, and engineering evaluations.

b. Findings

The inspectors concluded that operators responded appropriately to the transient in accordance with their procedures and training. The inspectors also concluded that Entergy's efforts at identifying the cause and extent of condition was adequate. Furthermore, the inspectors concluded that Entergy's troubleshooting efforts to identify potential problems with the turbine runback circuitry were reasonable to demonstrate this function prior to plant restart. The following self-revealing finding was identified in relation to the installation of the MBFP hydraulic control system:

Introduction. A self-revealing Green finding was identified because Entergy personnel did not establish adequate instructions in a design change package which resulted in incorrectly installed tubing in the 21 main boiler feed water pump (MBFP) hydraulic control system that subsequently failed due to fatigue.

Description. On April 3, 2009, the 21 MBFP tripped off-line and steam generator water levels began to lower. The automatic main turbine runback circuitry did not actuate as designed to reduce main turbine steam demand. The control room operators attempted to manually reduce the main turbine steam demand but steam generator water inventory reduced to a level that required the operators to manually trip the reactor. Entergy personnel investigated

the 21 MBFP trip and identified that a broken tube fitting resulted in high pressure control oil leaking to the oil sump and a subsequent trip of the 21 MBFP on low oil pressure.

Entergy staff sent the failed fitting to a vendor to be analyzed. The analysis determined the tubing likely failed from chronic cyclical stresses. Entergy personnel determined the tubing was installed incorrectly in 1986 when an engineering modification was implemented to upgrade the MBFP control system. Specifically, the stainless steel tubing was installed in a straight line with inadequate room to flex or expand, contrary to vendor installation instructions and existing maintenance procedures for installing tubing and Swagelok fittings. The vendor and maintenance procedures required that tubing be installed with "U" shape bends to allow for expansion and flexing. Entergy's root cause identified the engineering modification package used at the time of installation did not provide guidance on the tubing layout and did not provide specific instructions for tubing installation that were available in vendor manuals and site maintenance procedures. The root cause team confirmed that Swagelok installation manuals dating back to 1972 contained information on the proper use of gap gauges and examples of correct/incorrect tubing routing installations. The station's design change procedure required (section 5.3.11, Detailed Design Activities) that the design change package included specific installation and inspection requirements that are not addressed in existing installation specifications including known precautions and limitations. Contrary to the design change procedure, specific instructions were not provided to ensure Swagelok fittings and tubing runs were installed in accordance with station procedures or vendor requirements including precautions to never run tubing in a straight run between rigid mounts. The inspectors determined it was reasonable for the station to provide correct guidance to the field installers in 1986 because the design change process required specific instructions to be provided and the design change packages were reviewed by multi-disciplined teams, including the maintenance department, who were cognizant of the standards for the installation of Swagelok fittings.

Entergy personnel inspected the MBFP control system tubing for the 21 and 22 MBFPs on Unit 2 and the 31 and 32 MBFPs on Unit 3. Entergy personnel identified a similar configuration on the 22 MBFP and replaced the tubing with the proper arrangement; the tubing on the Unit 3 MBFPs was found to be installed properly. Entergy personnel also developed corrective actions to evaluate training improvements for the installation or maintenance of tubing and compression fittings for site and supplemental personnel. Entergy personnel plan to inspect and evaluate other compression fitting installations associated with other high speed rotating equipment.

Analysis. The inspectors determined that a performance deficiency existed in that Entergy engineers did not provide adequate instructions to workers in order to install tubing in the MBFP control system in accordance with their design change program and vendor specifications.

The finding was more than minor because it was associated with the design control attribute of the Initiating Events cornerstone and affects its objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the incorrectly installed MBFP control tubing resulted in a loss of the 21 MBFP and, ultimately, a reactor trip due to low steam generator water level. In accordance with IMC 0609, Attachment 0609.04, "Initial Screening and Characterization of Findings," the inspectors conducted a Phase 1 screening and determined this finding required a Phase 2 analysis because the finding contributed to both the likelihood of a reactor trip and the likelihood that the mitigation equipment functions will not be available (loss of redundancy in the feedwater system for other initiating events).

The inspectors determined the finding was of very low safety significance (Green) using the Phase 2 Indian Point Unit 2 Risk-Informed Inspection Notebook, in accordance with IMC 0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-Power Situations." The inspectors determined that the exposure time was <3 days because the failure mechanism was a slow cyclic fatigue that resulted in failure only after the material had degraded to an unacceptable thickness and had demonstrated acceptable operation over the previous year while the MBFP was in operation. Using the <3 day exposure time, the inspectors solved: the Transient with Loss of Power Conversion System (TPCS) worksheet, increasing the likelihood of the initiating event by one order of magnitude, to address the increased likelihood of a reactor trip; and the Transients with Power Conversion System Available (TRANS) and Loss of Component Cooling Water (LOCCW) worksheets to address the loss of feedwater pump redundancy. This Phase 2 SDP estimated the increase in core damage frequency to be in the range of 1 in 50,000,000 years of reactor operation (low E-8 range). This range represents a finding of very low safety significance (Green). The dominant core damage sequence was a TPCS initiating event mitigated by the remaining ability to remove heat from the reactor core using auxiliary feed water or the primary bleed and feed functions.

The inspectors determined there was no cross-cutting aspect associated with the finding because the performance deficiency did not reflect current licensee performance. Specifically, the performance deficiency occurred over 20 years ago and procedures have been improved in the design control, work control and vendor control processes since 1986 that reduce the likelihood of vendors working on equipment without the sufficient training or work instructions.

Enforcement. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement, and the equipment involved is not safety related. Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as **FIN 05000247/2009003-01, Inadequate Design Change Package for Installation of Main Boiler Feed Pump Control System Tubing.**

- .2 (Closed) LER 2009-001-00, "Technical Specification Prohibited Condition Due to a Surveillance Requirement Not Previously Performed for the Atmospheric Steam Dump Valve Local Nitrogen Controls."

The inspectors reviewed Licensee Event Report (LER) 2009-001-00 dated April 27, 2009, to verify the LER was completed in accordance with 10 CFR 50.73 and that corrective actions identified were appropriate. The inspectors reviewed the circumstances of the January 2009 event and entries into the corrective action program including the apparent cause analysis. The LER reported that a TS-required surveillance requirement (SR 3.3.4.2) was not previously performed for the nitrogen back-up supply to the steam generator atmospheric dump valves (ADVs). Specifically, Entergy personnel did not verify the nitrogen backup supply control circuit and transfer switch to the steam generator ADVs were capable of performing their intended function. Entergy personnel discovered this following testing of an engineering modification that installed an additional nitrogen supply for the atmospheric steam dump valves (ADVs) and determined that two of the four ADVs positioners were setup incorrectly. The equipment errors resulted in the failure of the valves to stroke open using the nitrogen backup supply; however, because of the design of the system, Entergy personnel determined the valves were able to stroke open using the normal station air supply. Because all four valves could operate using the station air system, and at least one

ADV was operable using the nitrogen backup supply at all times in accordance with design requirements, the inspectors determined that no complete loss of ADV function had occurred. Entergy personnel repaired the positioners and established corrective actions to develop tests for the nitrogen backup supply and verified that the TS surveillance requirements have tests associated with them and are properly scheduled. Entergy documented the issues described above in CRs: IP2-2009-00062, -00069, -00077, -00137, and -00983.

The LER described a violation of TS 3.3.4, "Remote Shutdown." The enforcement aspects of this finding are discussed in Section 4OA7. This LER is closed.

4OA5 Other Activities

Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

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

b. Findings

No findings of significance were identified.

4OA6 Meetings

Exit Meeting Summary

On July 22, 2009, the inspectors presented the inspection results to Mr. Joseph Pollock and other Entergy managers and staff, who acknowledged the inspection results. Entergy staff identified documents which were to be considered proprietary and handled as such.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy, for being dispositioned as a Non-Cited Violation.

- Technical Specification Surveillance Requirement Not Previously Performed for Steam Generator Atmospheric Dump Valves

As described above in Section 4OA5.2, on January 7, 2009, following installation and post-work testing of an additional backup nitrogen supply to the ADVs, Entergy personnel identified that surveillance tests for the nitrogen backup supplies to the ADVs were never performed contrary to TS surveillance requirement 3.3.4.2.

The inspectors determined this constituted a violation of TS 3.3.4, "Remote Shutdown," which includes the TS surveillance requirement to verify that the nitrogen backup supply

control circuit and transfer switch to the steam generator ADVs are capable of performing their intended function. Contrary to this requirement, Entergy personnel did not verify the functionality of the control circuitry associated with the nitrogen backup supply to the ADVs. The inspectors determined this issue was of very low safety significance (Green) per SDP Phase 1 screening because the safety function of the ADVs was not lost. Specifically, the inspectors determined the remote shutdown function for the steam generator requires only one ADV to be operable. All four ADVs were capable of being operated with the normal station air supply. Entergy personnel entered the issues into the corrective action program as CR-IP2-2009-00062, -00069, -00077, -00137, and -00983.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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

J. Pollock, Site Vice President
 A. Vitale, General Manager, Plant Operations
 K. Davison, Assistant General Manager, Plant Operations
 P. Conroy, Director of Nuclear Safety Assurance
 B. Sullivan, Emergency Planning Manager
 A. Williams, Site Operations Manager
 S. Verrochi, System Engineering Manager
 T. Orlando, Director, Engineering
 R. Walpole, Licensing Manager
 T. Cole, Project Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSEDOpened and Closed

| | | |
|---------------------|-----|---|
| 05000247/2009003-01 | FIN | Inadequate Design Change Package for Installation of Main Boiler Feed Pump Control System Tubing (Section 4OA3) |
|---------------------|-----|---|

Closed

| | | |
|---------------------|-----|--|
| 05000247/2009001-00 | LER | Technical Specification Prohibited Condition Due to a Surveillance Requirement Never Performed for the Atmospheric Steam Dump Valve Local Nitrogen Controls (Section 4OA3) |
|---------------------|-----|--|

LIST OF DOCUMENTS REVIEWED**Section 1R01: Adverse Weather Protection**Procedures

IP-SMM-OP-104, Offsite Power Continuous Monitoring and Notification
 OAP-048, Seasonal Weather Preparation, Rev. 4
 OAP-008, Severe Weather Preparations, Rev. 5
 IP-SMM-OP-104, Non Quality Related, Rev. 8

Condition Reports

| | | | |
|----------------|----------------|----------------|----------------|
| IP2-2009-00253 | IP2-2008-05472 | IP2-2009-02487 | IP2-2009-01589 |
| IP3-2009-02358 | IP3-2009-02487 | IP2-2007-02319 | IP2-2007-03855 |

| | | | |
|----------------|----------------|----------------|----------------|
| IP2-2008-00286 | IP2-2008-00530 | IP2-2008-01640 | IP2-2008-01699 |
| IP2-2008-04230 | IP2-2008-04812 | IP2-2008-05372 | |

Section 1R04: Equipment Alignment

Procedures

2-COL-4.1.1, Rev. 22, Component Cooling System
2-SOP-4.1.2, Rev. 34, Component Cooling System Operation
2-SOP-24.1, Rev. 56, Service Water System Operation
2-COL-10.2.1, Rev. 19, Containment Spray System
2-SOP-3.1, Rev. 63, Charging, Seal Water, and Letdown Control
2-COL-3.1, Rev. 39, Chemical and Volume Control System

Calculations

FMX-00227, Pipe Flow Calculation of Service Water System, Rev. 2
MMS-00039-00, IP2 Verification of the Design of the Existing 10 Atmospheric Vent at the SW
Outlet of CCWHX, Rev. 0

Condition Reports

| | | | |
|----------------|----------------|----------------|----------------|
| IP2-2008-00778 | IP2-2008-00589 | IP2-2008-00813 | IP2-2008-01213 |
| IP2-2008-02852 | IP2-2009-00274 | IP2-2009-00387 | IP2-2009-00428 |
| IP2-2009-01792 | IP2-2004-01716 | | |

Drawings

B235504-00
9321-2722
ISI-209762
9321-2033
A208368

Miscellaneous

IP2-SW-DBD, Rev. 1, "Service Water System Design Basis Document"

Section 1R05: Fire Protection

Procedures

Fire Protection Program Plan, Rev. 9
Indian Point, Unit 2, Fire Hazards Analysis, Rev. 3
EN-DC-161, Control of Combustibles, Rev. 2
IP-EP-120, Emergency Classification
IP-EP-AD13, EAL Technical Bases

Condition Reports

| | | | |
|----------------|----------------|----------------|----------------|
| IP2-2009-01793 | IP2-2009-01987 | IP2-2009-01994 | IP2-2009-02699 |
| IP2-2009-02151 | IP2-2009-02186 | IP2-2009-02104 | |

Miscellaneous

IP2-RPT-03-00015, IP2 Fire Hazards Analysis, Rev. 2
 PGI-00433, Combustible Loading Calculation, Rev. 0

Section 1R06: Flood Protection Measures

Procedures

2-AOP-Flood, Rev. 6, Flooding

Miscellaneous

Individual Plant Examination of External Events for Indian Point Unit 2
 IP-RPT-04-00230, Rev. 1, Indian Point Unit 2 Probabilistic Safety Assessment

Section 1R11: Licensed Operator Regualification Program

Procedures

2-E-0, Reactor Trip or Safety Injection
 2-E-1, Loss of Reactor or Secondary Coolant
 2-ES-1.2, Post LOCA Cooldown and Depressurization
 2-AOP-NI-1, Nuclear Instrument Failure
 2-SOP-13.1, Excore Nuclear System Operation

Miscellaneous

Lesson Plan LRQ-SES-05

Section 1R12: Maintenance Effectiveness

Procedures

2-SOP-10.1.1, Rev. 50, Safety Injection Accumulators and Refueling Water Storage Tank Operations
 2-ECA-3.2, Rev. 0, SGTR with Loss of Reactor Coolant – Saturated Recovery Desired
 2-ECA-3.2 BG, Rev. 0, SGTR with Loss of Reactor Coolant – Saturated Recovery Desired
 Background Document
 EN-DC-151, Rev. 1, PSA Maintenance and Update
 EN-NE-G-008, Rev. 0, Probabilistic Safety Assessment Success Criteria
 2-PT-Q38, Rev. 10, Primary WATER Storage Tank Level
 2-ARP-SCF, Rev. 41, Condensate and Boiler Feed
 2-PT-Q026B, 22 Service Water Pump, Rev. 11 (completed 6/30/03)
 2-PT-Q026B, 22 Service Water Pump, Rev. 13 (completed 11/29/04, 2/6/05, 3/11/05)
 2-PT-Q026B, 22 Service Water Pump, Rev. 14 (completed 1/9/06)
 2-PT-Q026B, 22 Service Water Pump, Rev. 15 (completed 3/5/07)

Condition Reports

| | | | |
|----------------|----------------|----------------|----------------|
| IP2-2009-00373 | IP2-2007-00746 | IP2-2007-02957 | IP2-2008-00441 |
| IP2-2008-03184 | IP2-2008-04925 | IP2-2008-04926 | IP2-2009-00373 |
| IP2-2009-02383 | IP2-2009-00941 | IP2-2009-00806 | IP2-2009-01208 |
| IP2-2009-02378 | IP2-2009-01999 | IP2-2004-06571 | IP2-2000-05339 |
| IP2-2006-06056 | IP2-2009-01691 | IP2-2009-01999 | IP2-2009-01691 |
| IP2-2003-00037 | IP2-2003-02129 | IP2-2003-07075 | IP2-2004-06577 |

IP2-2005-03710 IP2-2005-03375 IP2-2006-06056 IP2-2003-07457
 IP2-2004-02489 IP2-2004-06571

Work Orders

51803577 52025617

Drawings

9321-F-2724
 9321-F-3005
 262929
 248513

Miscellaneous

Maintenance Rule Basis Document Primary Water Make-Up System
 IP-RPT-04-00230, Rev. 1, Indian Point Unit 2 Probabilistic Safety Assessment
 Maintenance Rule Basis Document Control Rod Drives
 Indian Point, Unit 2, Maintenance Rule Basis Document, Control Rod Drives (CRD)
 Letter from Sulzer to Entergy, dated May 29 2009: Sulzer Review of Service Water Pump #22
 Operation with Bearing Failure (Rev. 1)

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

IP-SMM-WM-101, On-Line Risk Assessment
 2-ES-1.3, Transfer to Cold Leg Recirculation, Rev. 2
 2-PT-M108, RHR/SI/CS System Venting, Rev. 6
 0-VLV-413-MOV, Motor Operated Valve Minor Preventive Maintenance, Rev. 4
 EN-LI-119, Apparent Cause Evaluation (ACE) Process, Rev. 8

Condition Reports

IP2-2009-0018 IP-2009-0027 IP2-2009-02381 IP2-2009-02376

Work Orders

00179105 51802108 51794752 00172251 51807981 51794753
 51803576 51803575 51697357 51803578 51665053

Miscellaneous

Operator's risk report dated 4/14/09

Section 1R15: Operability EvaluationsProcedures

PT-R35, Inservice Valve Tests, Rev. 11
 PMS-B-002-A, Worthington (#22) Auxiliary Boiler Feed Pump Turbine 10-Year Dismantled
 Inspection, Rev. 0
 EN-LI-100, Process Applicability Determination, Rev. 2

Condition Reports

IP2-2009-01440 IP2-2009-01473 IP2-2009-02085
 IP2-2009-01756 IP2-2009-02380 IP2-2001-01383

| | | |
|----------------|----------------|----------------|
| IP2-2009-01474 | IP2-2009-01474 | IP2-2006-03903 |
| IP2-2006-00705 | IP2-2007-02886 | IP2-2009-01474 |
| IP2-2009-02135 | IP2-2009-02136 | |

Drawings
9321-2041

Miscellaneous
Seat Leak on PCV-1139 Steam Supply to 22 Aux Boiler Feed Pump Turbine, ODMI dated 5/5/09
PQE-8.3, Rev. 0, Thermal Aging Evaluation of Main Steam SOVs

Section 1R18: Plant Modifications

Procedures
EN-DC-136, Temporary Modifications, Rev. 3
EN-LI-119, Apparent Cause Evaluation (ACE) Process, Rev. 8
2-AOP-RCP-1, Reactor Coolant Pump Malfunction, Rev. 8
EN-OP-111, Operational Decision-Making Issue (ODMI) Process, Rev. 3

Condition Reports (CR-IP2-2009-)

| | | | | | |
|-------|-------|-------|-------|-------|-------|
| 00655 | 00552 | 05228 | 05195 | 01672 | 01664 |
| 00670 | 00655 | 02044 | | | |

Work Orders
00193961 00183179

Miscellaneous
EC-15213, Provide Remote Oil Fill Capability for 21RCP Lower Oil Reservoir Due to Oil Leakage

Section 1R19: Post-Maintenance Testing

Procedures
EN-MA-101, Conduct of Maintenance
EN-WM-105, Planning
2-PC-R58, 480 Volt Undervoltage Relay Calibration
0-VLV-462-SWS, Multiplex Crispin Combination Valve Preventive Maintenance
OAP-24, "Operations Testing," Rev. 3
0-TWS-401-CWS, Rev. 4, Traveling Water Screen Preventive Maintenance Inspection
EN-MA-118, Rev. 4, Foreign Material Exclusion

Condition Reports

| | | |
|----------------|----------------|----------------|
| IP2-2009-01390 | IP2-2009-02112 | IP2-2009-02105 |
|----------------|----------------|----------------|

Work Orders

| | | | | | |
|----------|----------|----------|----------|----------|----------|
| 51794751 | 51640226 | 51671207 | 51671204 | 00148471 | 00120168 |
| 51263683 | | | | | |

Drawings

93201-II-3117-22, 480V Bus 5A & 6A Undervoltage

Miscellaneous

EPRI Report 1009709, Post Maintenance Testing Guide, Rev. 1

Section 1R22: Surveillance Testing

Procedures

0-SOP-LEAKRATE-001, RCS Leakrate Surveillance, Evaluation and Leak Identification, Rev. 1

2-PT-Q38, Primary Water Storage Tank Level, Rev. 10

2-PT-M108, RHR/SI/CS System Venting, Rev. 6

2-PT-Q030C, 23 Component Cooling Water Pump, Rev. 18

2-PT-Q59, Containment Pressure Bistables, Rev. 10

2-PT-Q029B, 22 Safety Injection Pump, Rev. 18

2-PT-Q030C, 23 Component Cooling Water Pump, Rev. 18

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

Work Orders

52033969 51802288 52028739 52028903 51802291

Section 2PS2: Radioactive Material Processing and Transportation

Procedures

Process Control Program, EN-RW-106, Rev. 1

Radioactive Shipping Procedure, EN-RW-102, Rev. 6

14-170 and 8-120 Cask/Liner Handling Procedure, VY-OPF 2511, Rev. 42

Section 4OA1: Performance Indicator Verification

Procedures

EN-EP-201, "Performance Indicators," Rev. 6

EN-LI-114, "Performance Indicator Process," Rev. 3

NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Rev. 5

Section 4OA2: Identification and Resolution of Problems

Procedures

EN-DC-114, "Project Management," Rev. 9

EN-HU-104, "Engineering Task Risk and Rigor," Rev. 2

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

EN-LI-106, "NRC Correspondence," Rev. 4

IP-SMM-LI-123, "Coordination of the New York State Public Service Commission
Regulatory Requirements," Rev. 1

0-ELC-425-TER, "Installation of Electric Motor Terminations," Rev. 0

ENN-EE-S-008-IP, "Electrical Cable Installation Standard," Rev. 4

2-PMP-004-SWS, "IP2 Service Water Pump and Motor Replacement Procedure"

2-PT-R084C, "23 EDG 8 hour load test," Rev. 11

0-XFR-403-ELC, "Station or Unit Auxiliary Transformer Preventive Maintenance," Rev. 4

0-XFR-409-ELC, "Westinghouse URT Tap Changer Inspection and Maintenance," Rev. 0

A-7

EN-HU-101, "Human Performance Program", Rev. 6
EN-HU-102, "Human Performance Tools", Rev. 5
EN-HU-105, "Human Performance – Managed Defenses", Rev. 6
3-PT-Q98A, Steam Line Pressure Functional Test – Channel 1, Rev. 4
2-TOP-014, Compensatory Actions for Repairs to the Recirculation Line to CST
PI-3Y100, Inservice Inspection Pressure Tests
OAP-017, Plant Surveillance and Operator Rounds

Condition Reports

| | | | |
|-------------------|----------------|----------------|-------------------|
| IP2-2008-00389 | IP2-2009-01236 | IP2-2009-01237 | IP2-2009-01239 |
| IP2-2009-01240 | IP2-2009-01533 | IP2-2009-01924 | IP3-LO-2008-00151 |
| IP3-LO-2008-00173 | IP2-2007-00305 | IP2-2007-00945 | IP2-2007-01634 |
| IP2-2007-01874 | IP2-2007-01909 | IP2-2007-01982 | IP2-2007-02145 |
| IP2-2007-02680 | IP2-2007-02972 | IP2-2007-03129 | IP2-2007-03219 |
| IP2-2007-03955 | IP2-2007-04034 | IP2-2007-04596 | IP2-2007-04761 |
| IP2-2007-04810 | IP2-2007-04978 | IP2-2007-05184 | IP2-2007-05222 |
| IP2-2008-01258 | IP2-2008-01945 | IP2-2008-02451 | IP2-2008-02723 |
| IP2-2008-02954 | IP2-2008-03251 | IP2-2008-03929 | IP2-2008-04395 |
| IP2-2008-04770 | IP2-2008-04779 | IP2-2009-00782 | IP2-2009-01064 |
| IP2-2009-01269 | IP2-2009-00104 | IP2-2009-00257 | IP2-2009-00419 |
| IP2-2009-01284 | IP3-2009-01170 | IP3-2009-02494 | IP3-2009-01550 |
| IP3-2009-01903 | IP2-2009-02397 | IP2-2009-00666 | IP2-2009-00760 |
| IP2-2006-02751 | | | |

Work Orders

| | | | | |
|-------------|--------------|-------------|-------------|----------|
| NP-99-10590 | IP2-02-32878 | 140111 | 00125119 | 51304391 |
| 00196415-29 | 51794754-01 | 51796053-01 | 51794751-01 | |
| 51554842-01 | | | | |

Drawings

20348, condensate storage tank siphon break in return line
9321-F-2018, condensate and boiler feed suction flow diagram
9321-F-2263, yard area – condensate storage tank to turbine building condensate piping plan
9321-F-2019, boiler feedwater
A211784-30, cold water deaerator system piping
9321-F-1024, containment building backfilling and grading north and east side
Chemistry logs for 11/13/2008
Tritium analysis data from 11/13/2008

Miscellaneous

Drawing 5341D31, "FOA/FOA Transformer-URT Tapchanger Schematic Wiring Diagram,"
Rev. 7
IMD-APL-09-001, 2008-2009 Maintenance Department Performance Improvement Plan
Change Management Notice – Job/Task Focused Coaching and Observation Program
2009 YTD Human Performance Report
3R15 Human Performance Report
Technical Requirements Manual Section 3.7.E City Water Supply
Calculation FFX-00104-00, Check the Minimum Line Size to Allow the City Water Header to
Provide the Aux Feedwater Pumps with 800 gpm
Graph TC-6, Condensate Storage Tank

IP2 Fourth Ten-Year Interval Inservice Inspection (ISI)/Containment Inservice Inspection (CISI)
Program Plan, Rev. 1, 12/29/2008
Vendor report 0900235.402, Analysis of 8" Condensate Return Line Failure

Performance Indicators

IPEC Personnel Error Rate
IPEC Human Performance Cycle Event Rate
IPEC Contact Time (Human Performance)
IPEC Non-Consequential Precursor Error Rate
IPEC Coaching Contact Time (Radiation Protection)

Section 4OA3: Event Follow-up

Procedures

2-AOP-FW-1, Rev. 11, Loss of Main Feedwater
2-E-0, Rev. 0, Reactor Trip or Safety Injection
2-POP-3.2, Rev. 36, Plant Recovery from Trip, Hot Standby
EN-DC-115, Engineering Change Process
EN-DC-141, Design Inputs
EN-MA-126, Control of Supplemental Personnel
SAO-405, Rev. 15, Engineering Change Process
DE-S-12.621, Engineering Standard
SAQ-405, Engineering Change Process, Rev. 15
DE-S-12.621, Engineering Design and Programmatic Review, Rev. 0

Condition Reports

| | | | |
|----------------|----------------|----------------|----------------|
| IP2-2009-01179 | IP2-2009-01194 | IP2-2008-05621 | IP2-2008-05636 |
| IP2-2009-00069 | IP2-2009-00077 | IP2-2009-00137 | IP2-2009-00983 |
| IP2-2009-00062 | | | |

Work Orders

189430

Miscellaneous

Modification package CFN-85-20717-00, main boiler feed pump turbine speed control system upgrade
Post Transient Evaluation dated 4/03/09
IP-RPT-05-00071, Appendix R, Safe Shutdown Analysis Report

Drawings

2-SOP-18-1, Typical Atmospheric Relief Valve Control System

LIST OF ACRONYMS

| | |
|---------|--|
| ABFP | Auxiliary Boiler Feed Pump |
| ADAMS | Agency-wide Document and Management System |
| ADV | Atmospheric Dump Valve |
| AFPB | Auxiliary Feed Pump Building |
| ANS | Alert and Notification System |
| ASME | American Society of Mechanical Engineers |
| CFR | Code of Federal Regulations |
| CR | Condition Report |
| CST | Condensate Storage Tank |
| DAW | Dry Active Waste |
| DBD | Design Basis Document |
| DOT | U. S. Department of Transportation |
| EDO | Executive Director of Operations |
| ENTERGY | Entergy Nuclear Northeast |
| EP | Emergency Preparedness |
| IMC | Inspection Manual Chapter |
| IPEC | Indian Point Energy Center |
| IR | Inspection Report |
| LER | Licensee Event Report |
| MBFP | Main Boiler Feed Pump |
| NCV | Non-cited Violation |
| NDE | Non-destructive Examination |
| NRC | Nuclear Regulatory Commission |
| NRR | Nuclear Reactor Regulation |
| PARS | Publicly Available Records System |
| PCP | Process Control Program |
| PI | Performance Indicator |
| PI&R | Problem Identification and Resolution |
| RCA | Root Cause Analysis |
| SDP | Significance Determination Process |
| SG | Steam Generator |
| TPCS | Transient with Loss of Power Conversion System |
| TS | Technical Specifications |
| UFSAR | Updated Final Safety Evaluation Report |
| URI | Unresolved Item |
| WO | Work Order |