

June 12, 2002

Mr. Fred Dacimo  
Vice President - Operations  
Entergy Nuclear Operations, Inc.  
Indian Point Nuclear Generating Units 1 & 2  
295 Broadway, Suite 1  
Post Office Box 249  
Buchanan, NY 10511-0249

**SUBJECT: INDIAN POINT 2 - NRC INSPECTION REPORT 50-247/02-03**

Dear Mr. Dacimo:

On May 11, 2002, the NRC completed an inspection at the Indian Point 2 Nuclear Power Plant. The enclosed report presents the results of that inspection. The results were discussed on May 16, 2002, with you and members of your staff.

The inspection was an examination of 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 inspection also reviewed the occupational radiation safety areas. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories, and although the specific actions are not releasable to the public, they generally include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of your response to these advisories and your ability to respond to terrorist attacks with the capabilities of the current design basis threat (DBT). On February 25, 2002, the NRC issued an Order to all nuclear power plant licensees, requiring them to take certain additional interim compensatory measures to address the generalized high-level threat environment. With the issuance of the Order, we will evaluate Entergy's compliance with these interim requirements.

Based on the results of this inspection, two violations of NRC requirements were identified related to operator procedural adherence and emergency planning procedure effectiveness associated with on-site accountability. However, because of the very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as Non-cited violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these Non-cited violations, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear

Mr. Fred Dacimo

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Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Indian Point 2 Nuclear Power Plant.

In accordance with 10 CFR 2.790 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). Should you have any questions regarding this report, please contact Mr. Peter Eselgroth at 610-337-5234.

Sincerely,

/RA/

Brian E. Holian, Deputy Director  
Division of Reactor Projects

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

Enclosure: Inspection Report 50-247/02-03

Attachment 1 - Supplemental Information

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Mr. Fred Dacimo

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No. 50-247

License No. DPR-26

Report No. 50-247/02-03

Licensee: Entergy Nuclear Operations, Inc..

Facility: Indian Point 2 Nuclear Power Plant

Location: Buchanan, New York 10511

Dates: March 31 - May 11, 2002

Inspectors: Peter Habighorst, Senior Resident Inspector  
Lois James, Resident Inspector  
William Raymond, Senior Resident Inspector, Pilgrim  
G. Scott Barber, Senior Project Engineer  
Stephen Pindale, Senior Reactor Inspector (April 22-May 2 in-office review)  
John R. McFadden, PhD, Health Physicist

Approved by: Peter W. Eselgroth, Chief  
Projects Branch 2  
Division of Reactor Projects

## SUMMARY OF FINDINGS

IR 05000247-02-03, on 3/31-5/11/2002, Entergy Nuclear Operations, Inc.; Indian Point 2 Nuclear Power Plant. Initiating Events, Barrier Integrity, Emergency Preparedness, and Cross Cutting Issues.

The report covered a 6 week period of inspection by resident and region-based inspectors. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/reactors/operating/oversight.html>.

### **Cornerstone:** Initiating Events

Green. On April 20, 2002, and on May 8, 2002, the control room operators reduced plant power due to condensate pump motor failures. A lack of a predictive maintenance program and an improperly set oil level indication system were the causes for two separate condensate motor failures. The events are more than minor since both events increased the likelihood of an initiating event. Operator response was necessary to ensure an automatic reactor trip did not occur due to a low steam generator level. The performance issues were of very low safety significance since there was no impact to normally available mitigating equipment.

### **Cornerstone:** Barrier Integrity

Green. On April 11, 2002, operators did not complete a timely operability evaluation for containment isolation valve 869B after the disconnect switch operating handle on motor control center (MCC)26BB broke while applying an equipment tagout. At the time, the operators neither verified that the disconnect would operate nor completed an adequate evaluation regarding the ability to close valve 869B to perform its containment isolation function. An operability evaluation was completed about six hours later by a different operating crew and the operators then entered a four hour limiting condition for operation and isolated the containment penetration per the technical specifications 3.6.A.3.a.2.b. The untimely operability evaluation increased the unavailability time for the containment spray system. The inoperable containment isolation valve issue was more than minor because it impacts the containment barrier. This issue had very low safety significance since the containment isolation valve was repaired and restored to an operable status prior to exceeding technical specification 3.6.A.3.a.2.d. This issue was an example of untimely operator implementation of technical specification requirements in response to degraded safety equipment.

### **Cornerstone:** Emergency Preparedness

No Color. On March 6, 2002, the licensee implemented changes to the accountability process that decreased the effectiveness of the Emergency Plan (E-Plan). The finding was considered more than minor because, if left uncorrected, it would become a more significant safety concern. Changing commitments in the E-Plan without prior approval impacts the NRC's ability to perform its regulatory function and potentially creates an ineffective response to a radiological emergency. The consequences of this change were minimal because it did not preclude the function of accountability from being performed, albeit delayed. The licensee has implemented the corrective actions and has since met the timeliness goal. This change which

## Summary of Findings (cont'd)

decreased the effectiveness of the Plan is being treated as a non-cited violation consistent with Section VI.A of the Enforcement Policy, issued May 1, 2000 (65 FR 25388).

### **Cross-Cutting Issue**

**No Color.** On April 20, 2002, during a trip of one of the three condensate pumps, control room operators took incorrect action based on an abnormal operating instruction (AOI 21.1.1, "Loss of Feedwater") knowledge deficiency. Operators misapplied AOI 21.1.1 step 5.6.4, by using a suction pressure number from this step that did not apply which resulted in their taking operator actions resulting in an unnecessary power transient. A May 8, 2002, condensate pump trip exemplified that this transient (a rapid down power) was not necessary to restore feedwater pump suction.

The issue was more than minor since operator improper procedure usage is considered a precursor to a more significant event. Operator knowledge and skill performance issues have been captured in a number of individual NRC findings in past reports. Examples include operator re-qualification simulator test failures in September, 2001 (reference NRC report 50-247/2001-013), and an overpower condition in August, 2001 (reference NRC report 50-247/2001-09). The operator performance issues associated with the condensate pump trip were documented in the corrective action system as CRs 200204180 and 200204183. Improper AOI 21.1.1 procedure usage was a violation of Technical Specification 6.8.1.a. This is being treated as a Non-cited violation.

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## Report Details

### **SUMMARY OF PLANT STATUS**

The plant operated at full power during the inspection period, except for power decreases on April 20 and May 8 due to condensate pump motor failures. (See 1R14)

#### **1. REACTOR SAFETY (Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity)**

##### 1R05 Fire Protection

###### a. Inspection Scope (71111.05Q)

The inspector toured the areas important to plant safety and risk based upon a review of Section 4.0, "Internal Fires Analysis," and Table 4.6-2, "Summary of Core Damage Frequency Contributions from Fire Zones," in the Indian Point 2 Individual Plant Examination for External Events (IPEEE). The inspector evaluated conditions related to (1) licensee 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. The areas reviewed were:

- Fire Zones 1,2, and 2A, Primary Auxiliary Building 68 foot elevation
- Fire Zones 24, 12, 13; 21, 22, 24 Battery Rooms
- Fire Zone 11; Cable Spreading Room

Reference material consulted by the inspector included the Fire Protection Implementation Plan, Pre-Fire Plan, and Station Administrative Orders (SAOs)-700, "Fire Protection and Prevention Policy," SAO-701, "Control of Combustibles and Transient Fire Load," SAO-703, "Fire Protection Impairment Criteria and Surveillance," and Calculation PGI-00433, "Combustible Loading Calculation."

###### b. Issues and Findings

No significant findings were identified.

##### 1R07 Heat Sink Performance

###### a. Inspection Scope (71111.07B)

The inspector verified that the licensee's processes and programs were adequate to ensure proper heat exchanger performance for the following heat exchangers:

- component cooling water (CCW) heat exchangers;
- emergency diesel generator (EDG) jacket water and lube oil coolers; and
- containment fan cooling units (FCUs).

The methods (inspection, cleaning, performance monitoring and testing) used to ensure heat removal capabilities for the selected components were reviewed and compared to

commitments made in the licensee's response to NRC Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment."

The inspector reviewed heat exchanger thermal performance testing and preventive maintenance (PM) activities (i.e., inspection, cleaning, tube bundle replacement) with the responsible engineering and maintenance personnel to ensure that the techniques were consistent with the expected degradation trends. The inspector reviewed completed test and PM records to verify that the results were recorded and evaluated to ensure proper heat exchanger operation.

Design basis parameters and assumptions, such as tube plugging limits and vendor information, were reviewed to verify that heat exchanger PM and maintenance procedures incorporated the appropriate information. The inspector reviewed the system and performance engineers' monitoring and trending of key heat exchanger parameters used to assess heat exchanger performance.

The inspector reviewed a sample of corrective action system condition reports related to the selected equipment and programs to verify that identified problems were appropriately resolved. The inspector also conducted a walkdown of the selected heat exchangers in order to assess material condition.

b. Issues and Findings

No significant findings were identified.

1R11 Licensed Operator Requalification Program

Background

In response to a Yellow finding based on crew high failure rate (details of that inspection are discussed further in NRC Inspection Report 50-247/2001-013), the NRC evaluated operators who had been remediated following the requalification exam failures, and prior to returning them to shift duties. The licensee informed the NRC that they intended to complete this evaluation for three such operators. An inspector observed the operator performance during facility-administered scenarios.

a. Inspection Scope (71111.11)

On April 25, 2002, the inspector observed the performance of a staff crew during scenarios ESR-022-04 and ESR-022-09. The inspector verified that the scenarios met the attributes outlined in Attachment 11 of Inspection Procedure 71111. The training staff administered both scenarios and evaluated operator performance. During the scenarios, the operators were assigned to the role of Shift Manager, Watch Engineer or Control Room Supervisor. The operators passed the evaluations and the inspector's evaluation agreed with the facility evaluation.

The inspector also observed the conduct of simulator exams conducted on April 25, 2002, per scenarios ESR-022-04 and ESR-022-09 for an operating shift crew. The inspection was conducted to assess the adequacy of the training, licensed operator

performance, emergency plan implementation, and the adequacy of the licensee's critique. The inspector verified that the licensee critique was thorough, identified areas for improvement, and reinforced management expectations regarding operator competencies in the areas of procedure use, communications and peer checking.

b. Issues and Findings

No significant findings were identified.

.2 Enhanced Monitoring of Control Room Activities

a. Inspection Scope (71111.20, 71715)

The inspectors continued the implementation of an augmented inspection plan to permit long-term, heightened observation of control room activities and operator performance. The augmented inspection used resident and region-based inspectors. The inspectors monitored control room activities to verify operators, control room supervision and shift managers remained cognizant of plant conditions and work activities in the field. The inspectors verified the shift mentors were involved and interacted with the crews to provide real time feedback on performance and management expectations.

The inspectors confirmed the plant was operated safely and that the conduct of operations was generally in conformance with licensee administrative requirements. The inspectors verified the operators followed alarm response and operating procedures. Shift logs were reviewed to confirm the operators properly responded to equipment problems and documented control room activities. Inspector observations of performance deficiencies having minor safety significance were discussed with licensee management.

b. Issues and Findings

No significant findings were identified.

1R12 Maintenance Rule Implementation

a. Inspection Scope (71111.12)

The inspector reviewed risk significant equipment problems that were associated with safety related cranes and monorails in 2001. The inspector reviewed licensee follow-up actions to assess the effectiveness of maintenance activities. Issues selected for review included licensee identification of any functional failures, maintenance preventable functional failures, and repetitive failures as well as problem identification and resolution of any maintenance related issues. The inspector also reviewed system availability, system reliability monitoring, and system engineering involvement. The inspector reviewed the maintenance rule basis document for cranes and monorails. The following issues were reviewed:

<u>Report No.</u>	<u>Condition Description</u>
-------------------	------------------------------

200108373 Limit Switch Adjustment on Spent Fuel Pool Bridge Crane  
 200105067 Primary Auxiliary Building Monorail Bent Rail

b. Issues and Findings

No significant findings were identified.

1R13 Maintenance Risk Assessment and Emergent Work Activities

a. Inspection Scope (71111.13)

The inspector observed selected portions of emergent maintenance work activities to assess Entergy's risk management. The inspector verified that the licensee took the necessary steps to plan and control emergent work activities, took actions to minimize the probability of initiating events, and maintained the functional capability of mitigating systems. The inspector discussed with maintenance and operations personnel risk management for the following activities:

- WO 02-00129, Replace Valve 866C Disconnect Switch at MCC 26-4M
- WO 02-00534, Breaker Handle for Valve 869B (CR 200203844)
- WO 00-14205, Replace Ground Detection Circuits for Battery Charger 24 on April 16, 2002
- WO 02-41805, Add oil to Unit Auxiliary Tap Changer Compartment (CR 200204154) on April 19, 2002

b. Issues and Findings

No significant findings were identified.

1R14 Personnel Performance During Non-routine Events

a. Inspection Scope (71111.14)

On April 20, 2002, the 23 condensate pump supply breaker tripped due to an over-current condition. On May 9, 2002, operators manually tripped the 21 condensate pump due to higher than normal outboard motor bearing temperatures. Operator actions for both events resulted in a reduction of plant power. The inspector evaluated and verified the licensee's causal analysis for the condensate pump problems. The evaluation focused specifically on the implementation of the predictive and preventative maintenance programs for the motors. Operator response to condensate motor failures are documented in report detail 4OA2.

b. Issues and Findings

GREEN. On April 20, 2002, and on May 8, 2002, the control room operators reduced plant power due to condensate pump motor failures. The 23 condensate pump failed on April 20 due to an instantaneous over-current trip relay actuation. Investigations by Entergy found that the stator winding insulation failed, causing a ground on one of the

three phases. The root cause for the motor failure was less than adequate implementation of the predictive maintenance program.

The condensate motor was last overhauled in 1991. Since August 1995, the licensee has not implemented a biennial motor meggar/high potential test for the condensate motor. The predictive maintenance program was designed to identify motor degradation such as stator winding degradation. Further, the licensee had not tracked or trended condensate motor performance (i.e. running amperes, bearing temperatures) during this time frame. Prior to 1995, the licensee had implemented a periodic 6 year overhaul of the condensate motors.

In July 2000, (Condition reports 200005009 and 200004990) the licensee had an opportunity to investigate potential adverse conditions of the 23 condensate motor. The upper radial bearing reached the alarm setpoint and the licensee's short-term actions were to flush and refill the bearing reservoir. During the post-maintenance test, the motor was found to have an increased vibration signature that indicated a degraded condition. System engineering recommended replacement of the motor in the next 12 months as documented in the referenced condition reports. Notwithstanding, no corrective actions were assigned to ensure that the motor was replaced by July 2001. The inspector reviewed the last completed system health report on the condensate system. The report did not identify any electrical predictive maintenance implementation problems or recommendations to replace the motor as a key issue or as part of a long term plan.

On May 9, 2002, operators tripped the 21 condensate pump due to high motor thrust bearing temperatures. The preliminary cause of the high bearing temperatures was insufficient oil inventory in the upper motor reservoir. At the time, maintenance was flushing a portion of the upper reservoir. Investigations after the trip of the condensate pump noted that the oil level indicator was improperly set too low. This, in combination with the oil reservoir flushing, resulted in the high bearing temperatures. The incorrect level indication was the result of a lack of controls associated with a past motor overhaul. The 21 condensate motor was overhauled by a vendor in the year 2000.

A lack of a predictive maintenance program and an improperly set oil level indication system were the causes for two separate condensate motor failures. The events are more than minor since both events increased the likelihood of an initiating event. Operator response was necessary to ensure an automatic reactor trip did not occur due to a low steam generator level. The performance issues were of very low safety significance since there was no impact to normally available mitigating equipment. The licensee prepared the following condition reports associated with the condensate motor trips (200204831, 200204888, 200204184, 200204182, 200204183, 200204181, and 200204180).

## 1R15 Operability Evaluations

### a. Inspection Scope (71111.15)

The inspectors reviewed selected operability determinations to assess the adequacy of the evaluations, the use and control of compensatory measures, compliance with the

Technical Specifications, and the risk significance of the issues. The inspectors used the Technical Specifications, Technical Requirements Manual, Final Safety Analysis Report, and associated Design Basis Documents as references. The specific issues reviewed included:

- Condition Report 200203844, Inoperable Containment Isolation Valve CS-869B
- Condition Report 200203319, Stroke Time for Post Accident Containment Vent Valve E-3

b. Issues and Findings

GREEN. The licensee entered a 72 hour limiting condition for operation (LCO) per Technical Specification (TS) 3.3.B.2.b at 5:33 a.m. on April 11, 2002, to perform planned testing and maintenance on the 22 containment spray pump and associated valves. The day shift operating crews entered a four hour LCO per Technical Specification 3.6.A.3 at 11:30 a.m. on April 11 for containment isolation valves when containment spray valve 869B was determined to be inoperable (Condition Report 200203844). The operability determination was made after operators attempted to close the valve per tagout (TO) 2002-N-16148 at 10:49 a.m. and determined that the valve disconnect switch on 480 volt motor control center (MCC)-26BB could not be operated.

The disconnect switch was inoperable because the operating handle on MCC-26BB was broken. The disconnect could be manually operated using a wrench, however, the tool was not immediately available at MCC-26BB and this method of operation was not covered by operating procedures in effect. The operators exited the TS 3.6.A.3 four hour LCO at 12:43 p.m. after maintenance personnel repaired the disconnect switch operating handle and successfully cycled the disconnect switch. The licensee initiated CR 200203844 to document the unplanned entry in the 4 hour TS 3.6.A.3 LCO.

The inspector reviewed the maintenance and tagging activities and identified that the operators did not complete a timely operability evaluation for valve 869B. The disconnect switch operating handle on MCC-26BB broke when the operators applied tagout 2002-N-16148 to valve 869B at 5:20 a.m. On April 11, the night shift operators neither verified that the disconnect could be operated nor completed a timely evaluation regarding the ability to close valve 869B to perform its containment isolation function at that time.

An operability evaluation for valve 869B was completed about six hours after the disconnect switch broke by a different operating crew and the operators then entered a four hour limiting condition for operation and isolated the containment penetration per the technical specifications 3.6.A.3.a.2.b. The untimely operability evaluation increased the unavailability time for the containment spray system. The inoperable containment isolation valve was more than minor because it impacts the containment barrier. This issue had very low safety significance since the containment isolation valve was repaired and restored to an operable status prior to exceeding technical specification 3.6.A.3.a.2.d that requires the unit to be in cold shutdown within the following 36 hours utilizing normal operating procedures. This issue was an example of untimely operator

implementation of technical specification requirements in response to degraded safety equipment.

#### 1R19 Post Maintenance Testing

##### a. Inspection Scope (71111.19)

The inspector reviewed post-maintenance test (PMT) 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 maintenance work order (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 IP2's Individual Plant Examination. The regulatory references for the inspection included Technical Specification 6.8.1.a. and 10 CFR 50 Appendix B criteria XIV, "Inspection, Test, and Operating Status." The following testing activities were evaluated:

- WO 98-01999, Remove 23 Component Cooling Water (CCW) Motor and Install Base Plate Modification on April 10, 2002
- WO 02-25424, Re-pack of 21 Emergency Diesel Generator Fuel Oil Transfer Pump on April 9, 2002
- WO 02-42846, Replacement of 21 Condensate Motor on May 12, 2002

##### b. Issues and Findings

No significant findings were identified.

#### 1R22 Surveillance Testing

##### .1 Inspection Scope (71111.22)

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 was adequate and the equipment was properly calibrated, 5) the test was performed per the procedure, 6) the test equipment was removed following testing, and 7) test discrepancies were appropriately evaluated. The surveillance observed was based upon risk significant components as identified in the Indian Point 2 Individual Plant Examination. 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 Technical Specifications 6.8.1.a. The following testing activities were reviewed:

- PT-Q32B, 22 Boric Acid Transfer Pump
- PT-M21C, Emergency Diesel Generator 23 Load Test, Revision 5
- PT-M21A, Emergency Diesel Generator 21 Load Test, Revision 5

b. Issues and Findings

No significant findings were identified.

.2 Surveillance of Safety Barriers

a. Inspection Scope (71111.22)

The inspector reviewed surveillance test procedures and observed testing activities the licensee used to verify the integrity to plant safety barriers. The inspector reviewed the following activities:

- Map 15FC18, Power Distribution and Hot Channel Factor Determination at 99.7% power and 15022.58 MWD/MTU, April 8, 2002
- Primary to Secondary Leak Rate per IPC-A-110S

For core power distribution measurements, the inspector reviewed the licensee's actions to trend the Cycle 15 core peaking factors including the maximum nuclear enthalpy rise hot channel factor ( $F_{\Delta H}$ ). The inspection verified that the hot channel factors remained within the Technical Specification 3.10.2 limits.

The inspector reviewed licensee actions to monitor primary to secondary system leakage and to report leak rate determinations to plant management. The inspector verified that the estimated leak rate from condenser air ejector activity remained generally constant, was consistent with past values, and was well below the minimum reliable detection sensitivity of 0.5 gallons per day.

On May 2 the inspector accompanied licensee personnel during a tour of the containment. The inspection assessed if equipment conditions exist that may be indicative of boric acid corrosion of the reactor vessel head that had been identified in March 2002 at the Davis Besse Nuclear Power Plant in Ohio (reference NRC report 50-346/02-03). This inspection looked for any evidence of leakage from the reactor head instrument cono-seal connections, visual condition of the outside perimeter of the vessel head, and evidence of boric acid accumulation on the fan cooler unit cooling coils or control rod drive mechanism ventilation ducts. No abnormal conditions were identified.

b. Issues and Findings

No significant findings were identified.

**2. RADIATION SAFETY**

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

2OS1 Access Control to Radiologically Significant Areas (71121.01)

a. Inspection Scope

The inspector reviewed radiological work activities and practices and procedural implementation during observations and tours of the facility and inspected procedures, records, and other program documents to evaluate the effectiveness of the licensee's access controls to radiologically significant areas.

The inspector observed activities at the routine radiologically-controlled-area (RCA) access control point on several occasions to verify compliance with requirements for RCA entry and exit, dosimetry placement, and issuance and use of electronic dosimeters. The inspector toured and observed work activities in Unit 2 in the primary auxiliary, fuel storage, and the maintenance and outage buildings. During these observations and tours the inspector reviewed, for regulatory compliance, the posting, labeling, barricading, and level of radiological access control for locked high radiation areas (LHRAs), high radiation areas (HRAs), radiation and contamination areas, and radioactive material areas. The inspector attended a pre-job ALARA briefing on May 2, 2002, for work under Radiation Work Permit (RWP) No. 020207 (Rev. 01) for a vapor containment entry at full power.

The inspector performed a selective examination of RWPs, procedures, records, and other program documents (as listed in the List of Documents Reviewed section) to evaluate the adequacy of radiological controls.

The inspection included a review of eight Condition Reports (CRs) (i.e., CR 2002-00528, 2002-02740, 2002-02865, 2002-02904, 2002-03023, 2002-03507, 2002-03667, and 2002-04164) for the appropriateness and adequacy of event categorization, immediate corrective action, corrective action to prevent recurrence, and timeliness of corrective action.

The review was against criteria contained in 10 CFR 19.12, 10 CFR 20 (Subparts D, F, G, H, I, and J), site Technical Specifications, and site procedures.

b. Issues and Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope

The inspector reviewed the effectiveness of the licensee's program to maintain occupational radiation exposure as low as is reasonably achievable (ALARA).

The inspector reviewed the person-rem estimate and dose budgeting for 2002. The person-rem estimate (136 person-rem) included a scheduled Unit 2 refueling outage and Unit 1 and 2 routine operations. Also reviewed was the first quarter 2002 person-rem estimate versus actual person-rem.

The inspector performed a selective examination of procedures and records (as listed in the List of Documents Reviewed section) for regulatory compliance and for adequacy of control of radiation exposure.

The review was against criteria contained in 10 CFR 20.1101 (Radiation protection programs), 10 CFR 20.1701 (Use of process or other engineering controls), and site procedures.

b. Issues and Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03)

a. Inspection Scope

The inspector reviewed the program for health physics instrumentation and for installed radiation monitoring instrumentation to determine the accuracy and operability of the instrumentation.

During plant tours, the inspector reviewed field instrumentation utilized by health physics technicians and plant workers to measure radioactivity and radiation levels, including portable field survey instruments, hand-held contamination frisking instruments, and continuous air monitors. The inspector conducted a review of the instruments observed in the toured areas, specifically verification of current calibration, of appropriate source checks, and of proper function. The inspector reviewed the licensee's 10 CFR 61 source term reviews to determine if the calibration sources used for contamination monitoring equipment were representative of the current plant source terms, if scaling factors were used to account for hard-to-detect radionuclides, and if the source terms were reviewed on a periodic basis for changes which could require changes in scaling factors.

The inspector reviewed the licensee's evaluation of the capability of its contamination monitoring equipment to detect contamination. Specifically, the inspector reviewed the capabilities of the instrumentation (given the ratios of radionuclides present) to determine if instrument detection capabilities were sufficient to provide reasonable assurance that radioactive contamination could be detected given the fractional abundance of the radionuclides present in its plant mix, including during the steam generator change-out activities. Instruments reviewed included tool monitors, handheld detectors, and personnel monitors. The inspection included a review of two Condition Reports (CRs) (i.e., CR 2001-10979 and 2002-04583), which addressed hard-to-detect radionuclides, for the appropriateness and adequacy of event categorization, immediate corrective action, corrective action to prevent recurrence, and timeliness of corrective action.

The inspector performed a selective examination of procedures, records, and documents (as listed in the List of Documents Reviewed section) for regulatory compliance and adequacy.

The review was against criteria contained in 10 CFR 20.1501, 10 CFR 20 Subpart H, site Technical Specifications, and site procedures.

b. Issues and Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES (OA)**

4OA1 Performance Indicator Verification

The inspector reviewed the licensee's performance indicator (PI) data collecting and reporting process as described in procedure SAO-114, "Preparation of NRC and WANO Performance Indicators." The purpose of the review was to determine whether the methods for reporting PI data are consistent with the guidance contained in NEI 99-02, Revision 1, "Regulatory Assessment Performance Indicator Guidelines." The inspection included a review of the indicator definitions, data reporting elements, calculation methods, definition of terms, and clarifying notes for the performance indicators. Plant records and data were sampled and compared to the reported data. The inspector reviewed the licensee's actions to address discrepancies in the performance indicator measurements to verify problems were satisfactorily resolved.

.1 Reactor Coolant System Leakage

a. Inspection Scope (71151)

The inspector reviewed the performance indicator (PI) for reactor coolant system (RCS) leakage for the period from July until December 2001. This PI remained in the green band. The inspector reviewed the completion RCS leak rate surveillance determinations per SOP 1.7 to verify the adequacy of the reported PI data. The inspector observed licensee actions to characterize RCS leak rate during an entry into the vapor containment on May 2, 2002. The licensee's corrective action program records were

also reviewed to determine if any problems with the collection of PI RCS leakage data had occurred.

b. Issues and Findings

No significant findings were identified.

.2 Reactor Coolant System Activity

a. Inspection Scope (71151)

The inspector reviewed the Performance Indicator (PI) for Reactor Coolant System Activity for the period from June 2001 through March 31, 2002. The PI remained in the green band. The inspector also reviewed and observed sample results for a reactor coolant system sample.

b. Issues and Findings

No significant findings were identified.

.3 Scrams with Loss of Normal Heat Removal

a. Inspection Scope (71151)

The inspector reviewed the Performance Indicator for Scrams with Loss of Normal Heat Removal. The PI remained in the green band. The inspector reviewed licensee event reports between the 2<sup>nd</sup> quarter of 2001 and the 1<sup>st</sup> quarter of 2002.

b. Issues and Findings

No significant findings were identified.

4OA2 Human Performance Cross Cutting Issues

.1 Operator Response to Condensate Pump Motor Trips

a. Inspection Scope

On April 20, 2002, the 23 condensate pump tripped due to over current trip on the 6.9 kilovolt supply breaker. On May 9, 2002, the operators tripped the 21 condensate pump due to higher than normal outboard motor bearing temperatures. The inspector interviewed operators, observed licensee post-job debriefs, observed operators in the control room during the May 9 condensate motor trip, and evaluated the licensee's on-going investigations.

b. Issues and Findings

NO COLOR. On April 20, control room operators took incorrect actions based on an abnormal operating instruction (AOI) 21.1.1, "Loss of Feedwater," knowledge deficiency. Specifically, operators promptly reduced thermal power to approximately 900 megawatts electric (MWe) and had verified feedwater flow was greater than steam flow as required by AOI 21.1.1. The operators, however, continued to reduce plant power to 65% in the next two minutes due to an incorrect understanding that main feedwater pump suction pressure would rapidly increase with a reduction in thermal power. Suction pressure had decreased to 280 psig. Operators assumed the need for them to restore feedwater pump suction pressure with the plant down power based on an AOI 21.1.1 step 5.6.4, main boiler feed pump suction pressure number of 310 psig which pertained to responding to a suction pressure cutback. However, a cutback, which is set to occur in a band of 260-280 psig, had not occurred. Because of this improper procedure usage, operators took actions to reduce plant power in an unnecessary attempt to restore feed pump suction pressure to greater than 310 psig. Additionally, due to the rate of power decrease a loss of load signal also occurred that opened the high pressure steam dumps. Subsequent control system response from the steam generator water level and the high pressure steam dumps during the transient did not initially increase main boiler feed pump suction pressure due to the increase in steam flow from the high pressure steam dumps and the increase in feedwater flow to maintain steam generator level on the program band.

The rapid power decrease caused control rod insertion which caused axial flux difference to deviate from the target band resulting in an entry into technical specification 3.10.2.6.1. This technical specification required reactor power reduction below 50% due to unexpected xenon distributions. Operators reduced power to less than 50% in accordance with the technical specifications.

Technical Specification 6.8.1.a, requires, in part, that written procedures be implemented for activities referenced in Appendix "A" of Regulatory Guide 1.33, Rev. 2. Appendix A includes the requirement for item "6j", "Procedures for Significant events such as a Feedwater System Failure. On April 20, 2002, operators took incorrect actions based on a AOI 21.1.1, "Loss of Feedwater," knowledge deficiency resulting in an unnecessary power transient. The issue was more than minor since the operators' improper procedure usage is considered a precursor to a more significant event. Operator knowledge and skill performance issues have been captured in a number of individual findings in past reports. Examples include operator requalification simulator test results in September 2001, and an overpower condition in August 2001. This issue was placed in the corrective action system as CRs 200204180 and 200204183. This violation is being treated as a Non-cited Violation, consistent with Section VI.A of the Enforcement Policy, issued on May 1, 2000 (65 FR25368) (**NCV 50-247/02-03-01**).

#### 4OA3 Identification and Resolution of Problems

##### .1 Calibration of Measuring and Test Equipment

###### a. Inspection Scope (71152)

The inspector conducted a problem identification and resolution (PI&R) sample inspection to review Entergy's actions to address problems related to accuracy and calibration of measuring and test equipment (M&TE) as documented in Condition Report (CR) 200110493. NRC Inspection Report 50-247/01-10 initially reviewed 31 instances where the calibration and accuracy of M&TE used for safety-related equipment and instrumentation systems were questioned. The inspector reviewed Entergy's long term actions to address this matter in accordance with 10 CFR 50 Appendix B, Criterion XVI, and noted that the working group responsible for this area expanded their review to include all condition reports over the last two years that involved M&TE. In addition, the inspector noted that Entergy had developed a short term and long term schedule to improve M&TE program performance.

###### b. Issues and Findings

No significant findings were identified.

##### .2 Maintenance Rework

###### a. Inspection Scope (71152)

The inspector conducted a problem identification and resolution (PI&R) sample inspection to review Entergy's actions to reduce the frequency of rework. The inspector reviewed Entergy's long term actions to address this matter in accordance with 10 CFR 50 Appendix B, Criterion XVI. This review included the frequency of involvement by the working group responsible for this area, methods used to identify and reduce rework, and actions taken to make the program more consistent with industry standards.

###### b. Issues and Findings

No significant findings were identified.

#### 4OA4 Inspection Item Follow-up

(Closed) URI 05000247/2002-02-03: E-Plan Drill Did Not Complete Worker Accountability in 30 Minutes

NO COLOR. During an inspection conducted in March 2002, the NRC initiated an unresolved item (**URI 50-247/02-02-03**), following changes the licensee made to the process regarding onsite accountability during a site emergency. On March 6, 2002, the licensee implemented revised accountability procedures that required the Unit 3 Lead Accountability Officer to perform accountability for both Indian Point Unit 2 and 3. The revised process and procedures resulted in the licensee exceeding the 30-minute commitment of IP2 Emergency Plan (Section 6.4.1.d, IP2 Implementing Procedure 1027

section 5.1.2.f, and IP3 Emergency Plan Implementing Procedure 1050) by eight minutes during a drill on March 8, 2002. The licensee initiated condition report 200202580 to document this deficiency. Corrective action implemented in response to CR 200202580 returned the accountability process to the previous method of the IP2 Accountability Clerks completing accountability for Unit 2 and the Unit 3 Lead Accountability Officer completing accountability for Unit 3. The corrective actions were demonstrated on an April 10 drill, where the licensee demonstrated onsite accountability in less than 30 minutes.

10 CFR 50.54(q), states, in part, that changes made to the Emergency Plan that decrease the effectiveness of the Plan require prior NRC approval. The changes made to the accountability process on March 6, 2002, decreased the effectiveness of the Emergency Plan such that the licensee was not able to perform site wide accountability within the time limit prescribed in the Emergency Plan and its implementing procedures and prior NRC approval was not obtained. This issue was determined to be a violation of 10 CFR 50.54(q) and was entered into the corrective action system as CR 200202580.

Following the guidance of Inspection Manual Chapter 0610\*, Appendix B, the finding was considered more than minor because, if left uncorrected, it would become a more significant safety concern. Changing commitments in the E-Plan without prior approval impacts the NRC's ability to perform its regulatory function and potentially creates an ineffective response to a radiological emergency. The consequences of this change were minimal because it did not preclude the function of accountability from being performed, albeit delayed. The licensee has implemented the corrective actions stated above and has since met the timeliness goal. This change which decreased the effectiveness of the Plan, is being treated as a non-cited violation consistent with Section VI.A of the Enforcement Policy, issued May 1, 2000 (65 FR 25388). **(NCV 50-247/02-03-02)**. This non-cited violation closes **URI 50-247/02-02-03**.

#### 4OA8 Meetings

##### Exit Meeting Summary

On May 6, 2002, the inspector presented the inspection results of report detail 1R07 to Messrs. T. Poirier, P. Rubin and other members of the licensee staff during a telephone conference call.

On May 16, 2002, the inspector presented the remaining inspection results to Mr. Fred Dacimo, and other members of the licensee staff, who acknowledged the findings. No materials examined during the inspection should be considered proprietary.

As part of the increased NRC management oversight of Indian Point 2, Mr. L. Doerflein, Chief, Systems Branch, Region 1, and Mr. D. Lew, Chief, Performance Evaluation Branch, Region 1, visited the site from April 29 through May 2, 2002. The purpose of the visit was to gain insight into Entergy's current performance and their progress in implementing its improvement plans. Management oversight activities during these visits included discussions with Entergy management/staff on the improvement plans,

discussions with resident and region-based inspectors, review of performance indicators and data, tours of the facility, and observations of plant activities and meetings.

**ATTACHMENT 1**a. Key Points of Contact

R. Allen	Manager, Regulatory Affair
J. Baer	Health Physics Technician
S. Baer	HP Supervisor
J. Cambigianis	System Engineer
R. Decensi	Radiological Protection/Chemistry Manager
F. Dacimo	Vice President, Operations
R. Depatie	System Engineer
W. Durr	Assistant Operations Manager
T. Foley	System Engineer
R. Fuchek	HP Supervisor
D. Gately	Radiation Protection Coordinator
L. Glander	Dosimetry Supervisor
F. Inzurillo	Emergency Planning Manager
W. James	Maintenance and Construction Manager
J. Jawar	Shift Manager
R. Majes	Radiological Support Health Physicist
J. McCann	Manager, Nuclear Safety and Licensing
J. Murdock	Shift Manager
G. Norton	Control Room Supervisor
V. Nutter	Radiological Support Manager
P.K. Parker	Maintenance Manager
R. Richards	HP Supervisor
P. Rubin	Operations Manager
V. Sacco	System Engineer
G. Schwartz	Director of Engineering
E. Salisbury	Radiological Engineer
D. Smith	Radiological Assessor, NQA
P. Speedling	Fire Protection Specialist
T. Tritch	Radiological Engineer
M. Vasely	System Engineering Section Manager
J. Ventosa	System Engineering Manager
J. Zendek	Health Physics Technician

b. List of Items Opened, Closed, and DiscussedOpened and Closed During this Inspection

NCV 50-247/02-03-01	Violation of Technical Specification 6.8.1.a - Improper Procedure Usage
NCV 50-247/02-03-02	Violation of 10 CFR 50.54(q) for Accountability

Closed

URI 05000247/2002-02-03

E-Plan Drill Did Not Complete Worker Accountability in 30 Minutes

c. List of Documents ReviewedProcedures

PT-2Y9A 21 FCU Test, Rev. 0 (completed on 3/22/01)  
 PT-2Y9D 24 FCU Test, Rev. 0 (completed on 12/18/99)  
 PT2Y10A 21 CCW-Heat Exchanger Test, Rev. 1 (completed in October 2001)  
 PT2Y10B 22 CCW-Heat Exchanger Test, Rev. 1 (completed in October 2001)  
 SE-330 System Engineering Inspection Standard, Rev. 2  
 SE-330 Attachment 1 - Inspection Reports for 21 (October 2001), 22 (February 2002), and 23 (January 2002) EDG lube oil and jacket water coolers

Calculations

PGI-00354-02 Generic Letter 89-13 Heat Exchanger Performance Assessment Program  
 PGI-00397-00 Evaluation of 24 FCU Performance Test PT-2Y9D  
 PGI-00462-00 Component Cooling Water Heat Exchanger Performance Evaluation

Drawings

9321-F-2722-105 Flow Diagram Service Water System (Sheet 1 of 2), 1/30/02  
 A209762-63 Flow Diagram Service Water System (Sheet 2 of 2), 12/13/01  
 A227781-70 Flow Diagram Auxiliary Coolant System, 12/10/01

Miscellaneous

IP-2 Response to NRC Generic Letter 89-13, dated February 2, 1990  
 IP-2 Implementation Status of NRC Generic Letter 89-13 Required Actions, dated July 19, 1991  
 IP-2 Updated Implementation Status of NRC Generic Letter 89-13 Required Actions I and II, dated February 11, 1992

System Readiness/Health Report for CCW System (4<sup>th</sup> Quarter 2001)  
 System Readiness/Health Report for CCF System (4<sup>th</sup> Quarter 2001)  
 System Readiness/Health Report for SW System (4<sup>th</sup> Quarter 2001)

IP-2 Maintenance Rule Basis Document - CCW System, Rev. 1  
 IP-2 Maintenance Rule Basis Document - SW System, Rev. 4  
 IP-2 Maintenance Rule Basis Document - CCF System, Rev. 2

Condition Reports

CR 200003578	High concentration of tubercles found on 22 FCU tubesheet
CR 200003842	Sodium hypochlorite system found out of service
CR 200004872	22 FCU normal path low flow alarm received
CR 200006319	Epoxy coating cracked on 23 EDG lube oil and jacket water coolers
CR 200010329	CCW performance test procedure deficiencies
CR 200110318	Negative trending for EDG heat exchanger
CR 200203601	CCW heat balance discrepancy

Section 2OS1. Access Control to Radiologically Significant Areas

RWP No. 020202, Tours and inspections, Rev. 01  
 RWP No. 020207, Vapor containment entries at power, Rev. 01  
 RWP No. 020220, Remove Tri-Nuke filtration system, filter, and underwater light bulb from Unit 2 spent fuel pool, Rev. 01  
 RWP No. 022281, Charging pump maintenance, repair, and test, Rev. 01  
 Procedure SAO-235, Communications, Rev. 4  
 Procedure SAO-301, Personnel dose monitoring program, Rev. 15  
 Procedure SAO-302, Radiation work permits (RWP) program, Rev. 17  
 Procedure DOS-SQ-6.200, Bioassay program, Rev. 14  
 Procedure DOS-10.010, DAC-hr tracking, Rev. 7  
 Procedure HP-SQ-3.002, Equipment and materials release requirements, Rev. 16  
 Procedure HP-3.012, Airborne radioactivity sampling and analysis, Rev. 17  
 Procedure RS-8.002, Skin dose assessment, Rev. 6  
 Skin dose estimate performed on May 2, 2002 due to a contaminated shirt (CR 2001-10979)  
 First quarter 2002 quarterly review of the radiation protection program per SAO-315  
 NQA Assessment Report No. 02-AR-05-RP, Radiation Protection, February 21-27, 2002  
 Self-assessment of radioactive material control, March 11 and 12, 2002  
 Self-assessment of HRAs, LHRAs, SLHRAs, and VHRAs, February 20, 2002

Section 2OS2. ALARA Planning and Controls

Procedure SAO-303, ALARA Program, Rev. 11  
 ALARA reviews performed in 2002 including three for specific RWPs and sixteen for routine RWPs  
 Section 2OS3, Radiation Monitoring Instrumentation and Protective Equipment  
 Procedure SAO-310, Health physics instrumentation program, Rev. 7  
 Procedure DOS-6.205, Technical instructions for operation of the Canberra Fastscan, Rev. 7  
 Procedure HP-9.067, Calibration of the Eberline PCM-1A/1B, Rev. 8  
 Procedure HP-9.590, Calibration of the Eberline tool contamination monitor (TCM-2), Rev. 1  
 Procedure HP-9.591, Calibration procedure for the National Nuclear Model Gamma 40/60 portal monitor, Rev. 3  
 Procedure HP-9.592, Operation of NNC Model Gamma 40/60 portal monitor,

Rev. 5

Procedure HP-9.593, Calibration and operation of the Eberline gamma tool monitor (GTM), Rev. 2

RW-Q-4.006, 10 CFR 61 sampling program, Rev. 8

RW-Q-4.103, 10 CFR 61 radwaste classification, Rev. 5

Records reviewed

Calibration record for gamma tool monitor (No. 108), January 31, 2002

Calibration record for tool contamination monitor (No. 375), December 5, 2001

Calibration record for whole body frisker (No. 140), April 11, 2002

Calibration record for gamma 40/60 portal monitor (No. 1002), March 22, 2002

Instrument count rates for various mixes based on 5000 dpm, May 2002

Typical efficiencies for tool monitors used at Indian Point 2, May 2002

Chemistry gamma spectroscopy report for a contaminated shirt, November 7, 2001

Chemistry gamma spectroscopy report for delayed reactor coolant sample, collected on November 9, 2001, analyzed on November 16, 2001

Chemistry gamma spectroscopy report for Unit 1 smears, April 25, 2002

Chemistry gamma spectroscopy report for Unit 2 smears, April 25, 2002

Radionuclide data base summary for waste type LWS resin, July 2001

Radionuclide data base summary for waste type DAW in 20-foot sealand, May 2001

Radionuclide data base summary for waste type plant primary resin 8-120, July 2001

Whole-body count report with shirt, November 7, 2002

Whole-body count report without shirt, November 7, 2002

Selected decayed reactor coolant gamma spectroscopy data from December 1, 2000 to December 20, 2001

Tool contamination monitor manual (TCM-2)

GTM gamma tool monitor manual

Personnel contamination monitor technical manual (PCM-1B)

Gamma 40/60 portal monitor instruction manual

Condition Report No. 2001-10979, Adequacy of monitoring for Cobalt-58

Surveillance report SR-02-SP1, Adequacy of personnel contamination monitors (PCM) following the replacement of steam generators, April 3, 2002

d. List of Acronyms

ALARA	As Low As Reasonably Achievable
AOI	abnormal operating instruction
CCF	containment cooling & filtration
CCW	closed cooling water
CFR	Code of Federal Regulations
CR	condition report
DBT	design basis threat
EDG	emergency diesel generator
FCU	fan cooling unit
HRA	High Radiation Area
IPEEE	individual plant examination for external events
LCO	limiting condition for operation
LER	licensee event report
LHRA	Locked High Radiation Area
M&TE	measuring and test equipment
MWe	megawatt electric
MCC	motor control center
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
OS	Occupational Safety
PARS	publicly available records
PI	performance indicator
PI&R	problem identification and resolution
PM	preventive maintenance
PMT	post maintenance test
RCA	Radiologically Controlled Area
RCS	reactor coolant system
RWP	Radiation Work Permit
SW	service water
TO	tagout
TS	technical specification
WO	work order