

November 12, 2004

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

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT 2 - NRC INTEGRATED
INSPECTION REPORT 05000247/2004008

Dear Mr. Dacimo:

On September 30, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Indian Point Nuclear Generating Unit No. 2. The enclosed integrated inspection report documents the inspection results, which were discussed on October 14, 2004 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. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

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

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure 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/

Brian J. McDermott, Chief
Projects Branch 2
Division of Reactor Projects

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

Enclosure: Inspection Report 05000247/2004008
w/Attachment: Supplemental Information

cc w/encl:

G. J. Taylor, Chief Executive Officer, Entergy Operations, Inc.
M. R. Kansler, President - Entergy Nuclear Operations, Inc.
J. T. Herron, Senior Vice President and Chief Operating Officer
C. Schwarz, General Manager - Plant Operations
D. L. Pace, Vice President, Engineering
B. O'Grady, Vice President, Operations Support
J. McCann, Director, Licensing
C. D. Faison, Manager, Licensing, Entergy Nuclear Operations, Inc.
P. Conroy, Manager, Licensing, Entergy Nuclear Operations, Inc.
M. Colomb, Director of Oversight, Entergy Nuclear Operations, Inc.
J. Comiotes, Director, Nuclear Safety Assurance
J. M. Fulton, Assistant General Counsel, Entergy Nuclear Operations, Inc.
P. R. Smith, President, New York State Energy, Research
and Development Authority
J. Spath, Program Director, New York State Energy Research and Development Authority
P. Eddy, Electric Division, New York State Department of Public Service
C. Donaldson, Esquire, Assistant Attorney General, New York Department of Law
T. Walsh, Secretary, NFSC, Entergy Nuclear Operations, Inc.
D. O'Neill, Mayor, Village of Buchanan
J. G. Testa, Mayor, City of Peekskill
R. Albanese, Executive Chair, Four County Nuclear Safety Committee
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
B. Brandenburg, Assistant General Counsel
P. Rubin, Manager of Planning, Scheduling & Outage Services
Assemblywoman Sandra Galef, NYS Assembly
County Clerk, Westchester County Legislature
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
D. Lochbaum, Nuclear Safety Engineer, Union of Concerned Scientists
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
Congresswoman Sue W. Kelly
Congresswoman Nita Lowey
Senator Hillary Rodham Clinton
Senator Charles Schumer
J. Riccio, Greenpeace
A. Matthiessen, Executive Director, Riverkeeper, Inc.
M. Kapowitz, Chairman of County Environment & Health Committee

Mr. Fred Dacimo

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A. Reynolds, Environmental Advocates
M. Jacobs, Director, Longview School
D. Katz, Executive Director, Citizens Awareness Network
P. Gunter, Nuclear Information & Resource Service
P. Leventhal, The Nuclear Control Institute
K. Coplan, Pace Environmental Litigation Clinic
R. Witherspoon, The Journal News
W. DiProfio, PWR SRC Consultant
D. C. Poole, PWR SRC Consultant
W. Russell, PWR SRC Consultant
W. Little, Associate Attorney, NYSDEC

Mr. Fred Dacimo

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Distribution w/encl: (via E-mail)

- S. Collins, RA
- J. Wiggins, DRA
- C. Miller, RI EDO Coordinator
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- P. Milano, PM, NRR
- D. Skay, PM, NRR (Backup)
- B. McDermott, DRP
- J. Shoppy, DRP
- C. Long, DRP
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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No. 50-247

License No. DPR-26

Report No. 05000247/2004008

Licensee: Entergy Nuclear Northeast

Facility: Indian Point Nuclear Generating Unit No. 2

Location: 295 Broadway, Suite 3
Buchanan, New York 10511

Dates: July 1, 2004 - September 30, 2004

Inspectors: P. Habighorst, Senior Resident Inspector
M. Cox, Resident Inspector
W. Cook, Senior Project Engineer
C. Long, Reactor Engineer
J. Noggle, Senior Radiation Specialist
J. Furia, Senior Radiation Specialist
T. Hipschman, Senior Resident Inspector
R. Berryman, Resident Inspector
S. Pindale, Senior Reactor Inspector
D. Silk, Senior Emergency Preparedness Inspector
E. H. Gray, Senior Reactor Inspector
M. Snell, Reactor Engineer

Approved by: Brian J. McDermott, Chief
Projects Branch 2
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000247/2004008; 07/1/04 - 09/30/04; Indian Point Nuclear Generating Unit No. 2: Maintenance Risk Assessment and Emergent Work Control.

The report covers a 3-month period of inspection by resident inspectors, and 7 regional inspectors. Two Green findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

1. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The inspectors identified a finding involving ineffective causal analysis for feedwater flow perturbations that led to a manual reactor trip on September 1, 2004. Ineffective causal analysis between September 1 - 5, resulted in two power escalation attempts without successfully identifying the direct cause of the feedwater flow perturbations. The effectiveness of Entergy's causal analysis was affected by informal troubleshooting and a variety of corrected equipment problems that did not support the underlying direct cause of the feedwater flow problem.

This finding is more than minor since if left uncorrected the finding would become a more significant safety concern. Specifically, if the effectiveness of Entergy's approach to causal analysis were not addressed, recurring plant transients and safety system challenges would result in a more significant safety concern. This finding affects the Initiating Event cornerstone since the two subsequent power changes did increase the likelihood of a reactor trip due to challenging reactor protection system (RPS) set points on steam generator level. The issue is considered to be of very low safety significance since the finding did not impact mitigation equipment availability or function. This issue was placed in Entergy's corrective action program (CAP) as CR-IP2-2004-04291. This finding is considered relevant to problem identification and resolution (PI&R) since it relates to Entergy's effectiveness in resolving problems (Section 1R13.1).

- Green. A self-revealing Green finding related to the failure to promptly identify a degraded condition between September 2 - September 24 associated with the 23 feedwater regulating valve (FWRV) solenoid SOV-E. The failure to promptly identify and correct deficiencies associated with SOV-E resulted in a manual reactor trip on September 24, 2004. Entergy's actions were ineffective in that feedwater (FW) piping walkdowns following several feedwater transients failed to identify degradation of the solenoids' L-shaped conduit bracket. Furthermore, on September 20, 2004, when degradation of the L-shaped bracket for SOV-E was identified, it was not entered in Entergy's CAP. Subsequently, the degraded L-shaped bracket for SOV-E led to a manual reactor trip on September 24.

This finding was greater than minor since it adversely affected the Initiating Events cornerstone objective of limiting the likelihood of those events that upset plant stability (manual reactor trip) and challenge critical safety functions (initiation of auxiliary feedwater due to a partial loss of main FW flow) during power operations. The finding was associated with the cornerstone attribute of equipment performance since the solenoid valve for the 23 FWRV impacted the reliability of an FW isolation signal. The finding is of very low safety significance because the failure of the FW isolation solenoid contributed to the likelihood of a reactor trip; however, it did not affect the likelihood that other mitigation systems would not be available. On September 24, 2004, this issue was placed in Entergy's CAP as CR-IP2-2004-04522. This finding is considered relevant to PI&R since it relates to Entergy's effectiveness in identifying problems (1R13.2).

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

Indian Point Nuclear Generating Unit No. 2 (IP2) was operating at 100 percent power at the start of the inspection report period. The unit remained at full power until September 1, 2004, when the reactor was manually tripped by operators due to flow oscillations on the 22 feedwater (FW) line. Power reductions were necessary (24 percent to less than 4 percent) during restart attempts on September 3 and September 5 related to unsuccessful repairs to the 22 feedwater regulating valve (FWRV). The 22 FWRV was successfully repaired and a power ascension to 70 percent was completed on September 6. Reactor power was maintained at this level during attempted repairs of the 21 main feedwater (MFW) pump discharge check valve. On September 15 reactor power was reduced to less than 4 percent to affect repairs with the FW system out of service. Power was restored to 100 percent on September 18. On September 24, 2004, operators initiated a manual reactor trip due to flow oscillations on the 23 FW line, caused by a solenoid valve failure on the 23 FWRV. Following repairs to the 23 FWRV, the unit returned to 97 percent power on September 25. The IP2 remained at 97 percent power through the end of the inspection period due to degradation of the 22 main turbine stop valve.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity [R]

1R01 Adverse Weather Preparation

a. Inspection Scope (71111.01 - 1 sample)

The inspectors reviewed Entergy procedure OAP-008, "Seasonal Weather Preparations," to verify that the checklists were completed in accordance with procedural requirements. On July 12, July 27, August 12, and August 13, 2004, the inspectors walked down outside areas to evaluate the susceptibility of external plant equipment to potential high winds, thunderstorms, tropical storms and hurricanes during that period. The inspectors evaluated accessible areas inside and outside of the plant's operating and auxiliary support structures to assess the adequacy of high wind measures. The inspectors also looked for vulnerable systems or components not previously identified by Entergy. The specific information reviewed is referenced in the Supplemental Information attachment at the end of this report.

b. Findings

No findings of significance were identified.

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1R04 Equipment Alignment

a. Inspection Scope (71111.04 - 4 samples)

The inspectors performed four partial system walkdowns during periods of system train unavailability in order to verify that the alignment of the available train was proper to support its required safety functions, and to assure that Entergy had identified and properly addressed equipment discrepancies that could potentially impair the capability of the available train. Referenced documents are listed in the Supplemental Information attachment at the end of this report. The following system walkdowns were performed:

- On July 13, 2004, the inspector performed a walkdown of the backup spent fuel pool makeup system during installation of temporary alteration (TA) 04-2-120 that had removed the normal makeup system alignment using primary water. The inspector used 2-AOP-FH-1, "Fuel Damage or Loss of Spent Fuel Pool (SFP)/Refueling Cavity Level," Revision 1, during the walkdown to assess the general condition of the system and to verify correct system alignment.
- On July 16, 2004, the inspector performed a system walkdown of the service water (SW) system alignment to the 21 and 23 emergency diesel generators (EDGs) while the 22 EDG was out of service for its 2-year preventive maintenance and lube oil and jacket water (JW) heat exchanger (HX) cleaning. The inspector verified the proper SW valve alignment and flow to the 21 and 23 EDG lube oil and JW HXs. The inspector reviewed system drawings and checkoff lists to verify proper alignment and observed the physical condition of the equipment during the verification.
- On August 3, 2004, the inspector performed a partial system walkdown of the 21 AFW train during scheduled planned maintenance on the 22 AFW turbine/pump coupling and in-service testing of flow control valves. The inspector used procedure 2-COL-21.3, "Steam Generator Water Level and Auxiliary Boiler Feedwater," Rev. 27, during the walkdown to assess the general condition of the system and to verify correct system alignment.
- On August 10, 2004, the inspector performed a system walkdown on the 22 and 23 EDG starting air and fuel oil systems while the 21 EDG was out of service for maintenance. The inspector reviewed system drawings and checkoff lists to verify proper alignment and observed the physical condition of the equipment during the verification.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

1. Fire Area Walkdowns

a. Inspection Scope (71111.05Q - 9 samples)

The inspector toured areas that were identified as important to plant safety and risk significant. The inspector consulted Section 4.0, "Internal Fires Analysis," and the top risk significant fire zones in Table 4.6-2, "Summary of Core Damage Frequency Contributions from Fire Zones," within the Indian Point 2 Individual Plant Examination for External Events (IPEEE). The objective of this inspection was to determine if Entergy had adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, and had adequately established compensatory measures for degraded fire protection equipment. The inspector evaluated conditions related to: 1) control of transient combustibles and ignition sources; 2) the material condition, operational status, and operational lineup of fire protection systems, equipment and features; and 3) the fire barriers used to prevent fire damage or fire propagation. Reference material used by the inspector to determine the acceptability of the observed conditions in the fire zones are referenced in the Supplemental Information attachment at the end of this report. The areas reviewed were:

- Zone 270, General Area of the 33' Elevation of the Superheater Building
- Zone 2, Containment Spray Pump Room
- Zone 66A, Service Water Valve and Strainer Pit
- Zone 22, Service Water Pumps
- Zone 43, 15' Elevation of the Turbine Building
- Zone 10, EDG Building
- Zone 7, Coolant Charging Pump (CCP) Room
- Zone 23, Coolant Charging Pump (CCP) Room
- Zone 18A, Primary Auxiliary Building Stairwell and Corridor

b. Findings

No findings of significance were identified.

2. Fire Drill

a. Inspection Scope (71111.05A - 1 sample)

On August 20, 2004, the inspectors observed an unannounced fire brigade drill. The drill was conducted in accordance with Entergy's preplanned drill scenario and simulated an electrical and lubricant fire in the 32 instrument air compressor. The drill was a routine training exercise for current fire brigade members. The inspectors evaluated the readiness of the fire brigade to suppress and contain the fire, and evaluated the following aspects of the drill:

- The fire brigade properly donned protective clothing/turnout gear.
- Self-contained breathing apparatus (SCBA) equipment was properly worn and used.
- Fire hose lines were capable of reaching all necessary fire hazard locations, were laid out without flow restrictions, and were simulated as charged with water.
- Brigade members entered the fire area in a controlled manner.
- Sufficient fire fighting equipment was brought to the scene by the fire brigade.
- The fire brigade leader's fire fighting directions were thorough, clear and effective.
- Radio communications with the plant operators and between fire brigade members were efficient and effective.
- Members of the fire brigade checked for fire victims and propagation into other plant areas.
- Effective smoke removal operations were simulated.
- The fire fighting pre-plan strategies were utilized.
- Entergy's pre-planned drill scenario was followed.
- The drill objectives and acceptance criteria were met.

The inspectors also observed the post-drill critique and evaluated it for thoroughness and degree of critical self-assessment.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope (71111.06 - 1 external sample)

The inspector reviewed Entergy's external flood analysis, flood mitigation procedures and design features to verify whether they were consistent with the design requirements. The inspector walked down selected external and internal plant areas that contained equipment important to safety. The inspector evaluated the condition and adequacy of mitigation equipment to assess whether flood protection design features were adequate and operable. The specific areas walked down by the inspector included:

- SW Strainer Pit
- 15' elevation of the Primary Auxiliary Building (PAB)
- 15' elevation of the Turbine Building

The inspector reviewed Entergy's flood mitigation procedures, and selected preventive maintenance and surveillance procedures associated with flood alarms and SW strainer pit sump pumps. The inspector reviewed the CAP to verify whether previous flood related issues had been appropriately evaluated and resolved. The specific information reviewed is referenced in the Supplemental Information attachment at the end of this report.

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b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope (71111.07A - 1 sample)

The inspectors performed an inspection of the component cooling water (CCW) HXs to verify that Entergy was monitoring performance on a continuing basis and to ensure that any potential deficiencies which could mask degraded performance were identified. The inspectors reviewed the design basis documents and FSAR to validate that testing acceptance criteria were appropriate. The inspectors also reviewed the latest inspection reports for both 21 and 22 CCW HXs and evaluated the results from eddy current testing and ensured that the appropriate tube plugging criteria were used. In addition, the inspectors verified that Entergy was maintaining their commitments from Generic Letter 89-13 concerning HX inspection and testing.

b. Findings

No findings of significance were identified.

1R11 Operator Requalification Inspection

Resident Quarterly Review

a. Inspection Scope (71111.11Q - 1 sample)

On September 13, 2004, the inspectors observed simulator training for licensed operators on Operations Team "2A." The inspectors reviewed an "as found" simulator scenario, performed under lesson plan SES-ES-1.2, "Pressurizer Pressure Master Controller Failure, Reactor Coolant Pump High Vibrations, and Reactor Coolant Pump Seal Leak" to determine if the scenario contained: 1) clear event descriptions with realistic initial conditions; 2) clear start and end points; 3) clear descriptions of visible plant symptoms for the crew to recognize; and 4) clear expectations of operator actions in response to abnormal conditions.

During the simulator exercise, the inspectors evaluated the team's performance for: 1) clarity and formality of communications; 2) correct use and implementation of emergency operating procedures (EOPs) and abnormal operating procedures (AOPs); 3) operators' ability to properly interpret and verify alarms; and 4) operators' ability to take timely actions in a safe direction based on transient conditions. In addition, the inspectors evaluated the control room supervisor's ability to exercise effective oversight and control of the crew's actions during the exercise. The inspectors verified that the feedback from the instructors was thorough, that they identified specific areas for improvement, and that they reinforced management expectations regarding crew

competencies in the areas of procedure use, communications, and peer checking. The inspectors also evaluated Entergy's post-scenario critique.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope (71111.12Q - 3 samples)

The inspectors reviewed the maintenance activities listed below, and recent performance issues with systems and components to assess the effectiveness of Entergy's Maintenance Rule (MR) program. Using 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," the inspectors verified that Entergy was implementing their MR program in accordance with NRC regulations and guidelines, properly classifying equipment failures, and using the appropriate performance criteria for MR systems in 10 CFR 50.65 (a)(2) status.

The inspectors also reviewed work orders (WOs), and associated post-maintenance test activities to assess whether: 1) the effect of maintenance work in the plant had been adequately addressed by control room personnel; 2) work planning was adequate for the maintenance performed; 3) the acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing documents; and, 4) the equipment was effectively returned to service. Referenced documents are listed in the Supplemental Information attachment at the end of this report. The below-listed maintenance activities were observed and evaluated.

- The inspector performed a review of maintenance issues associated with the SW system since August 2002 by evaluating the MR basis document to determine system boundaries and verified that the system was being properly tracked in accordance with the requirements of 10 CFR 50.65, "Requirements of Monitoring the Effectiveness of Maintenance." The inspector reviewed the quarterly system health inspection report for the 2nd quarter of 2004 and evaluated the system performance monitoring criteria for scope and accuracy. The inspector also reviewed condition reports (CRs) for the system and evaluated their proper classification for the MR and compliance with ENN-DC-171, Rev. 0, "Maintenance Rule Monitoring." Specifically, the inspector focused on WO IP2-02-32959 for the 22 SW pump replacement and the proper crediting of system unavailability to the MR tracking.
- The inspector performed a review of maintenance issues associated with the reactor protection system since August 2002 by evaluating the MR basis document to verify that the system was being properly tracked in accordance with the requirements of 10 CFR 50.65, "Requirements of Monitoring the Effectiveness of Maintenance." The inspector reviewed the quarterly system

health inspection reports for the 1st and 2nd quarters of 2004 and evaluated system performance monitoring criteria for scope and accuracy. The inspector also reviewed CRs for the system and evaluated their proper classification for the MR program and compliance with ENN-DC-171, Rev. 0, "Maintenance Rule Monitoring."

- The inspectors performed a review of maintenance issues associated with the EDGs since July 2003. The inspectors reviewed the MR basis document for the system to review the system monitoring requirements and ensure that the system was being properly tracked. The inspectors also reviewed the quarterly system health reports for the previous 12 months and reviewed WOs and CRs associated with the system to ensure they were being properly classified.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessment and Emergent Work Control

a. Inspection Scope (71111.13 - 6 samples)

The inspectors observed selected portions of emergent maintenance work activities to assess Entergy's risk management in accordance with 10 CFR 50.65(a)(4). The inspectors verified that Entergy took the necessary steps to plan and control emergent work activities, to minimize the probability of initiating events, and to maintain the functional capability of mitigating systems. Reference materials used by the inspectors are listed in the Supplemental Information attachment at the end of this report. The inspectors observed and/or discussed risk management with maintenance and operations personnel. The following planned activity was observed:

- WO IP2-04-26427: Troubleshooting 21 main boiler FW pump discharge check valve BFD-1

The inspectors observed emergent maintenance activities on the Unit 2 FW pump discharge check valve (BFD-1) on its failure to close with a resulting backflow of water through the 21 MFW pump. On September 14, 2004, Entergy installed specialized hot tapping equipment with the capability of inserting a pipe plug in the suction side piping of the 21 MFW pump in an effort to support repair of the check valve while the plant was at 70 percent power. However, this approach was unsuccessful and on September 15, 2004, the unit was put in hot shutdown to take the FW system out of service. Check valve BFD -1 was opened for inspection and repairs were initiated. The repairs were successful and the plant was returned to power on September 18, 2004.

Inspectors observed the hot tap cutting and pipe plug equipment, the pre and post cutting conditions, the nature and location of cutting chips, controls to remove the chips, the BFD-1 check valve internals, and reviewed the related engineering, operational and maintenance planning, work controls and documentation.

The following five emergent activities were observed:

- WO IP2-04-26108: Troubleshooting 22 main FWRV (FCV-427) erratic operation
- WO IP2-04-26110: Open, Inspect, Replace trim set on 22 FWRV as required IAW maintenance procedure AOV-B-012-A, and VMS-B-002
- WO IP2-03-30434 (CR IP2-2003-06614): Evaluation, Tighten stem clamp on 22 FWRV to eliminate the possibility of stem rotation
- WO IP2-04-21486, "Contingency WO for GT-1 Compressor Bearing High Temperature Issue" and WO IP2-03-23263, "Gas Turbine GT-1 Functional"
- WO: IP2-04-24666, Replace controller TC-441C/D

b. Findings

1. Introduction. The inspectors identified a Green finding involving ineffective causal analysis for feedwater flow perturbations that led to a manual reactor trip on September 1, 2004. Ineffective causal analysis between September 1 - 5, resulted in two power escalation attempts without successfully identifying the direct cause of the feedwater flow perturbations. The effectiveness of Entergy's causal analysis was affected by informal troubleshooting and a variety of corrected equipment problems that did not support the underlying direct cause of the feedwater flow problem.

Description. As of September 3, 2004, Entergy's causal analysis for the FW flow perturbations on September 1 concluded that the 22 FWRV (FCV-427) valve stem to actuator connection had loosened, causing the flow variations. The causal analysis was primarily based upon operating experience at Indian Point Unit 2 since this condition had occurred in August 2001 (CR 2001-8263). Entergy's rationale for the FW flow variations was that hydraulic/harmonic resonance in the FW system caused the valve alignments and actuator to stem collar loosening. Engineering had planned to further confirm the FW harmonic resonance by analysis after plant restart. Confirmation of the apparent cause did not occur, since the subsequent plant start-up Entergy did not monitor the functioning of the 22 FWRV as it was placed into service. Entergy replaced the FCV-427 valve plug and stem and performed a general visual inspection of the valve body and cage without specific acceptance criteria. The causal analysis used an informal troubleshooting plan typically used by maintenance personnel. However, during a power ascension on September 3, 2004, flow in the 22 FW line was again found to be erratic. Entergy subsequently reduced power to continue the causal analysis and troubleshooting.

Between September 3 - 5, 2004, Entergy's causal analysis, was over-reliant on general guidance from other Entergy nuclear facilities without collaboration on its relationship to plant conditions on September 1. Furthermore, Entergy was over-reliant on the valve vendor's explanation of the significance of hydraulic fluid leaks from the valve's operator without collaboration on its relationship to plant conditions experienced on September 1. The causal analysis used an informal troubleshooting plan instead of the guidance contained within procedure IP-SMM-MA-103, "Indian Point Energy Center Troubleshooting and Repair." Maintenance replaced components of the 22 FWRV, such as solenoid valves and transducers; however, Entergy did not explore the causal

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relationship with respect to the FW transients. During a power ascension on September 5, 2004, flow in the 22 FW line was again found to be erratic. Entergy reduced power to continue the causal analysis and troubleshooting.

Following the September 5 power reduction, Entergy performed a more rigorous troubleshooting and evaluation process that documented the cause and corrected the condition for the 22 FWRV. Entergy eliminated 14 potential causes for the FW malfunction through a number of tests documented in WOs IP2-04-27675, IP2-04-27674, and IP2-04-27673. At 3:30 p.m. on September 5, 2004, Entergy confirmed that the direct cause of the September 1 manual reactor trip and the subsequent FW flow variations (during power escalations) was a loosened valve cage on the 22 FWRV.

Analysis. The performance issue involved inadequate causal analysis for the 22 FWRV between September 1 - 5 that resulted in two unnecessary plant power excursions until the cause was identified. This inspector-identified finding is more than minor since if left uncorrected the finding would become a more significant safety concern. Specifically, if the effectiveness of Entergy's approach to causal analysis were not addressed, recurring plant transients and safety system challenges would result in a more significant safety concern. This finding affects the Initiating Event cornerstone since the two subsequent power changes did increase the likelihood of a reactor trip due to challenging RPS set points on steam generator level with steam flow/ FW flow mismatch. The issue is considered to be of very low safety significance since it did not impact mitigation equipment availability or function. This issue was placed in Entergy's CAP as CR-IP2-2004-04291. This finding is considered relevant to PI&R since it relates to Entergy's effectiveness in resolving problems.

Enforcement. No violation of regulatory requirements occurred. The FWRV internals are not considered safety-related equipment. The inspector determined that the inadequate causal analysis occurred on a non-safety related component and, therefore, did not fall under the requirements of 10 CFR 50 Appendix B. **(FIN 50-247/04-08-01: Inadequate causal analysis for 22 feedwater regulating valve failure)**

2. Introduction. A self-revealing Green finding related to the failure to promptly identify a degraded condition between September 2 - September 24 associated with the 23 feedwater regulating valve (FWRV) solenoid SOV-E. The failure to promptly identify and correct deficiencies associated with SOV-E resulted in a manual reactor trip on September 24, 2004. Entergy's actions were ineffective in that feedwater (FW) piping walkdowns following several feedwater transients failed to identify degradation of the solenoids' L-shaped conduit bracket. Furthermore, on September 20, 2004, when degradation of the L-shaped bracket for SOV-E was identified, it was not entered in Entergy's CAP. Subsequently, the degraded L-shaped bracket for SOV-E led to a manual reactor trip on September 24.

Description. On September 2, 2004, Entergy identified a broken conduit to condulet fastener for FCV-437 SOV-E. SOV-E is a normally energized solenoid and de-energizes to close FCV-437 on an engineered safety feature FW isolation signal. The conduit to condulet fastener was repaired by maintenance personnel prior to the

initiation of a CR. CR IP2-2004-4071 was prepared and WO IP2-04-27146 was initiated to repair the conduit to conduit fastener during review of the CR (due to incomplete information about the actions already taken).

On September 20, Entergy's maintenance personnel were investigating WO IP2-04-27146 and identified another problem in that the L-shaped bracket for SOV-E cover was removed from its housing. The solenoid's L-shaped bracket provides the attachment point for the electrical conduit. The conduit for SOV-E is rigidly fastened to the solenoid valve by the L-shaped bracket and is also rigidly fastened to nearby structural steel in the room. Between September 1 - September 24, five FW transients occurred that resulted in physical movement of the FW pipe and FWRVs. A recent metallurgical analysis performed for Entergy on the L-shaped bracket concluded that the failure was due to a sudden force and not due to fatigue over a period of time. Entergy's actions in response to FW transients and observed pipe movement included inspections of the FW system piping and supports, but not the ancillary equipment such as the FWRV operators. Entergy's actions were ineffective in that their walkdowns failed to identify that FW piping displacement during the FW system transients placed inappropriate stresses on the L-shaped solenoid valve bracket. Furthermore, degradation of SOV-E on the 23 FWRV identified by Entergy on September 20 was not entered into the corrective action process or formally evaluated as a potential trip risk.

Analysis. The performance issue involved failure to promptly identify degraded conditions associated with the 23 FWRV SOV-E. The inspectors determined that the identification of a degraded condition and its significance were reasonably within Entergy's ability to foresee and correct, and a significant plant transient could have been prevented. This finding was greater than minor since it adversely affected the Initiating Events cornerstone objective of limiting the likelihood of those events that upset plant stability (manual reactor trip) and challenge critical safety functions (initiation of AFW due to a partial loss of MFW flow) during power operations. The finding was associated with the cornerstone attribute of equipment performance as the FW solenoid valve for the 23 FWRV impacted the reliability of an FW isolation signal. The finding is of very low safety significance because the failure of the FW isolation solenoid contributed to the likelihood of a reactor trip; however, it did not affect the likelihood that other mitigation systems would not be available. This issue was subsequently placed in Entergy's CAP as CR-IP2-2004-04522. This is considered a cross-cutting issue associated with PI&R. Entergy's root analysis for CR-IP2-2004-04522 concluded that improper orientation of the solenoid valve during a 2002 modification and lack of detail within the modification package on proper installation of the solenoid valve caused the failure. The inspectors agreed that the design modification errors in 2002 contributed to the failure of the solenoid on September 24, 2004; however, the opportunities to identify and correct the adverse condition based upon the FW system transients between September 2 - 24 are appropriate to the primary cause of the solenoid failure.

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No violation of regulatory requirements occurred. The inspector determined that the inadequate corrective actions did not impact the safety-related function of the solenoid operated valve on the 23 FWRV and, therefore, did not fall under the requirements of 10 CFR 50 Appendix B. **(FIN 50-247/04-08-02: Failure to promptly identify degraded conditions on the 23 feedwater regulating valve)**

1R14 Personnel Performance During Non-Routine Plant Evolutions and Events

a. Inspection Scope (71111.14 - 3 samples)

For the non-routine events described below, the inspectors reviewed operator logs, plant computer data, and strip charts to determine what occurred and how the operators responded, and to determine if the response was in accordance with plant procedures.

C On July 1, 2004, the inspectors observed the operations crew perform a manual heat balance calculation in accordance with procedure 2-SOP-15.1, "Reactor Thermal Power Calculations." A manual calculation was required due to a failure of a leading edge flow meter input into the computer program. The inspectors observed the collection of the required data by the operators to ensure its accuracy and reviewed the calculation results.

C On September 1, 2004, the inspectors observed the control room and plant operator activities following a manual reactor trip. The inspectors observed operator response, procedure usage, and evaluated the post-transient evaluation. The inspectors toured various locations within the AFW building and turbine building. A performance issue related to inadequate causal analysis is documented in Section 1R13.1 of this report.

C On September 24, 2004, the inspectors observed the control room and plant operator activities following a manual reactor trip due to FW flow reduction in the 23 steam generator. The inspectors observed operator use of EOPs, plant operating procedures and identification of equipment malfunctions. A performance issue concerning inadequate corrective actions that would have precluded this manual trip is documented in Section 1R13.2.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope (71111.15 - 5 samples)

The inspectors selected operability evaluations that Entergy had generated that warranted review on the basis of potential risk significance. The selected samples are

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addressed in the CRs listed below. The inspectors assessed the accuracy of the evaluations, the use and control of compensatory measures, if needed, and compliance with the Technical Specifications (TSs). The inspectors review included a verification that the operability evaluations were made as specified by procedure ENN-OP-104, "Operability Determinations." The technical adequacy of the evaluations was reviewed and compared to the TS, Technical Requirements Manual (TRM), the Final Safety Analysis Report (FSAR), and associated design basis documents.

- CR-IP2-2004-03426, Isolation Valve Seal Water Solenoid Valve (SOV)-7864 stroke time failure
- CR-IP2-2004-3138, Current Transformer Open Circuit Fire Potential
- CR-IP2-2004-3700, Potential impact on 22 Auxiliary Boiler Feed Pump (ABFP) due to leakby of steam isolation valve PCV-1139
- CR-IP2-2004-3473, Operability of 138kV offsite power while MVAR output from IP2 main generator was greater than that specified in the grid voltage study
- CR- IP2-2004-4535, Failure of #2 Main Turbine Stop Valve to fully open or close

b. Findings

No findings of significance were identified.

1R16 Operator Workarounds

a. Inspection Scope (71111.16 - 1 sample)

The inspectors performed a review of operator workarounds and burdens to assess the cumulative effects on system reliability, availability, and the potential for misoperation of a system. The inspectors also toured various areas of the plant to evaluate deficient conditions and their potential impact on operators during EOP and AOP usage. This review included the operator work-around and burden list on September 3, 2004, control room deficiencies list, and system operating procedure SPO-SD-01, "Work Control Process." In addition, the inspectors reviewed the work control and condition reporting programs to assess the openwork request tags and CRs for potential operator work-around consideration. The inspectors used OAP-45, "Operator Burden Program," Rev. 0 to evaluate plant deficiencies and their effects on plant operation.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope (71111.17 - 1 sample)

The inspectors reviewed the modification package ER-04-2-110, for the installation of a new fuel storage building (FSB) fuel handling bridge crane. This modification replaced the old manual crane with a new automated system for improved efficiency and ease of

operation. The inspectors reviewed the package to ensure that seismic concerns had been appropriately addressed, operating procedure changes had been identified and motor/cable ratings were of the proper lift capacity. The inspectors observed portions of the installation to ensure they conformed with the written procedures and also observed the installation of the seismic hold down brackets. The inspectors reviewed portions of the operating software code to verify the interlock scheme was adequate. The inspectors reviewed the site acceptance testing to verify it would ensure proper operation of the crane during fuel movement operations and that the required interlocks were verified to operate within the required tolerances.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope (71111.19 - 7 samples)

The inspector reviewed post-work test (PWT) procedures and associated testing activities to assess whether: 1) the effect of testing in the plant had been adequately addressed by control room personnel; 2) testing was adequate for the maintenance WO performed; 3) acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing documents; 4) test instrumentation had current calibrations, range, and accuracy for the application; and 5) test equipment was removed following testing.

The selected testing activities involved components that were risk significant as identified in the IP2 Individual Plant Examination (IPE). The regulatory references for the inspection included TSs and 10 CFR 50, Appendix B, Criterion XIV, "Inspection, Test, and Operating Status." The following testing activities were evaluated:

- PT-M58, "CCR Ventilation Area Radiation Monitors and Control," performed following completion of WO IP2-03-28318 on September 16, 2004;
- PT-W9, "R-27 10CFR21 Operability Test," performed following completion of WO No. IP2-03-25726 on September 16, 2004;
- PT-M99, "Effluent Radiation Monitor R-50 Source Check Test," performed following completion of WO IP2-03-28310 on September 16, 2004;
- WO IP2-03-24482, PWT on 23 CCW pump after maintenance on August 25, 2004;
- WO IP2-03-24950, PWT on 21 EDG after maintenance on August 11, 2004;
- WO IP2-02-31858, PWT on SI-MOV-850B after maintenance on its associated motor control center on July 8, 2004;
- WO IP2-04-26408, "Lower Right Hand Turbine Stop Valve," following use of mechanical jack to close valve on September 6, 2004

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activitiesa. Inspection Scope (71111.20 - 1 sample)

On September 15, 2004, the inspector observed new fuel receipt inspections in the FSB conducted by Entergy in preparation for the Fall 2004 IP2 refueling outage. The inspectors used NRC Inspection Procedure 71111.20, "Refueling and Other Outage Activities" for guidance and objectives associated with pre-outage activities. The inspector used the following references during the receipt inspections:

- IP-SMM-MP-124, "Fuel Assembly Receipt Inspection," rev. 2
- 0-REF-400-GEN, "New Fuel Receipt and Inspection," rev. 0

b. Findings

No findings of significance were identified.

1R22 Surveillance Testinga. Inspection Scope (71111.22 - 6 samples)

The inspector reviewed surveillance test procedures and observed testing activities to assess whether: 1) the test preconditioned the component tested; 2) the effect of the testing was adequately addressed in the control room; 3) the acceptance criteria demonstrated operational readiness consistent with design calculations and licensing documents; 4) the test equipment range and accuracy were adequate and the equipment was properly calibrated; 5) the test was performed per the procedure; 6) test equipment was removed following testing; and 7) test discrepancies were appropriately evaluated. The surveillance tests observed were based upon risk significant components as identified in the IP2 IPE. The regulatory requirements that provided the acceptance criteria for this review were 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," Criterion XIV, "Inspection, Test, and Operating Status," Criterion XI, "Test Control," and TS 6.8.1.a. The following test activities were reviewed:

- 2-SOP-1.7, "Reactor Coolant System Leakage," performed on July 13-15, 2004.
- PI-M2, "Containment Building Inspection," performed on August 3, 2004;
- PC-R52, "Auxiliary Feedwater Pump Room Environmental Qualified Temperature Switches," performed on August 17, 2004;
- 23 SI pump 850B MOV MCC performed on July 7, 2004;
- PT-Q28B, 22 RHR pump functional test on September 29, 2004
- PT-Q26F, 26 SW pump functional test performed on July 29, 2004

b. Findings

No findings of significance were identified.

1R23 Temporary Modificationsa. Inspection Scope (71111.23 - 1 sample)

The inspector reviewed temporary alteration (TA) -04-2-067, to defeat the FSB exhaust fan breaker control alarm (74/FSBEF) relay closed contact during the exhaust fan outage. This TA restored Panel SL, control room annunciator window 3-7 (fan room - fan auto trip) for the remaining operable fans. Work Order IP2-04-16799 installed the TA on April 5, 2004, and removed it on September 16, 2004. The inspector reviewed: 1) the individual TA control packages to ensure these plant modifications were performed in accordance with ENN DC-136, "Temporary Alterations," and 2) to ensure compliance with 10 CFR 50.59 screen-out evaluations associated with each of these modifications.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness1EP6 Drill Evaluationa. Inspection Scope (71114.06 - 1 sample)

The inspectors observed an emergency preparedness (EP) drill conducted on September 22, 2004. The inspectors used NRC Inspection Procedure 71114.06, "Drill Evaluation" as guidance and criteria for evaluation of the drill. The drill consisted of a security credible threat followed by a large break loss of coolant accident and failure of emergency core cooling systems. The drill also included use and implementation of the Severe Accident Control Room Guidelines for Technical Support Center (TSC) personnel. The inspectors observed the drill and conducted reviews from the participating facilities onsite, including the IP2 Plant Simulator, the TSC, and the Emergency Operations Facility (EOF). The inspectors focused the reviews on the identification of weaknesses and deficiencies in the classification, notification, and protective action recommendations performed by Entergy during the drill. The inspectors were briefed on Entergy's critique results and compared the NRC identified weaknesses and deficiencies to those identified by Entergy to ensure that problem areas were properly identified.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas

a. Inspection Scope (71121.01 - 7 samples)

During August 16-19, 2004, the inspector conducted the following activities to verify that Entergy was properly implementing physical, engineering, and administrative controls for access to high radiation areas (HRAs), and other radiologically controlled areas (RCAs), and that workers were adhering to these controls when working in these areas. Implementation of the access control program was reviewed against the criteria contained in 10 CFR 20, TSs, and Entergy's procedures.

- The inspector walked down the plant and verified that there were no posted airborne radioactivity areas or potential internal exposure accessible work areas >50 mrem committed effective dose equivalent (CEDE).
- Controls for the underwater storage of highly activated reactor components in the Unit 2 and Unit 3 spent fuel pools were examined by visual observations.
- Radiation Protection Audit No. QA-14-2004-IP-1, dated July 20, 2004, was reviewed.
- Four CRs were reviewed (see Section 4OA2.4), between April 2004 and August 2004, to ensure the radiation protection audit identified any repetitive deficiencies in the radiation protection program.
- During the previous four quarters, there were no PI incidents relative to the Occupational Radiation Safety Cornerstone.
- The following procedures for controlling access to HRAs, HRAs >1 rem/hr, and very high radiation areas were reviewed: O-RP-RWP-400, "RWP Preparation and ALARA Planning"; and O-RP-ACC-501, "Access Control for Radiological Areas."
- On August 16-18, 2004, utilizing the latest HRA checklist, the inspector walked down Units 1, 2 and 3 and verified the postings, barricades, and locked status of all the plant HRAs.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls

a. Inspection Scope (71121.02 - 2 samples)

During August 16-19, 2004, the inspector conducted the following activities to verify that Entergy was properly maintaining individual and collective radiation exposures as low as is reasonably achievable (ALARA). Implementation of the ALARA program was reviewed against the criteria contained in 10 CFR 20.1101(b) and Entergy's procedures.

- Procedure O-RP-RWP-400, Rev. 0, "RWP Preparation and ALARA Planning" was reviewed with respect to processes used to estimate, re-estimate, and track work activity exposures.
- ALARA work planning exposure estimates were reviewed for the upcoming Unit 2 Fall 2004 refueling outage. The five highest exposure outage tasks were identified as listed below.
 - Replace resistance temperature detectors (RTDs): 26.9 person-rem estimate
 - Reactor disassembly/reassembly: 25 person-rem estimate
 - Refurbish valves: 15 person-rem estimate
 - Reactor head insulation modification: 6.5 person-rem estimate
 - In-service inspection: 5.7 person-rem estimate

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

2PS1 Gaseous and Liquid Effluents

a. Inspection Scope (71122.01 - 10 samples)

The inspector reviewed the following documents to evaluate the effectiveness of Entergy's radioactive gaseous and liquid effluent control programs. The requirements for radioactive effluent controls are specified in the TSs and the Offsite Dose Calculation Manual (ODCM).

- The 2002 and 2003 Radioactive Effluent Release Reports were reviewed including projected public dose assessments. There were no abnormal results reported in these two reports. The current ODCM (Revision 8) was reviewed including technical justifications for any changes made since the previous revision. The inspector reviewed FSAR Sections 11.1 and 11.2, which describe the radioactive waste systems and radiation monitoring system (RMS).

- The inspector observed the following plant equipment and work activities to evaluate the effectiveness of Entergy's radioactive gaseous and liquid effluent control programs:
 - walkdown to determine the availability of radioactive liquid/gaseous effluent RMS and to determine the equipment material condition;
 - observation of sampling and laboratory measurement techniques; and
 - walkdown to determine the operability of air cleaning systems and to determine the equipment material condition.
- Four radioactive liquid waste batch release permits (Nos. 2004-27, 42, 44, and 49), and two radioactive gaseous release permits (Nos. 60 and 66) were selected and reviewed with respect to ODCM and procedural requirements.
- Two instances of effluent RMS unavailability were selected to verify implementation of the compensatory sampling and analysis program by validation that required effluent sampling and analysis was provided.
- Changes to the ODCM (Revision 8) were reviewed along with the technical justification for each change. No significant changes to the liquid or gaseous radioactive waste system design or operation were identified.
- Effluent release dose calculations were reviewed for 2003 and the first two quarters of 2004 with respect to TS/ODCM calculation methodology, and 10 CFR 50, Appendix I public dose requirements. The inspector verified the methods used and verified that no regulatory requirements were exceeded.
- The inspector reviewed the most recent air cleaning system filter surveillance test results required by TSs (visual inspection, pressure differential, laboratory charcoal efficiency test, and air flow capacity tests) for the following:
 - FSB filtration system;
 - central control room filtration system;
 - containment pressure relief filtration system; and
 - PAB filtration system.
- The inspector reviewed the most recent calibration results for the gaseous and liquid effluent RMS radiation monitors and associated flow rate measurement devices, as required by the ODCM for the following:
 - liquid radwaste effluent line (R-54);
 - steam generator blowdown effluent line (R-49);
 - condenser air ejector radiation monitor (R-45);
 - plant vent particulate and iodine radiation monitors (R-43, R-44);
 - plant vent wide range noble gas radiation monitor (R-27);
 - component cooling water radiation monitor(R-47);
 - component cooling SW HX no. 21 radiation monitor(R-39);

- component cooling SW HX no. 22 radiation monitor(R-40);
- containment fan cooler SW return radiation monitors (R-46, 53);
- waste gas decay tank radiation monitor (R-50);
- Unit 1 stack radiation monitor (R-60);
- Unit 1 liquid waste distillate radiation monitor (R-54); and
- Unit 1 sphere foundation sump liquid radiation monitor (R-62).

Effluent liquid and gas sample radiation measurement equipment calibrations were reviewed for currently in-use high purity germanium gamma spectrometers and liquid beta scintillation counters. Selected counting equipment quality control charts were reviewed that documented continued operability of this equipment.

- Implementation of the measurement laboratory quality control program was reviewed, including effluent intra-laboratory and inter-laboratory comparisons. The latest quality assurance (QA) audit, IPEC Quality Assurance Audit Report, A03-0141; and the IP2 Radiation Monitoring System Improvement Action Plan, March 11, 2004 self-assessment was also reviewed.
- The inspector also reviewed 26 CRs relative to the Indian Point Unit 2 Effluents Program, initiated between January 2003 and July 2004 (see Section 4OA2.3).

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope (71122.03 - 9 Samples)

The inspector reviewed: the most current Annual Environmental Monitoring Report (Annual Radiological Environmental Operating Report, Entergy Nuclear Northeast, Indian Point Units 1, 2, and 3, January 1 - December 31, 2003) and Entergy assessment results to verify that the REMP was implemented as required by TS and the ODCM and for changes to the ODCM with respect to environmental monitoring, commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, interlaboratory comparison program, and analysis of data; the ODCM (Unit 2, Revision 8; Unit 3, Revision 16) to identify environmental monitoring stations; Entergy self-assessments, audits, Licensee Event Reports (LERs), and interlaboratory comparison program results; the FSAR for information regarding the environmental monitoring program and meteorological monitoring instrumentation; and, the scope of Entergy's audit program to verify that it meets the requirements of 10 CFR 20.1101(c).

The inspector walked down 6 (of 9) air sampling stations; 1 (of 3) broadleaf vegetation location; 1 (of 2) rainwater collection location; and, 13 (of 41) thermoluminescence dosimeter (TLD) monitoring stations and determined that they were located as

described in the ODCM and determined the equipment material condition to be acceptable.

The inspector observed the collection and preparation of a variety of environmental samples (listed above) and verified that environmental sampling was representative of the release pathways as specified in the ODCM and that sampling techniques were in accordance with procedures.

Based on direct observation and review of records, the inspector verified that the meteorological instruments were operable, calibrated, and maintained in accordance with guidance contained in the FSAR, NRC Safety Guide 23, and Entergy procedures. The inspector verified that the meteorological data readout and recording instruments in the control room and at the tower were operable.

The inspector reviewed each event documented in the Annual Environmental Monitoring Report which involved a missed sample, inoperable sampler, lost TLD, or anomalous measurement for the cause and corrective actions. The inspector conducted a review of Entergy's assessment of any positive sample results.

The inspector reviewed any significant changes made by Entergy to the ODCM as the result of changes to the land census or sampler station modifications since the last inspection. The inspector also reviewed technical justifications for any changed sampling locations and verified that Entergy performed the reviews required to ensure that the changes did not affect its ability to monitor the impacts of radioactive effluent releases on the environment.

The inspector reviewed the calibration and maintenance records for all air samplers. The inspector reviewed: the results of Entergy's contractor interlaboratory comparison program to verify the adequacy of environmental sample analyses performed by Entergy's contractor; Entergy's quality control evaluation of the interlaboratory comparison program and the corrective actions for any deficiencies; Entergy's determination of any bias to the data and the overall effect on the REMP; and QA audit results of the program to determine whether Entergy met the TS/ODCM requirements. The inspector verified that the appropriate detection sensitivities with respect to TS/ODCM were utilized for counting samples and reviewed the results of the vendor's quality control program including the interlaboratory comparison program to verify the adequacy of the vendor's program.

The inspector observed several locations where Entergy monitors potentially contaminated material leaving the RCA, and inspected the methods used for control, survey, and release from these areas, including observing the performance of personnel surveying and releasing material for unrestricted use verifying that the work was performed in accordance with plant procedures.

The inspector verified that the radiation monitoring instrumentation was appropriate for the radiation types present and was calibrated with appropriate radiation sources. The inspector reviewed Entergy's criteria for the survey and release of potentially

contaminated material; verified that there was guidance on how to respond to an alarm which indicates the presence of licensed radioactive material; and reviewed Entergy's equipment to ensure the radiation detection sensitivities were consistent with the NRC guidance contained in IE Circular 81-07 and IE Information Notice 85-92 for surface contamination and HPPOS-221 for volumetrically contaminated material (SMM-RP-801, Rev. 0, "Radiological Control of Volumetric Material"; RE-CON-3-4, Rev. 11, "Release of Material from the Radiologically Controlled Area"; O-RP-RMC-800, Rev. 0, "Release of Equipment and Materials from the Radiologically Controlled Area"). The inspector also reviewed Entergy's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters and verified that Entergy had not established a "release limit" by altering the instrument's typical sensitivity through such methods as raising the energy discriminator level or locating the instrument in a high radiation background area.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope (71151 - 1 sample)

The inspector reviewed Entergy's PI data for the Safety System Functional Failure indicator to verify whether the data was accurate and complete. The inspector compared the PI data reported by Entergy to information from LERs for four quarters from the 3rd quarter of 2003 to the 1st quarter of 2004. In addition, the inspectors compared the PI data against the guidance in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Rev. 2.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

1. Daily Review

a. Inspection Scope (71152)

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive failures or specific human performance issues for follow-up, the inspectors screened all items entered into Entergy's CAP. This review was accomplished by reviewing hard copies of each CR.

b. Findings

No findings of significance were identified.

2. PI&R Annual Sample - Design Basis Document Update Weaknesses

a. Inspection Scope (71152 - 1 sample)

The inspectors selected CR-IP2-2003-04245, which identified design basis document update weaknesses, for detailed review. The weakness was related to missequencing CR corrective actions such that there were instances where the appropriate design basis document change request form (i.e., the Pending Change Form, or PCN) was not properly completed in a timely fashion. Specifically, CR evaluations were closed, but the associated PCN were not completed (which would include the proposed document change). Rather, the CR could have been closed to the PCN process, and as a consequence, this missequencing can and has led to untimely updates of design basis documents. The inspectors reviewed CR-IP2-2003-04245, interviewed personnel, and reviewed associated documents to ensure that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified, prioritized, and implemented. The inspectors evaluated these items against the requirements of Entergy's CAP as delineated in EN-LI-102, "Corrective Action Process."

b. Findings

No findings of significance were identified.

The inspectors found that Entergy revised the design basis document change process to specify that a CR cannot be closed until the associated PCN or other controlling change document has been prepared and implemented. This process is described in procedures ENN-DC-152, "Preparation, Revision, Review, and Approval of Design Basis Documents," and ENN-LI-102, "Corrective Action Process." As identified in their followup to CR-IP2-2003-04245, Entergy reviewed the design basis document open items (pending changes) for safety significance and prioritized the items for closure. In addition, Entergy recently identified and documented in another CR (CR-IP2-2004-04323) that a review of design basis documents still indicated a need to improve system configuration because of numerous open CRs and design basis document open items. The response in this CR indicated that the remaining open items would be closed as part of the existing Design Basis Improvement Project in 2005. The inspectors independently reviewed a sample of design basis document change requests to assess the significance and priority assigned to the items for resolution, and did not identify deficiencies.

3. PI&R Annual Sample - Loss of Instrument Air to Containment

a. Inspection Scope (71152 - 1 sample)

The inspectors selected CR-IP2-2003-07152, "Loss of Instrument Air to Containment," for review to ensure that the root and contributing causes of the issue were adequately understood and the associated corrective actions were appropriate to prevent recurrence. The root cause analysis report was evaluated to verify that all aspects of the event were properly understood and that the recommendations were properly implemented in the CAP. In addition, the inspectors reviewed engineering request IP2-04-1372 that evaluated a modification to separate the electrical circuits for two containment valves associated with this event. The inspectors also reviewed operator training BET-C-042 which was provided to the operations crew as part of the corrective actions.

b. Findings

No findings of significance were identified.

The inspectors noted that the modification to enhance the electrical circuits for the containment isolation valves associated with this event is not planned for implementation until the 2006 refueling outage. While this enhancement is not required to meet regulatory requirements, its purpose was to remove an identified human performance trap. The inspectors determined that while the fuse labeling and operator training was adequate to address the problem, the modification would have provided a more robust action to ensure the event was not repeated.

4. PI&R Annual Sample - Emergency Preparedness

a. Inspection Scope (71152 - 1 sample)

The inspector reviewed Entergy's processes for identification and resolution of issues under the purview of the EP program. The inspector focused on the operation, maintenance, programmatic controls, and corrective actions associated with the alert and notification system (ANS). Reasons for actual and indicated siren failures for 2004 were reviewed to identify adverse trends. Included in these reviews were investigations into the potential impact of degraded grid voltage on the siren system. Also, siren outage and maintenance data was reviewed to assess the timeliness and effectiveness of Entergy repairs and maintenance. The inspector reviewed activities associated with the outage of the primary meteorological tower just prior to the June 8, 2004 full-participation exercise. Also, the inspector reviewed the purpose, status, and planned actions for the local government radio (LGR) and its role in emergency communications. The inspector reviewed documentation and conducted interviews to accomplish this inspection. The planning standard 10 CFR 50.47(b)(5) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

b. Findings

No findings of significance were identified.

The inspector viewed a demonstration of the siren activation and feedback system. Results from previous tests, archived within the system, were reviewed to verify the announced results. Entergy had developed criteria from among the monitored siren parameters to determine a “satisfactory” or “unsatisfactory” test result. Inputs for a siren “unsatisfactory” test result is: power, starter, communications, audio, and rotation. These criteria, although reasonable, were selected without input from the end-users (the counties). The main display screen of the feedback system was changed from its original format which displayed all parameters to format displaying either “satisfactory” or “unsatisfactory” results. The detailed information regarding individual siren performance was still available through the feedback system but on a sub-menu from the main display. Training was provided on this change and the lesson plans appeared acceptable.

Indicated “false” failures, reported by the feedback system during tests, continue to occur although at a lower rate than in 2003 when the new system was tested. The primary cause of indicated “false” failures are rotation sensors which are impacted by debris, specifically bird nests. Past Entergy attempts to solve this issue have not been fully effective. Although false indicated rotation failures are declining, more needs to be done than using bird repellent and increased monitoring of sirens that have been prone to nesting. Entergy was assessing a design change to the sirens that will prevent bird nests. The false indications would cause the counties to expend resources to perform route alerting in those areas; however, those sirens would fulfill their intended function of notifying the public. Although permitted by NRC guidance, Entergy did not count these indicated “false” failures as failed tests in the ANS PI because, after a further review of other feedback data, they determined that these sirens fulfilled their function to notify the public. Due to the design of the sirens, if a siren is sounding as indicated by the audio sensor, then the siren is rotating. Thus, Entergy can justify that the siren was functioning.

The inspector determined that repair and maintenance of the sirens was acceptable and there were only isolated instances of prolonged siren outages. The prolonged outages did not appear to be excessive given the nature of the problem, the coordination efforts needed with outside entities (i.e., local utilities) to restore the sirens, and to some extent, the weather. Repairs and maintenance performed on the sirens appear effective as there have been no repeats of identical component failures aside from the rotation sensors.

Component problems with the sirens appear to be addressed appropriately. Some problems have been caused by issues beyond Entergy’s control such as local utility work or power distribution component issues (i.e., local transformers). While reviewing corrective actions to siren failures for the June 15, 2004 test; one initial assessment by Entergy stated that degraded voltage on the grid due to warm weather (and the time of day when the test occurred) may have contributed to the failures. Subsequent to that

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initial preliminary assessment, Entergy had determined that the siren failures were due to component issues. Entergy analyzed for degraded voltage condition impact on siren performance, and concluded that, under the most adverse grid condition in which end-user voltages would be dropped, the sirens could operate although they would just be within their operating limits.

Communications between Entergy and the counties regarding the status of the siren could be improved. Entergy communicates siren status to the counties (for the purpose of conducting route alerting in the event of an emergency) via daily status reports which are sent to various county representatives. However, some reports from earlier this year were confusing unless one had regularly followed the status reports. Entergy recognized this and was working toward an improved status/communication format. However, it should be noted that in the daily status reports, Entergy informs the counties if an inoperable siren would require route alerting. Using data from the original ANS design, some siren outages would not require route alerting due to overlap from adjacent sirens. This data appears to have been developed to support FEMA-REP-10, Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants, Section E.6.2.4.6, Use of Police Fire, or Rescue Vehicles and Personnel.

The outage of the primary meteorological tower on June 1, 2004, was due to a lightning strike. A swap over of data to the backup tower should have occurred. However, questions about the data after the lightning strike were not clearly communicated nor actively pursued until just prior to the exercise when the problem with the meteorological data was understood. The system that sends data to the end-users was transmitting erroneous stability class information due to a configuration of the system. It was still reading stability class from the inoperable primary tower instead of the backup. Once understood, Entergy took necessary action to provide reliable meteorological data to offsite agencies from the backup meteorological tower. Entergy acknowledged that their response to early indications of meteorological data discrepancies did not meet their expectations.

The LGR serves as a backup communication method for Entergy to make emergency notifications to offsite agencies. There are no concerns or issues regarding the ability of the LGR to function in that capacity. The LGR is a New York State communication system. Due to the terrain around the Indian Point site, this radio system will not permit reliable communications among the various offsite agencies. Although outside of NRC requirements and the commitments of Entergy's emergency plan, Entergy provided a repeater to upgrade the LGR system to permit interagency communication for the surrounding offsite agencies.

5. PI&R RP Sample - Public Radiation Safety
 - a. Inspection Scope (71122.01 & 71122.03 - 2 Samples)

The inspector reviewed Entergy's LERs, Special Reports, and audits (Audit Report A03- 11-I, IPEC Radiological Environmental and Meteorological Monitoring Program) related to the REMP performed since the last inspection. The inspector determined that

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identified problems were entered into the CAP for resolution. The inspector also reviewed corrective action reports affecting environmental sampling, sample analysis, or meteorological monitoring instrumentation. Two CRs related to the problems identified in the REMP during the audit were reviewed (CR-IP3-2003-04799 and CR-IP3-2003-04800).

The inspector reviewed 26 CRs initiated between January 2003 and July 2004, relative to the radioactive liquid and gaseous radioactive effluent control program. The inspector verified that problems identified by these CRs were properly characterized in Entergy's event reporting system, and that applicable causes and corrective actions were identified commensurate with the safety significance of the occurrences.

b. Findings

No findings of significance were identified.

6. PI&R RP Sample - Occupational Radiation Safety

b. Inspection Scope (71121.01 - 1 sample)

The inspector reviewed the following corrective action CRs that were initiated between April 2004 and August 2004 and were associated with the radiation protection program: CR-IP2-2004-1567, CR-IP2-2004-2514, CR-IP3-2004-2664, and CR-IP2-2004-3556. The inspector verified that problems identified by these CRs were properly characterized in Entergy's event reporting system, and that applicable causes and corrective actions were identified commensurate with the safety significance of the radiological occurrences.

b. Findings

No findings of significance were identified.

40A4 Cross Cutting Aspects of Findings

Section 1R13 described two findings of inadequate causal analysis to identify the cause of the manual reactor trip on September 1, 2004, and inadequate corrective actions associated with a solenoid operated valve on the 23 FWRV. These findings were determined to be associated with the cross-cutting area of PI&R.

40A6 Meetings, Including Exit

On October 14, 2004, the inspectors presented the preliminary inspection results to Mr. F. Dacimo and other Entergy staff members. No proprietary information was presented in this report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

W. Axelson, Radiological Engineering Supervisor
T. Barry, Security Superintendent
T. Beasley, System Engineering
F. Bloise, PI-10 Project Manager
T. Burns, NEM/Respiratory Protection Supervisor
R. Christman, Supervisor, Nuclear Operator Training
P. Conroy, Licensing Manager
F. Dacimo, Site Vice President
G. Dahl, Senior Licensing Engineer
R. DeCensi, Technical Support Manager and Radiation Protection Manager
R. Deschamps, Radiation Protection Coordinator
A. Eng, Licensing, White Plains
C. English, Unit 1 Project Coordinator
D. Gainer, Risk Analyst
D. Gately, Assistant Radiation Protection Manager
D. Gray, Environmental Engineer
P. Gropp, Manager DBI Project
G. Hocking, Instruments and Dosimetry Supervisor
F. Inzirillo, EP Manager
T. Jones, Nuclear Safety/Licensing Specialist, Licensing
M. Kerns, Chemistry Manager
R. LaVera, ALARA Supervisor
L. Lee, System Engineering Supervisor, Support Systems
D. Mayer, Unit 1 Project Manager
T. McCaffrey, Manager of System Engineering
B. McGuire, Contractor/Investigator, VPA Corporation
R. Milici, Senior Engineer, Electrical Design Engineering
K. Naku, Unit 2 Instrumentation and Controls Assistant Superintendent
J. O'Driscoll, System Engineer (CCW)
D. Pace, Vice President - Engineering Northeast
J. Peters, Unit 2 Plant Chemist
S. Petrosi, Manager, Design Engineering
F. Philips, Emergency Planner
J. Raffaele, Design Engineering Supervisor - Electrical
R. Robenstein, Simulator Support Leader
B. Rokes, Senior Licensing Engineer
A. Singer, Supervisor, Nuclear Operator Requalification Training
R. Sutton, MR Coordinator
J. Toscano, System Engineering
J. Tuohy, Manager Engineering Support
M. Vasely, Engineering Supervisor

R. Walpole, Nuclear Manager
C. Wend, Radiation Protection Superintendent
D. Wilson, Chemistry Assistant Superintendent
B. Young, Senior Mechanical Engineer

Emergency Preparedness
Other Personnel Contacted

R. Albanese, Four County Coordinator
N. Sweeney, Westchester County

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened/Closed

50-247/04-08-01	FIN	Inadequate causal analysis for 22 feedwater regulating valve (Section 1R13.1)
50-247/04-08-02	FIN	Failure to promptly identify degraded conditions associated the 23 feedwater regulating valve (Section 1R13.2)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

OAP-008, "Seasonal Weather Preparations," Rev. 0

Section 1R04: Equipment Alignment

TS 3.7.11

TS Amendment No. 211 dated July 27, 2000

Background document for 2-AOP-FH-1, "Fuel Damage or Loss of SFP/Refueling Cavity Level"

Section 1R05: Fire Protection

Fire Protection Implementation Plan

Pre-Fire Plan

Station Administrative Order (SAO)-700, "Fire Protection and Prevention Policy"

SAO-703, "Fire Protection Impairment Criteria and Surveillance"

Calculation PGI-00433, "Combustible Loading Calculation"

CR-IP2-2004-03113

Fire Hazards Analysis DC-85-101 Zone 43A
Fire Hazards Analysis Exemption Request 13
SMM-DC-901, "IPEC Fire Protection Program Plan," Rev. 1
ENN-DC-127, "Control of Hot Work and Ignition Sources," Rev. 1
ENN-DC-161, "Transient Combustible Program," Rev. 1
IP-EP-AD13, "IPEC Emergency Plan Administrative Procedures," Rev. 0

Section 1R06: Flood Protection Measures

Condition Reports: IP2-2004-04249, IP2-2003-06975, and IP2-2003-6065
2-AOP-FLOOD-1, "Flooding," Rev. 0
OAP-008, "Severe Weather Preparations," Rev. 0

Section 1R11: Operator Requalification Inspection

IPEC Lesson Plan SES-ES-1.2, "Pressurizer Pressure Master Controller Failure, RCP HI Vibrations, RCP Seal Leak, Small LOCA"

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

Procedures

SPO-SD-09, "On-Line Risk Assessment Process," Rev. 0
Maintenance Procedure VCK-B-007-N, "Maintenance Procedure for 20 inch Crane/Chapman Model 973 Tilting Disc Check Valves - Non-Class "A""
ER No. 04-2-179, ER Response titled "Installation of Hot Tap Blind Tee in 21 BFD Suction Line"
ENN-OP-104, Rev. 2, Operability Evaluation for CR-IP2-2004-04354, Check Valve BFD-1

Drawings

M-131736, "Model D-100-160-2.5 Operator Valve Assembly"
D260507-06, "Loop Diagram of 22 Narrow Range Level"
9321-F-2019-110, "Boiler Feedwater System"

Calculation

IP-CALC-04-01148, "Evaluation of Supports CD-66 and CD-67 for Installation of Hot Tap"

Work Orders

IP2-04-26427
IP2-97-88547
IP2-01-3313
BFD-1 WO History since 1988
Work Step List Main Boiler Feedwater Pump 21
WO 97-88547, Investigate Feedwater Regulating Valve

Condition Reports

IP2-2004-04141
IP2-2004-04291
IP2-2001-08263
IP2-2003-06614
IP2-2004-04071

Section 1R14: Personnel Performance During Non-routine Plant Evolutions and Events

Procedures

IP-SMM-LI-108, "Reportability"
Sequence of Event Log
IP-SMM-OP-105, Post Transient Evaluations (September 1 and 24 Reactor Trips)
E-0, "Reactor Trip or Safety Injection"
E-0.1, "Reactor Trip Response"
Event Recollection Forms

Condition Reports

CR-IP2-2004-04043
CR-IP2-2004-04063
CR-IP2-2003-04935
CR-IP2-2004-4051

Operability

Indian Point Unit 2 Piping and Support Operability Program

Event Notification Worksheet

EN 41003, September 1, 2004 Manual Reactor Trip
EN 41066, September 24, Manual Reactor Trip

Section 1R15: Operability Evaluations

Design Basis Document for Isolation Valve Seal Water System
CR IP2-2004-03462
Emergency Operating Procedure E-1, "Loss of Reactor or Secondary Coolant," Rev.40
Emergency Operating Procedure E-0, "Reactor Trip or Safety Injection," Rev. 41

Section 1R22: Surveillance Testing

Radiation Work Permit 042028, revision 4, "Non-Outage Vapor Containment Entries All Groups"
PI-M2, "Containment Building Inspection," performed on July 7, 2004
CR IP2-2004-03151 and 03152

WO IP2-04-12191, IP2-02-31858, IP2-03-23457
Procedure MOV-P-040-A
Operator logs, 24hrs of 9/7/04

Section 1EP6: Emergency Plan Drill

0-AOP-SEC-1, "Response to Security Compromise," Rev. 1
IP-EP-120, "Emergency Classifications," Rev. 0
IP-EP-130, "Emergency Notification and Mobilization," Rev. 2
IP-EP-430, "Site Assembly, Accountability and Relocation of Personnel Offsite," Rev. 1
IP-EP-220, "Technical Support Center," Rev. 0
IP-EP-250, "Emergency Operations Facility," Rev. 3
IP-EP-230, "Operations Support Center," Rev. 0
CRs: IP3-2004-03291, IP3-2004-03292, IP3-2004-03293, IP3-2004-03294, IP3-2004-03304, IP3-2004-03310
Entergy Nuclear Northeast Indian Point Energy Center, Unit 2, September 22, 2004 Drill Scenario

Section 2PS1: Radiation Safety

Condition Reports

CR-IP2-2003-541	CR-IP2-2003-4434	CR-IP2-2004-713
CR-IP2-2003-1462	CR-IP2-2003-4519	CR-IP2-2003-931
CR-IP2-2003-1589	CR-IP2-2003-6273	CR-IP2-2004-1973
CR-IP2-2003-1729	CR-IP2-2003-6374	CR-IP2-2003-1992
CR-IP2-2003-1912	CR-IP2-2003-6971	CR-IP2-2003-2309
CR-IP2-2003-3203	CR-IP2-2003-4997	CR-IP2-2003-2528
CR-IP2-2003-4078	CR-IP2-2003-5179	CR-IP2-2004-3006
CR-IP2-2003-4416	CR-IP2-2003-5296	CR-IP2-2004-3245
CR-IP2-2004-2775	CR-IP2-2003-1792	

Section 2PS3: Public Safety

Annual Radiological Environmental Operating Report, Entergy Nuclear Northeast, Indian Point Units 1, 2, and 3, January 1 - December 31, 2003
Indian Point Unit 2 Off-Site Dose Calculation Manual, Rev. 8
Indian Point Unit 3 Off-Site Dose Calculation Manual, Rev. 16
Procedures: SMM-RP-801, Rev. 0, "Radiological Control of Volumetric Material"
RE-CON-3-4, Rev. 11, "Release of Material from the Radiologically Controlled Area"
O-RP-RMC-800, Rev. 0, "Release of Equipment and Materials from the Radiologically Controlled Area"
CRs: IP3-2003-04799 and IP3-2003-04800

Section 4OA2: Problem Identification and Resolution

Activation Results for the 6/15/04 Siren Test
Activation Results for the 9/15/04 Siren Test

Emergency Siren System Training Material, December 2003
 Indian Point Siren System Maintenance Manual
 Purchase Order 4500531974
 Siren System Availability Study
 CR-IP2-2004-02569
 CR-IP2-2004-02578
 CR-IP2-2004-03185

LIST OF ACRONYMS

AFW	auxiliary feedwater
ALARA	As Low As is Reasonably Achievable
ANS	alert and notification system
AOP	abnormal operating procedure
CAP	corrective action program
CCW	component cooling water
CEDE	committed effective dose equivalent
CFR	Code of Federal Regulation
COL	check off list
CR	condition report
EDG	emergency diesel generator
EOF	emergency operations facility
EOP	emergency operating procedure
EP	emergency preparedness
FSAR	Final Safety Analysis Report
FSB	fuel storage building
FW	feedwater
FWRV	feedwater regulating valve
GT	gas turbine
HRA	high radiation area
HX	heat exchanger
IMC	inspection manual chapter
IP2	Indian Point Unit 2
IPEC	Indian Point Energy Center
IPE	Individual Plant Examination
IPEEE	Individual Plant Examination for External Events
ITS	Improve Technical Specifications
JPM	job performance measures
JW	jacket water
LER	Licensee Event Report
LGR	local government radio
LOCA	loss-of-coolant accident
MFW	main feedwater
MR	Maintenance Rule
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission

OA	other activities
ODCM	Offsite Dose Calculation Manual
OS	occupational radiation safety
PAB	primary auxiliary building
PI	performance indicator
PI&R	problem identification and resolution
PWR	pressurized water reactor
PWT	post work test
QA	Quality Assurance
RCA	Radiologically Controlled Area
RCS	reactor coolant system
REMP	Radiological Environmental Monitoring Program
RHR	residual heat removal
RMS	radiation monitoring system
RPS	reactor protection system
RTD	resistance temperature detector
RWP	radiation work permit
SAO	station administrative orders
SCBA	self-contained breathing apparatus
SDP	significance determination process
SI	safety injection
SOP	system operating procedure
SW	service water
TA	temporary alteration
TLD	Thermoluminescent dosimeter
TS	Technical Specification
TSC	Technical Support Center
WO	work order