

May 10, 2006

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SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT 2 - NRC INTEGRATED  
INSPECTION REPORT NO. 05000247/2006002

Dear Mr. Dacimo:

On March 31, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Indian Point Nuclear Generating Unit 2. The enclosed integrated inspection report documents the inspection results, which were discussed on March 29, 2006, with Mr. Paul Rubin and other members of your staff.

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

Based on the results of this inspection, four findings of very low safety significance (Green) were identified. These findings were also determined to be violations of NRC requirements. However, because of their very low safety significance, and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. Additionally, two licensee-identified violations which were determined to be of very low safety significance are listed in the report. If you contest the NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Senior Resident Inspector at Indian Point 2.

Mr. F. R. Dacimo

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Sincerely,

*/RA/* by Donald Jackson Acting For

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

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

Enclosure: Inspection Report No. 05000247/2006002  
w/Attachment: Supplemental Information

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION I**

Docket No. 50-247

License No. DPR-26

Report No. 05000247/2006002

Licensee: Entergy Nuclear Northeast

Facility: Indian Point Nuclear Generating Unit 2

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

Dates: January 1, 2006 - March 31, 2006

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## SUMMARY OF FINDINGS

IR 05000247/2006002; 01/01/2006 - 03/31/2006; Indian Point Nuclear Generating Unit 2; Fire Protection; Maintenance Effectiveness; Maintenance Risk Assessments and Emergent Work Control; Personnel Performance During Non-Routine Plant Evolutions and Events.

The report covers a 3-month period of inspection by resident inspectors and regional inspectors. Four Green findings were identified, which were also non-cited violations (NCVs). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

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

#### Cornerstone: Initiating Events

Green. The NRC identified a Green self-revealing NCV of 10 CFR 50.65(a)(4) because Entergy did not adequately assess the risk associated with scaffold construction activities in the cable spreading room. Entergy procedure IP-SMM-WM-100, "Work Management Process," requires a risk assessment for activities that increase the risk of a plant transient. No risk assessment was completed for this work as part of the work planning process, and as a result, no risk management actions were developed. During scaffold construction, a contractor inadvertently bumped a switch which resulted in 12 dropped control rods and a subsequent manual reactor trip. Entergy entered this issue into the corrective action program and took immediate actions to improve control of scaffold construction activities.

This finding is greater than minor because it was similar to Example 4.b. of IMC 0612, Appendix E, "Examples of Minor Issues," in that the performance deficiency contributed to an actual reactor trip. This finding is of very low safety significance because while it resulted in a reactor trip, it did not also contribute to the unavailability of mitigating systems. The inspectors determined that this finding had a human performance cross-cutting aspect in that Entergy personnel failed to appropriately incorporate risk insights into planning of work activities in close proximity to trip risk components. (Section 1R14)

#### Cornerstone: Mitigating Systems

Green. The NRC identified a Green NCV of license condition 2.K. because Entergy failed to identify a degraded three-hour rated fire door between the 21 and 22 residual heat removal pump cells. The door, which provides a barrier to fire and hot gases between the two cells, was determined to be inoperable due to a 3/8 inch gap between the door and frame along the lower half of the door. Entergy entered this issue into the corrective action program and realigned the door.

This finding is greater than minor because it was associated with the Mitigating Systems cornerstone attribute of Protection Against External Factors, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that this finding is of very low safety significance because the degradation of the fire barrier was low, based on the gap in the door having minimal impact on its performance and reliability. The inspectors determined that the finding had a problem identification and resolution cross-cutting aspect because operators who routinely traverse through the degraded fire door during performance of their rounds had not identified the condition of the door in the corrective action system. (Section 1R05)

Green. The NRC identified a Green NCV of 10 CFR 50.65(a)(2) because Entergy failed to effectively control the performance of the rod position indication system through the use of appropriate preventative maintenance. This resulted in the failure of seven rod bottom lights to illuminate following a reactor trip, creating an additional challenge to plant operators. Entergy entered this issue into their corrective action program and is taking actions to upgrade their surveillance and maintenance procedures relative to the rod position indication system.

The inspectors determined that this finding was greater than minor because it affected the Mitigating Systems cornerstone attribute of Equipment Performance, and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance because it did not result in loss of a system or train safety function and did not screen as potentially risk-significant due to seismic, flooding, or severe weather initiating event. The inspectors determined that the finding had a problem identification and resolution cross-cutting aspect because Entergy did not thoroughly evaluate multiple rod position indication bistable failures such that the resolution addressed the causes and extent of condition of problems. (Section 1R12)

Green. The NRC identified a Green self-revealing NCV of license condition 2.K. because Entergy did not take adequate corrective actions for degraded fire protection piping in the utility tunnel. This issue contributed to failure of a 10 inch high-pressure fire protection line in the tunnel. Isolation of this leak resulted in loss of high-pressure fire water to three hose stations in the utility tunnel and three fire hydrants on site. Entergy entered this issue into their corrective action program and is evaluating plans to assess and upgrade the utility tunnel.

This finding is greater than minor because if left uncorrected it would become a more significant safety concern. This finding is of very low safety significance because the areas that lost high-pressure fire water did not contain safety-related or post-fire safe shutdown equipment. The inspectors determined that this finding had a problem identification and resolution cross-cutting aspect because Entergy did not implement timely and effective corrective actions for safety issues associated with degraded piping in the utility tunnel. (Section 1R13)



B. Licensee-Identified Violations

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

## REPORT DETAILS

### Summary of Plant Status

Indian Point Unit 2 (IP2) was operated at or near full power from the beginning of the inspection period until March 1, 2006, when the plant was manually tripped after a contract employee inadvertently bumped a rod control power supply switch, resulting in 12 dropped control rods. The unit was returned to full power on March 2, and operated at or near full power for the remainder of the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01 - 1 sample of system-related weather preparations)

##### a. Inspection Scope

The inspectors reviewed Entergy's administrative controls and implementation of a maintenance program to ensure adequate protection of fire protection water sources from freezing conditions. Specifically, the inspectors reviewed severe weather protection for the diesel-driven fire pump and the fire water storage tank. These components were selected because their risk-significant functions could be affected by adverse weather. The inspectors also reviewed work orders, condition reports, and risk assessments associated with freezing conditions, which had the potential to impact availability of the fire water storage tank or diesel-driven fire pump. The specific information reviewed is listed in the Supplemental Information attachment to this report. This inspection activity represents one system-related adverse weather protection sample.

##### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment (71111.04Q - 3 samples)

##### a. Inspection Scope

The inspectors performed three partial system walkdowns to verify the operability of redundant or diverse trains and components during periods of system train unavailability or following periods of maintenance. The inspectors referenced the system procedures and drawings in order to verify that the alignment of the available train was proper to support its required safety functions. The inspectors also reviewed applicable condition reports and work orders to 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 attachment at the end of this report. The inspectors performed partial walkdowns on the following systems:

Enclosure

- Gas turbine 1 while gas turbine 3 was out of service for maintenance;
- 21 and 22 coolant charging pumps while the 23 coolant charging pump was out of service for cylinder block replacement; and
- 21 and 23 safety injection pumps while the 22 safety injection pump was out of service for periodic testing.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q - 7 samples / 71111.05A - 1 sample)

.1 Quarterly Inspection

a. Inspection Scope

The inspectors toured areas that were identified as important to plant safety or contained risk-significant components. The inspectors consulted the Indian Point 2 Individual Plant Examination for External Events, 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." 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 inspectors 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; (3) the fire barriers used to prevent fire damage or fire propagation; (4) compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with Entergy's fire plan. Reference material used by the inspectors to determine the acceptability of the observed conditions in the fire zones is provided in the attachment at the end of this report. The seven fire areas reviewed included:

- Fire zones 2 and 2A;
- Fire zone 23;
- Fire zone 62A;
- Fire zones 60A, 61A, and 65A;
- Fire zones 55, 55A, 56A, 57A, and 58A;
- Fire zone 14; and
- Fire zones 3 and 4.

b. Findings

Introduction: The inspectors identified a Green non-cited violation (NCV) of license condition 2.K. because Entergy failed to identify a degraded three-hour rated fire door between the 21 and 22 residual heat removal (RHR) pump cells.

Description: On January 29, 2006, the inspectors performed a fire protection walkdown of 21 and 22 RHR pump cells, designated as fire zones 3 and 4. The inspectors noted that a three-hour rated swing-type fire door which separates the zones would not close properly and left a 3/8 inch gap along the lower half of the door. A review of Entergy's fire protection plan stated that the door was installed so as to preclude the passage of flame and hot gases between the RHR pump cells. Since this door separates the RHR pump cells, degradation of this door could allow the propagation of a fire to impact both safety-related pumps.

The inspectors informed the operations watch staff of the issue, and they determined that the door was improperly aligned with the frame. The operators evaluated the condition, took appropriate compensatory measures, realigned the door, and entered the condition in the corrective actions process (CR-IP2-2006-00411).

Analysis: The inspectors determined this condition was a performance deficiency since the door was in a degraded condition that resulted in the fire barrier being inoperable. It was reasonable that this condition should have been identified by Entergy since operators routinely pass through the area in which the fire door was located and the gap was readily apparent. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function and the finding was not the result of any willful violation of NRC requirements. The issue is more than minor since it is associated with the Protection Against External Factors attribute of the Mitigating System cornerstone and impacts the cornerstone objective of ensuring the reliability, availability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspectors performed a Phase 1 screening of the deficiency in accordance with Inspection Manual Chapter (IMC) 0609 and evaluated the safety-significance using IMC 0609 Appendix F, "Fire Protection Significance Determination Process." The issue was determined to be of very low safety significance since the degradation of the fire barrier was low based on the gap having a minimal impact on the performance and reliability of the fire door.

The inspectors determined that the finding had a problem identification and resolution cross-cutting aspect because operators who routinely traverse through the degraded fire door during performance of their rounds had not identified the condition of the door.

Enforcement: License condition 2.K. requires that Entergy implement and maintain in effect all provisions of the NRC-approved fire protection program, as approved in part by the NRC Safety Evaluation Report dated January 31, 1979. The January 31, 1979, Safety Evaluation Report requires administrative controls comparable to those described in NRC Branch Technical Position 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976." Branch Technical Position 9.5-1 requires that measures be established to assure that conditions adverse to fire protection, such as deficiencies, deviations, defective components, and non-conformities are promptly identified, reported, and corrected. Contrary to license condition 2.K., Entergy failed to promptly identify the degraded condition of the RHR pump cell fire door. Once identified

by the inspectors, the licensee initiated CR-IP2-2006-00411 to enter the deficiency in their corrective actions process (CAP). Because the violation was of very low safety significance and entered into their CAP, this violation is being treated as an NCV per Section VI.A of the NRC Enforcement Policy: **NCV-05000247/2006002-01, Degraded Residual Heat Removal Pump Cell Fire Door.**

Corrective actions taken included the implementation of the compensatory measures required by procedure SAO-703, "Fire Protection Impairment Criteria and Surveillance," and aligning the door to eliminate the gap.

.2 Annual Inspection

a. Inspection Scope

The inspectors observed an unannounced fire brigade drill. The drill was conducted in accordance with the Entergy's preplanned drill scenario and simulated an oil fire in the residual heat removal pump cells. 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:

- Donning of protective clothing/turnout gear by fire brigade members;
- Proper use of self-contained breathing apparatus equipment;
- Capability and use of fire hose lines to reach all necessary fire hazard locations;
- Control of fire brigade members' entrance into the fire area;
- Adequacy of the fire fighting equipment brought to the scene by the fire brigade;
- Clarity and effectiveness of the fire brigade leader's fire fighting directions;
- Efficiency and effectiveness of radio communications with the plant operators and between fire brigade members;
- Adequacy of fire brigade members' search for fire victims and propagation of the fire into other plant areas;
- Effectiveness of simulating smoke removal operations;
- Use of the fire fighting pre-plan strategies;
- Adherence to the licensee's pre-planned drill scenario; and
- Adequacy of the drill objectives and acceptance criteria.

The inspectors also observed the post-drill critique and evaluated it for thoroughness and degree of critical self-assessment. The inspection of the unannounced fire brigade drill represents one inspection sample.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 - 1 sample of internal flooding)

a. Inspection Scope

The inspectors reviewed Entergy's internal flood analysis, flood mitigation procedures, and design features for control building flood zone CB-15-1, to verify that they were consistent with IP2's design requirements. The inspector walked down this area and adjacent areas to evaluate the condition and adequacy of mitigation equipment, and to assess whether flood protection design features were adequate.

The inspectors reviewed a sample of Entergy's preventive maintenance and surveillance procedures on flood mitigation equipment. In addition, the inspectors reviewed the CAP to verify that 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. This walkdown constituted one inspection sample.

b. Findings

No findings of significance were identified.

1R11 Operator Requalification Inspection (71111.11Q - 1 sample)

a. Inspection Scope

The inspectors observed an Emergency Plan drill implementation by licensed operators in the simulator. The inspectors reviewed the simulator scenario performed as a part of the overall drill 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; (3) operators' ability to properly interpret and verify alarms; (4) operators' ability to classify events in a timely fashion; and (5) 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. This inspection represents one inspection sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q - 2 samples)

a. Inspection Scope

The inspectors evaluated Entergy's work practices and maintenance-related corrective actions for selected structures, systems, and components (SSCs) to assess the effectiveness of maintenance activities. The inspectors reviewed the performance history of those SSCs and assessed extent of condition determinations performed by Entergy personnel for those issues with potential common cause or generic implications to evaluate the adequacy of corrective actions. The inspectors reviewed problem identification and resolution actions to evaluate whether they had appropriately monitored, evaluated, and dispositioned the issues in accordance with Entergy's procedures and the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance." In addition, the inspectors reviewed selected SSC classification, performance criteria and goals, and the corrective actions that were taken or planned, to verify that the actions were reasonable and appropriate. The inspectors specifically reviewed the following two samples within the scope of this inspection:

- Inoperability of the 23 coolant charging pump due to cylinder block leakage; and
- Performance of the rod position indication (RPI) system.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR 50.65(a)(2) in that Entergy failed to effectively control the performance of the RPI system through appropriate preventive maintenance. This resulted in no indication on seven rod bottom lights following a reactor trip and created an additional challenge for plant operators.

Description: During the response to a reactor trip which occurred on March 1, 2006, the operators noted that 7 rod bottom light had failed to illuminate. In accordance with EOP E-0, "Reactor Trip or Safety Injection," the operators again manually tripped the reactor and verified the reactor was shut down using alternate indications. Later troubleshooting showed that the seven rods had inserted correctly, but that the rod bottom light bistable for each of the rods had failed.

The RPI system provides indication to the operators of the position of all rod clusters in the core at all times when fuel is loaded. The rod bottom lights provide the operators with rapid assessment capability during a reactor trip or rod drop event to evaluate plant conditions. After a reactor trip, the operators immediately verify the reactor is shut down. One of the verification actions per the EOPs is to ensure that all rod bottom lights are lit. If not, the procedure requires the operators to manually trip the reactor and verify the reactor is shut down by evaluating other indications.

The inspectors reviewed maintenance performed on this portion of the system and overall system reliability. The inspectors noted that the bistable calibration had been changed from a monthly surveillance to a biennial surveillance in October 2004. A review of corrective actions and work orders showed that in the 14 months prior to the periodicity change, a total of seven bistables were identified as failed during the monthly surveillance and replaced. In each case, a condition report was written on the failure and subsequent replacement. In addition, the 2004 RPI System Health Report noted five bistable replacements were required due to monthly test failures and indicated this was a negative trend. However, no actions were taken to evaluate bistable reliability or potential impacts on testing frequency.

The inspectors reviewed the Surveillance Test Change Authorization Process and noted that it strictly focused on Technical Specification requirements. Therefore, the request to increase the surveillance periodicity from monthly to twenty-four months did not require a review of system reliability or any increased scrutiny based on the RPI system being classified as a maintenance rule system. In addition, the process to change the surveillance periodicity was not followed. The concurrence from the cognizant system engineer prior to the change was not obtained as required by procedure IP-SMM-DC-904, "Surveillance Test Program."

Analysis: The inspectors determined this condition was a performance deficiency since Entergy failed to effectively control the performance of the RPI system through appropriate preventive maintenance. The inspectors determined that it was reasonable that Entergy identify this deficiency since multiple failures were placed in the corrective actions process and the system health report identified the bistables failures as an adverse trend. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements. The issue was more than minor since it is associated with the Equipment Performance attribute of the Mitigating System cornerstone and impacts the cornerstone objective of ensuring the reliability, availability, and capability of systems that respond to initiating events to prevent undesirable consequences.

This finding was evaluated using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." The issue was determined to be of very low safety significance since it did not result in the loss safety function, exceed a Technical Specification allowed outage time, or screen as risk-significant due to seismic, flooding or severe weather initiating events. Although this deficiency created an additional challenge to the operators, the EOPs are designed to place the plant in a safe condition in the absence of the rod bottom indications, and the operators performed the required steps in accordance with the EOPs.

The inspectors determined that the finding had a problem identification and resolution cross-cutting aspect because Entergy did not thoroughly evaluate multiple rod position indication bistable failures such that the resolution addressed the causes and extent of condition of problems.



**Enforcement:** 10 CFR 50.65(a)(2) states in part that monitoring as required in paragraph (a)(1) is not required where it is demonstrated that the condition of a system is effectively controlled through the performance of appropriate preventive maintenance such that the system remains capable of performing its intended function. Contrary to this requirement, Entergy did not monitor the system in accordance with paragraph (a)(1) and failed to effectively control the performance of the rod bottom bistables through appropriate preventive maintenance as required by paragraph (a)(2). Inspectors determined that the preventive maintenance was not appropriate since the periodicity of the bistable calibration was not sufficient to ensure the system could perform its intended function. Once identified, the licensee initiated condition report IP2-2006-01012 to enter the deficiency in their CAP. Corrective actions taken included a change request to increase the calibration frequency of the rod bottom bistables, and reviews of the surveillance change process. Because the violation was of very low safety significance and entered into their CAP, this violation is being treated as an NCV per Section VI.A of the NRC Enforcement Policy: **NCV 05000247/2006002-02, Failure to Effectively Control the Performance of the Rod Position Indication System.**

1R13 Maintenance Risk Assessment and Emergent Work Control (71111.13 - 6 samples)

a. Inspection Scope

The inspector observed selected portions of emergent and planned maintenance work activities to assess Entergy's risk management in accordance with 10 CFR 50.65(a)(4). The inspector 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. The inspector observed and discussed risk management with maintenance and operations personnel. The specific information reviewed is referenced in the Supplemental Information attachment at the end of this report. The following six activities were observed:

- Work order IP2-06-00078, leak from a 10 inch fire protection line in the utility tunnel;
- Work order IP2-05-24082, 22 coolant charging pump leak following discharge check valve replacement;
- Condition report IP2-2006-01281, scaffolding control during refueling outage preparations;
- Work order IP2-05-01500, 23 battery charger fan replacement;
- Work order IP2-03-21306, 13.8 kilovolt bus section 3 outage; and
- Engineering request 05-2-059, emergency diesel generator service water piping replacement.

b. Findings

Introduction: The inspectors identified a Green NCV of license condition 2.K. because Entergy failed to take adequate corrective actions for degraded fire protection piping and supports in the utility tunnel. This contributed to the failure of a 10 inch fire protection line, which resulted in loss of fire water to a portion of the high-pressure fire protection header.

Description: On February 22, 2006, plant operators identified a 20 to 30 gallon per minute leak from a 10 inch high-pressure fire protection line in the Indian Point utility tunnel. The leak was isolated by closing a number of manual valves, which resulted in loss of high-pressure fire water to three hose stations in the utility tunnel and three fire hydrants on site. The inspectors verified that Entergy had appropriately implemented SAO-703, "Fire Protection Impairment Criteria and Surveillance," which provides required compensatory measures for degradation of fire protection equipment. Because no areas containing safety-related or post-fire safe shutdown equipment lost high-pressure fire water, no compensatory actions were required. This issue was entered into Entergy's corrective action program.

The Indian Point utility tunnel is approximately 1250 feet long and contains fire protection, city water, and fuel oil piping, as well as drain, sewer, station air, and auxiliary steam lines. In addition, various electrical lines run through portions of the tunnel. The fire protection and city water systems make up the most risk-significant components in the utility tunnel. The fire protection lines provide high-pressure fire water to hose stations and hydrants throughout the site. In addition to providing a backup source of water for the auxiliary feedwater system, the city water system supplies portions of the fire protection system, as well as providing backup cooling water to the charging, residual heat removal, and safety injection pumps.

The inspectors reviewed corrective action documents and reports for previously identified deficiencies in the utility tunnel, and conducted a walkdown to assess the current material condition. Studies were completed in 2000 and 2004 by Consolidated Edison and Entergy, respectively, to evaluate the conditions and develop actions to upgrade the tunnel. Ingress of water, particularly during periods of heavy rain, has caused localized severe degradation in piping, supports, and electrical conduits. Ultrasonic testing (UT) was conducted at locations throughout the tunnel in 2000, and several sections of pipe were replaced due to wall thinning and pitting. The 2004 study also identified poor material conditions in the utility tunnel, and recommended an action plan, beginning with replacement of severely degraded pipe supports, actions to stop the ingress of water, and more UT examinations to determine the extent of degradation and prioritize a repair and replacement schedule. No corrective actions were taken by Entergy in response to the 2004 study.

In September 2005, in response to NRC concerns regarding the structural integrity of city water and fire protection piping in the utility tunnel, Entergy completed an additional three UT examinations. While the results of these tests did not identify any piping with less than minimum wall thickness, the inspectors noted that the scope was limited

considering the amount of piping and the degree of degradation. In addition, one of the locations that Entergy elected to UT in 2005 had been previously replaced in 2000. The inspectors noted that, at the time of the fire protection line failure in February 2006, Entergy did not have any formal plans for future UT examination in the tunnel, or plans to complete any of the recommendations from the 2004 utility tunnel study.

Analysis: The inspectors determined that Entergy's failure to take adequate corrective actions for fire protection piping degradation in the utility tunnel was a performance deficiency. This issue was reasonably within Entergy's ability to foresee and prevent, given that the severe degradation had been previously identified. Traditional enforcement does not apply since there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements or Entergy procedures. This finding is greater than minor because if left uncorrected it would become a more significant safety concern. Specifically, if left uncorrected, the piping would continue to degrade and the probability of piping failure would continue to increase. This finding was evaluated using IMC 0609, Appendix F, "Fire Protection Significance Determination Process." It was found to be of very low safety significance because the finding was associated with the fixed fire protection system category and because no safety-related or post-fire safe shutdown equipment was located in the areas which lost high-pressure fire water, represented a low level of fire protection degradation.

The inspectors determined that this finding had a problem identification and resolution cross-cutting aspect because Entergy did not implement timely and effective corrective actions for safety issues associated with degraded piping in the utility tunnel.

Enforcement: License condition 2.K. requires that Entergy implement and maintain in effect all provisions of the NRC-approved fire protection program, as approved in part by the NRC Safety Evaluation Report dated January 31, 1979. The January 31, 1979, Safety Evaluation Report requires administrative controls comparable to those described in NRC Branch Technical Position 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976." Branch Technical Position 9.5-1 requires that measures be established to assure that conditions adverse to fire protection, such as deficiencies, deviations, defective components, and non-conformities are promptly identified, reported, and corrected. Contrary to license condition 2.K., Entergy failed to promptly correct a condition adverse to fire protection in that corrective actions were not taken for known material condition deficiencies in the utility tunnel. Because the issue was of very low safety significance and entered into Entergy's CAP (CR-IP2-2006-00893), this violation is being treated as an NCV per Section VI.A of the NRC Enforcement Policy: **NCV 05000247/2006002-03, Inadequate Corrective Actions for Fire Protection Piping Degradation.**

1R14 Personnel Performance During Non-routine Plant Evolutions and Events (71111.14 - 3 samples)

a. Inspection Scope

For the three non-routine planned and unplanned evolutions described below, the inspectors reviewed plant procedures, operator logs, plant computer data, and strip charts to evaluate operator performance in coping with non-routine events and to determine if operator response was in accordance with that required by procedures and training. A list of documents reviewed is included in the Supplemental Information attachment to this report.

- On January 11, 2006, the inspectors responded to the control room to observe Entergy's actions for a rod control urgent failure alarm. The inspectors verified that operators were appropriately implementing their abnormal operating procedures, and observed troubleshooting and repair activities associated with the condition.
- On February 23, 2006, the inspectors observed activities associated with diving operations in the Unit 2 spent fuel pool. The purpose of this evolution was to perform vacuum box testing and sealing of potential defects in the spent fuel pool liner. The inspectors reviewed radiological work permit 052040, "Diving Operations and Inspections in the Spent Fuel Pool," Revision 2 to verify that appropriate radiological controls were being used. The inspectors also observed the diving evolution to confirm that the operation was conducted as planned and in accordance with Entergy's procedures and NRC requirements.
- On March 1, 2006, plant operators manually tripped the reactor after a contract employee assembling scaffolding in the cable spreading room inadvertently caused 12 dropped control rods. The inspectors observed operator response in the control room and, prior to plant restart, the inspectors verified that Entergy had completed an appropriate evaluation of the event and taken adequate interim corrective actions. In addition, the inspectors observed important activities associated with the power ascension.

b. Findings

Introduction: A Green self-revealing NCV of 10 CFR 50.65(a)(4) was identified because Entergy did not adequately assess the risk associated with scaffolding construction activities in the cable spreading room. This contributed to an unplanned reactor trip that occurred when a worker inadvertently bumped a rod control power supply switch.

Description: On March 1, 2006, contractor employees were working to install scaffolding in the IP2 cable spreading room in preparation for an upcoming refueling outage. A worker inadvertently bumped the power supply disconnect switch to rod control power supply cabinet 1AC, opening the switch and causing 12 control rods to drop into the core. Control room operators responded by manually tripping the reactor, in accordance

with plant operating procedures. Subsequent investigation into the event revealed that the work crew had been briefed by their supervisor that they were to remain inside the envelope of the scaffold while working. During the scaffold installation activities, one of the workers went outside the boundary of the scaffold, where he hit the switch.

10 CFR 50.65(a)(4) requires that licensees assess the risk of maintenance activities prior to conducting work on certain structures, systems, and components. Entergy procedure IP-SMM-WM-101, "On-Line Risk Assessment," requires that work in close proximity to sensitive equipment, which could cause a plant trip, be considered a "proximity risk." Work of this nature would require upper management approval and is discussed at the morning plan of the day meeting, which is led by the IP2 and IP3 shift managers. The scaffolding construction efforts in the cable spreading room were not discussed, nor was the increase in trip risk reflected in the plant's daily on-line risk estimate or included on the list of trip risk activities at the plan of the day meeting. In addition, the shift manager, control room supervisor, and field support supervisor on watch at the time of the trip did not know that scaffolding was being constructed in the vicinity of sensitive equipment. A recent change to the work authorization process had removed direct authorization by Operations prior to starting work of this nature. The pre-job brief with the workers had included a discussion of the sensitivity of the equipment in the cable spreading room, but did not specifically identify the rod control power supply cabinet switches as trip risks.

Entergy procedure IP-SMM-WM-100, "Work Management Process," requires a risk assessment for activities that increase the risk of a plant transient. No risk assessment was completed for this work as part of the work planning process, and as a result, no risk management actions were developed. These switches were near the top of the cabinets, and so they were not labeled as posing a trip risk to the plant. Because the work was not risk-assessed, compensatory protective measures were not considered. Entergy entered this issue into the corrective action program (CR-IP2-06-01011) and immediately suspended all scaffolding construction efforts pending a review of the risk of each job. Entergy initiated actions to revise the work control process to ensure risk assessments are performed for work of this nature.

Analysis: The inspectors determined that Entergy's failure to adequately assess the risk of scaffolding construction activities in close proximity to sensitive, trip risk components in accordance with station procedures is a performance deficiency. The inspectors determined that this issue was within Entergy's ability to foresee and prevent, given that procedural guidance directed a risk assessment for this type of work. Traditional enforcement does not apply because there were no actual safety consequences or potential for impacting the NRC's regulatory function, and the finding was not the result of any willful violation of NRC requirements or Entergy procedures. This finding is greater than minor because it was similar to Example 4.b. of IMC 0612, Appendix E, "Examples of Minor Issues," in that the performance deficiency contributed to an actual reactor trip. This finding was evaluated using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." The inspectors determined that this finding is of very low safety significance because

while the finding resulted in a reactor trip, it did not also increase the likelihood that mitigation equipment or functions would be unavailable.

The inspectors determined that this finding had a human performance cross-cutting aspect in that Entergy personnel failed to appropriately incorporate risk insights into planning of work activities in close proximity to trip risk components.

**Enforcement:** 10 CFR 50.65 (a)(4) requires that before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of the assessment may be limited to structures, systems, and components that a risk-informed evaluation process has shown to be significant to public health and safety. Contrary to the above, the inspectors identified that Entergy did not adequately assess and manage the risk associated with scaffolding construction activities in the cable spreading room in close proximity to trip-risk components which resulted in a reactor trip on March 1, 2006. Because the issue was of very low safety significance and entered into Entergy's CAP (CR-IP2-06-01011), this violation is being treated as an NCV per Section VI.A of the NRC Enforcement Policy: **NCV 05000247/2006002-04, Scaffolding Control Issue Results in Reactor Trip.**

1R15 Operability Evaluations (71111.15 - 5 samples)

a. Inspection Scope

The inspectors selected a sample of Entergy's operability evaluations for review on the basis of potential risk significance. 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 completed as specified by procedure ENN-OP-104, "Operability Determinations," and that they were technically adequate. References used during these reviews included the TSs, the Technical Requirements Manual, the Final Safety Analysis Report, and associated design basis documents. The specific information reviewed is referenced in the Supplemental Information attachment at the end of this report. The following operability evaluations were reviewed and constitute five inspection samples:

- Condition report IP2-2006-00109, pliers dropped in the recirculation sump during maintenance;
- Condition report IP2-2006-00115, failure of the control room toxic gas monitoring system;
- Condition report IP2-2006-00134, 23 battery following unanticipated response during maintenance;
- Condition report IP2-2006-00149, potential integral fuel absorber rod defects; and
- Condition report IP2-2006-01042, auxiliary feedwater flow control valve 406D out of position during reactor startup.

b. Findings

Two licensee-identified violations associated with this review are discussed in Section 4AO7. No other findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 - 7 samples)

a. Inspection Scope

The inspectors reviewed post maintenance testing procedures and associated testing activities to assess whether: (1) the effects of testing in the plant had been adequately addressed by control room personnel; (2) testing was adequate for the maintenance 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. The following testing activities were evaluated, and constituted seven inspection samples:

- Work order IP2-05-28658, 23 emergency diesel generator (EDG) following corrective maintenance for speed control problems;
- Work order IP2-05-00936, gas turbine 3 following repairs to the fuel and lube oil systems;
- Work order IP2-05-14635, 22 containment spray pump following motor-operated valve maintenance;
- Work order IP2-05-15117, 26 service water pump following strainer replacement and valve maintenance;
- Work order IP2-05-28650, 21 EDG pre-lube pump following replacement;
- Work order IP2-05-13845, 23 EDG following semi-annual preventative maintenance; and
- Work order IP2-05-21995, EDG service water supply piping header replacement.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

On March 1 and 2, 2006, the inspectors observed the plant recovery following a manual reactor trip and the subsequent restart activities. The inspectors verified that operator actions were completed in accordance with plant operating procedures and that procedure transitions were performed at the required points. The inspectors also completed plant walkdowns and reviewed plant equipment availability prior to plant

mode changes to ensure that the applicable requirements were met. The inspectors evaluated deficiencies identified during the shutdown to verify that they were appropriately understood, dispositioned, and did not require any start-up holds. The associated activities constituted one inspection sample.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 5 samples)

a. Inspection Scope

The inspectors 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) the test discrepancies were appropriately evaluated. The surveillance tests observed were based on risk-significant components as identified in the IP2 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 TS 5.4.1. The surveillance tests reviewed included:

- 2-PT-Q30C, "23 Component Cooling Water Pump," Revision 13;
- 2-PT-Q27B, "23 Auxiliary Boiler Feed Pump Quarterly Test," Revision 11;
- PT-EM13, "CCR Filtration," Revision 9;
- 2-SOP-1.7, "Reactor Coolant System Leakage," Revision 41; and
- 2-PT-Q28B, "22 Residual Heat Removal Pump," Revision 16.

b. Findings

No findings of significance were identified.

1R23 Temporary Modifications (71111.23 - 1 sample)

a. Inspection Scope

The inspectors reviewed one temporary modification to ensure that the effects on plant operation were well understood and to ensure that no unintended adverse consequences would result from the modification. Specifically, the inspectors reviewed modification 2-TAP-001-ROS, which installed a reverse osmosis skid for the refueling water storage tank. The inspectors evaluated the modification documentation for



accuracy and completeness, the basis for the modification, and any associated procedures or changes to procedures to control the temporary modification operation.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04 - 1 sample)

a. Inspection Scope

The NRC had received and acknowledged the changes made to the Indian Point Emergency Plan and implementing procedures. The changes were made in accordance with 10 CFR 50.54(q), which the licensee had determined did not result in a decrease in effectiveness to the Plan and concluded that the changes continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR 50. During this in-office inspection, the inspector conducted a sampling review of the changes which could potentially result in a decrease in effectiveness. This review does not constitute an approval of the changes and, as such, the changes are subject to future NRC inspection. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4. The requirements in 10 CFR 50.54(q) were used as reference criteria. This inspection activity represented one sample.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05 - 2 samples)

a. Inspection Scope

The inspectors evaluated Entergy's corrective actions taken in regard to the current Indian Point alert and notification system, as described in Entergy's letter to the NRC, dated October 25, 2005. The inspection was conducted March 7 through 15, 2006, outside of the normal emergency preparedness baseline inspection program. This deviation from the baseline inspection program was authorized by the NRC Executive Director of Operations in a memorandum signed October 31, 2005.

Entergy had completed a number of corrective actions for the Indian Point siren system since the NRC's Emergency Preparedness program inspection conducted in November 2005. These corrective actions included:

- Installation of parallel data communication lines to provide redundancy to the existing frame relay;

- New routers as the interface between the data communication system and the siren control system;
- Installation of a high-speed data communication line between the siren activation points and the siren control system, as a backup to the frame relay network;
- Real-time monitoring of the data communication lines; and
- Indian Point on-site monitoring of siren performance to allow for the notification of Entergy duty personnel on a system failure.

The inspectors discussed the implementation of these corrective actions with the Indian Point Information Technology supervisor and reviewed all condition reports written against the siren system since the November 2005 inspection in order to assess the effectiveness of the actions.

The inspectors observed the performance of the quarterly siren test conducted on March 8, 2006, to assess the effectiveness of the corrective actions and the performance of the siren system. The inspectors monitored the test from the Indian Point Emergency Operations Facility and observed the initial activation of 138 of the 156 sirens: one failed siren had a pre-existing power supply problem; two had a communications failure; and 15 failed to activate when a siren repeater was prevented from operating due to local radio frequency interference. The inspectors were present when the siren test was invalidated by the failure of the siren feedback system to confirm proper operation of the 138 activated sirens.

The inspectors returned to the site Emergency Operations Facility on March 15, 2006, for a repeat performance of the quarterly siren test. Entergy had determined the cause of the March 8 feedback system failure to be a lock-up of the operating system on the siren control system server. Entergy had also determined that the server could have been recovered by re-booting the computer and reinitiating siren activation. Entergy had not re-booted the server on March 8, in order to capture data from the computer hard drive. The inspectors discussed the failure mechanism and planned corrective actions with a number of information technology specialists and observed the successful performance of the siren test, in which all 156 sirens successfully activated and sounded.

While on-site, the inspectors also discussed with the assigned design engineer the vendor selection and design plans for the new siren system Entergy plans to install. This new siren system is intended to meet the requirements of the Energy Policy Act of 2005 and of the NRC's Confirmatory Order dated January 31, 2006.

In addition to observing the March 8 and March 15 full siren sounding tests from the Indian Point Emergency Operating Facility, the inspectors also observed from the Rockland County and Westchester County Emergency Operation Centers, and at various siren locations in Rockland and Westchester Counties. The observations of these two siren tests constituted two samples.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06 - 1 sample)a. Inspection Scope

The inspectors observed an Emergency Preparedness drill conducted on February 1, 2006 and an Alert Notification System test on March 8, 2006. The inspectors used NRC Inspection Procedure 71114.06, "Drill Evaluation" as guidance and criteria for evaluation of the drill. The drill consisted of an Emergency Notification Siren test and an Emergency Response Organization Drill. The inspectors observed the drill and conducted reviews from the Indian Point Emergency Operations Facility. The inspectors focused the reviews on the identification of weaknesses and deficiencies in the classification and notification timeliness and quality and accountability of essential personnel 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.

## 4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 - 3 samples)a. Inspection Scope

The inspectors reviewed the licensee's data submitted to the NRC for the performance indicators (PIs) listed below, and performed an independent verification that the source data was consistent with plant records. The inspectors reviewed the licensee's collecting and reporting process for PI data as described in procedure SAO-114, "Preparation of NRC and WANO Performance Indicators." The purpose of these reviews was to determine whether the methods for reporting PI data were consistent with the guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 2. 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.

Reactor Safety Cornerstone

- Unplanned Scrams per 7,000 Critical Hours (January 2004 - December 2005)
- Reactor Coolant System Leakage (January 2004 - December 2005)
- Emergency AC Power System Unavailability (January 2004 - December 2005)

The inspectors reviewed operator log entries, daily morning reports (including the daily condition report descriptions), the monthly operating reports, and PI data sheets to determine whether the licensee adequately reported the above performance indicators during the previous eight quarters. In addition, the inspectors also interviewed licensee personnel responsible, as necessary for the PI data collection, evaluation, and distribution.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Daily Review

a. Inspection Scope

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 corrective action program. This review was accomplished by reviewing hard copies of each condition report.

b. Findings

No findings of significance were identified.

.2 PI&R Annual Sample - Selected Issue Follow-up Inspection - Aggregate Impact of Operator Workarounds (71152 - 1 sample)

a. Inspection Scope

The inspectors conducted a review of the aggregate impact of operator burdens and workarounds. The inspectors reviewed Entergy's implementation of procedures OAP-45, "Operator Burden Program," Revision 0 and PL-163, "Operations Expectations and Standards," Revision 2. The inspectors verified that operator workarounds and burdens were appropriately entered into the corrective actions program and were dispositioned commensurate with their safety significance.

b. Assessment and Observations

No findings of significance were identified. The inspectors determined that in general, Entergy was entering issues that represented operator workarounds and burdens into the corrective action program. Issues that could impact operator response during plant events were appropriately prioritized and corrective actions were timely. However, the inspectors identified one example where Entergy's actions for a degraded condition were

inconsistent with the guidance in OAP-45. Following the identification of leakage from the 22 coolant charging pump, Entergy elected to declare the pump operable with the pump suction valve closed and the control switch in pull-to-lock. The inspectors identified that the requirements of OAP-45 were not followed. Specifically, the requirements to document in a condition report the actions needed to operate the pump and the procedure to be used were not performed until questioned by the inspectors. In addition, while the pump and its suction valve were tagged to alert operators to this condition, there were no instructions on the tag to identify that the suction valve was to be opened prior to starting the pump, as specified in Entergy procedure EN-OP-102, "Protective and Caution Tagging." These issues were evaluated by the inspectors and determined to be minor because even though OAP-45 was not followed, operators were familiar with the actions necessary to start the pump, and it could be accomplished in a timely manner.

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

##### a. Inspection Scope

The inspectors responded to a manual reactor trip that occurred on March 1, 2006. Control room operators initiated the trip in response to 12 dropped control rods that resulted from a contract worker inadvertently contacting a switch, which interrupted power to rod control cabinet 1AC. The inspectors observed Entergy's post-trip response in the control room to verify that plant equipment response was as expected, and to ensure that operating procedures were being appropriately implemented. The inspectors attended post-trip review and forced outage meetings, and discussed the event with plant management. The purpose of these reviews was to confirm that Entergy had taken appropriate corrective actions prior to commencing restart activities.

##### b. Findings

This issue was dispositioned in Section 1R14.

#### 4OA5 Other Activities

##### .1 (Closed) URI 05000247/2004-09-04 Acceptability of Using Dual Fuses to Provide Electrical Independence for Cables at Indian Point 2 Station

In May 2004, NRC inspectors identified a question regarding the acceptability of using dual fusing to provide electrical independence in lieu of physical separation for cables. To address this question, Region I requested the NRC's Office of Nuclear Reactor Regulation (NRR) provide an evaluation to determine whether: (1) reliance on two protective devices in a non-safety circuit (installed to ensure that an overload or fault will not cause the circuit cables to exceed their thermal limits) provide adequate independence between redundant safety systems; and (2) pursuant to 10 CFR 50.59, the licensee needed to obtain a license amendment prior to implementing the change (i.e., relying on protective devices as a substitution for physical separation).

The results of the NRR review was that the use of two protective devices in a non-safety-related circuit provides independence between redundant safety systems when the system is operated in a grounded configuration. This is the case at Indian Point Unit 2 when the electrical buses are being supplied by the offsite power system. The NRR review also concluded that sole reliance on two safety-related protective devices may not be adequate to provide independence between systems when the system is operated in an ungrounded configuration. However, additional protective measures (such as adequate cable insulation level, quick detection, and isolation of ground faults) could be included in the licensee's evaluation and used to address this concern in order to maintain independence between redundant safety systems. The Indian Point Unit 2 system is operated in an ungrounded configuration when the electrical systems are being supplied by the emergency diesel generators.

Additionally, the NRR review concluded that a license amendment was not required prior to implementing the change (i.e., relying on protective devices as a substitution for physical separation).

The licensee reviewed the adequacy of the electrical system design and licensing basis with respect of operation in an ungrounded configuration as well as the adequacy of the 480 V system cable insulation ratings. The licensee review concluded that the designs and cable insulation ratings were acceptable.

Region I inspectors performed an in-office review of the NRR and licensee evaluations and found the positions to be acceptable. No violations of NRC requirements were identified. This item is closed.

.2 Institute of Nuclear Power Operations (INPO) Plant Assessment Report Review

a. Inspection Scope

The inspectors reviewed the final report for the INPO plant assessment of Indian Point Energy Center conducted in July 2005. The inspectors reviewed the report to ensure that issues identified were consistent with the NRC perspectives of licensee performance and to verify if any significant safety issues were identified that required further NRC follow-up

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

Exit Meeting Summary

On March 29, 2006, the inspectors presented the inspection results to Mr. Paul Rubin and other Entergy staff members, who acknowledged the inspection results presented. Entergy did not identify any material as proprietary.

#### 4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as NCVs.

- 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be accomplished in accordance with documented procedures. Contrary to the above, on March 2, 2006, IP2 operators failed to follow procedure 2-SOP-21.3, "Auxiliary Feedwater System Operation," and left one of the flow control valves from the 23 auxiliary boiler feedwater pump closed and in manual for a period of approximately four hours. This finding was identified in Entergy's corrective action program as IP2-06-01042. This licensee-identified violation was more than minor since it was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and impacts the cornerstone objective of ensuring the reliability, availability, and capability of systems that respond to initiating events to prevent undesirable consequences. This licensee identified violation is of very low safety significance because it did not result in a loss of safety function for a single train for greater than the TS allowed outage time.
- TS 5.4.1 requires that written procedures be established, implemented, and maintained covering the activities listed in Appendix A of Regulatory Guide 1.33. Regulatory Guide 1.33 requires that procedures be used for maintenance activities that can affect the performance of safety-related components. Contrary to the above, on January 9, 2006, two maintenance mechanics removed the grating from the containment recirculation sump to retrieve a pair of pliers without following the normal work control process. This licensee-identified violation is more than minor since it is associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and impacts the cornerstone objective of ensuring the reliability, availability, and capability of systems that respond to initiating events to prevent undesirable consequences. This issue was identified in Entergy's corrective action program as IP2-06-00109. Using IMC 0609, the inspectors evaluated the risk significance of this issue. Based upon the issue resulting in an actual loss of system safety function, a Phase 2 analysis was required per the Phase 1 screening. The inspectors used the Risk-Informed Inspection Notebook for Indian Point Nuclear Generating Station Unit 2, Revision 2, to conduct the Phase 2 evaluation. The duration of the condition was approximately 15 minutes, resulting in the use of an initiating events likelihood value of less than three days. No credit was given for operator recovery actions. The Phase 2 approximation yielded a result of very low safety significance (Green). The most dominant accident sequence involved a small break loss of coolant accident initiating event and the subsequent failure of low pressure recirculation capability [SLOCA (5) + LPR (3) = 8].

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

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

F. Dacimo, Site Vice President  
 P. Rubin, General Manager, Plant Operations  
 J. Comiotes, Director, Nuclear Safety Assurance  
 J. Ventosa, Director, Engineering  
 A. Vitale, Site Operations Manager  
 A. Williams, IP2 Operations Manager  
 T. Barry, Manager, Security  
 T. Carson, Manager, Maintenance  
 P. Conroy, Manager, Licensing  
 F. Inzirillo, Emergency Planning Manager  
 T. Orlando, Manager, Systems Engineering  
 T. Jones, Licensing Supervisor  
 L. Lee, System Engineering Supervisor  
 J. O'Driscoll, System Engineer  
 D. Shah, System Engineer  
 S. Wilkie, Fire Protection Engineer  
 T. Beasley, System Engineer

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

05000247/2006002-01	NCV	Degraded Residual Heat Removal Pump Fire Door
05000247/2006002-02	NCV	Failure to Effectively Control the Performance of the Rod Position Indication System
05000247/2006002-03	NCV	Inadequate Corrective Actions for Utility Tunnel Degradation
05000247/2006002-04	NCV	Scaffolding Control Issue Results in Reactor Trip

Closed

05000247/2004009-02	URI	Acceptability of Using Dual Fuses to Provide Electrical Independence for Cables at Indian Point 2 Station
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**LIST OF DOCUMENTS REVIEWED**

**Section 1R01: Adverse Weather Protection**

Procedures

2-SOP-11.5, "Space Heating and Winterization," Revision 31

Condition Reports

IP2-05-00576

IP2-05-04132

IP2-05-04436

**Section 1R04: Equipment Alignment**

Procedures

2-COL-3.1, "Chemical and Volume Control System," Revision 36

2-COL-31.1, "Gas Turbine 1," Revision 8

2-SOP-11.5, "Space Heating and Winterization," Revision 31

Drawings

9321-2736, "Chemical and Volume Control System Flow Diagram, Sheet 1," Revision 121

208168, "Chemical and Volume Control System Flow Diagram, Sheet 2," Revision 53

303222, "GT-3 Pressure Switches and Transmitter Cabinet," Revision 3

304122, "GT-2/3 Fuel Forwarding System Flow Diagram," Revision 5

Condition Reports

IP2-05-05314

IP2-05-05315

**Section 1R05: Fire Protection**

Procedures

PT-Q41, "Fire Doors in the PAB," Revision 6

PT-EM28, "Fire Dampers Operability," Revision 5

PT-M55, "Fire Doors," Revision 12

SAO-703, "Fire Protection Impairment Criteria," Revision 20

Calculations

PGI-00433, "Fire Protection - Combustible Loading Calculation," Revision 1

Miscellaneous

IP2-RPT-03-00015, "IP2 Fire Hazards Analysis," Revision 1  
Safety Evaluation Report RA-84-A67, "Technical Exemption from the Requirements of 10 CFR  
50, Appendix R for the Indian Point Nuclear Generating Plant, Unit 2"

**Section 1R06: Flood Protection Measures**

Procedures

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

Condition Reports

IP2-00-00419

IP2-02-00676

IP2-04-01795

Miscellaneous

Indian Point 2 Probabilistic Safety Assessment, Revision 0

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

Procedures

ECA-1.1, "Loss of Emergency Coolant Recirculation," Revision 15  
ECA-1.3, "Loss of Emergency Coolant Recirculation Caused by Sump Blockage," Revision 0  
ES-1.3, "Transfer to Cold Leg Recirculation," Revision 25  
FR-C.1, "Response to Inadequate Core Cooling," Revision 16  
FR-P.1, "Response to Imminent Pressurized Thermal Shock Conditions," Revision 14

**Section 1R12: Maintenance Effectiveness**

Procedures

ENN-DC-138, "Technical Evaluations of Components and Replacement Items," Revision 4  
ENN-LI-100, "Process Applicability Determination," Revision 6  
ENN-LI-101, "10 CFR 50.59 Process," Revision 7  
IP-SMM-DC-904 Attachment 10.4, "Surveillance Test Change Authorization," Revision 1  
PT-M7, "Analog Rod Position Functional," Revision 26

Condition Reports

IP2-05-00941

IP2-06-00189

IP2-03-04845

IP2-06-00150

IP2-06-01102

IP2-04-01169

Work Orders

IP2-06-00083

IP2-03-10046

Miscellaneous

Technical Evaluation 06-000107, Procurement Engineering Technical Evaluation for Replacement of 21, 22, and 23 Coolant Charging Pump Cylinder Blocks  
Indian Point Maintenance Rule Basis Document Rod Position Indication, Revision 0  
Action Industries Action Pack AP1000 through AP1024 Specification Sheet  
IP2 Rod Position Indication System Annual Report 2004

Drawings

9321-05-FP-2229, "Outline Dimensions - Direct Drive Thru Hydraulic Coupling," Revision 0

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

Procedures

0-SYS-014-GEN, "Scaffolding Construction and Control," Revision 4  
2-SOP-3.1, "Charging, Seal Water, and Letdown Control," Revision 58  
FR-S.1, "Response to Nuclear Power Generation/ATWS," Revision 40  
ENN-MS-S-009-IP2, "IP1/IP2 System Safety Function Sheets," Revision 0  
SAO-703, "Fire Protection Impairment Criteria and Surveillance," Revision 20  
SAO-711, "Quality Assurance Requirements for Fire Protection Systems," Revision 0  
ENN-DC-167, "Classification of Structures, Systems, and Components," Revision 2  
EN-LI-102, "Corrective Action Process," Revision 4  
SMM-DC-901, "IPEC Fire Protection Program Plan," Revision 2  
2-SOP-27.1.6, "Instrument Bus, DC Distribution System and PA System Inverter," Revision 37  
IP-SMM-WM-101 Attachment 2, "On Line Risk Evaluation," Revision 01

Work Orders

IP2-97-95447

IP2-98-00739

IP2-05-12071

IP2-97-95454

IP2-98-01817

IP2-05-24082

IP2-97-95459

IP2-04-21763

IP2-06-00040

IP2-97-95462

IP2-04-28803

IP2-03-21306

Condition Reports

IP2-02-02857

IP2-06-00893

IP2-06-01281

IP2-05-03576

Miscellaneous

1354972-R-001, "Indian Point Unit 1 Utility Tunnel Plan," Revision 0

Scaffold Permit 25552 and 25552B  
NRC Branch Technical Position APCS 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976," August 23, 1976  
Technical Report 00263-TR-001, "Functionality and Risk-Significance Evaluation of the Indian Point Unit 1 and 2 Mechanical and Electrical Systems Locating in the Utility Tunnel," Revision 0  
Indian Point 2 Technical Specification Section 3.8, "Electrical Power Systems"  
Indian Point 2 Technical Specification Section 3.4, "Instrumentation"  
Operator's Risk Report, February 16, 2006  
Engineering Request, ER-05-2-059, "IP2 EDG Service Water Piping Replacement"

Drawings

9321-F-4006, "Yard Fire Protection Piping," Revision 74  
Updated Final Safety Analysis Report Figure 8.2-16, Single Line Diagram - DC System Power Panels No. 21 thru 24," Revision 15A  
A250907, "Electrical Distribution and Transmission System," Revision 21  
A244014, "One-Line 440VAC SWGR Unit Subsation," Revision 19

**Section 1R14: Operator Performance During Non-Routine Evolutions**

Procedures

IP-SMM-WM-100, "Work Management Process," Revision 4  
IP-SMM-WM-101, "On-Line Risk Assessment," Revision 0  
2-AOP-ROD-1, "Rod Control and Indication Systems Malfunction," Revision 3

Work Orders

IP2-04-11031	IP2-05-26214	IP2-05-26696
IP2-05-25552		

Condition Reports

IP2-06-01011	IP2-06-01014	IP2-06-01311
IP2-06-01012	IP2-06-01016	IP2-06-00135

Miscellaneous

Radiological Work Permit 062024, "Diving Operations and Inspection in the Spent Fuel Pool," Revision 0

**Section 1R15: Operability Evaluations**

Procedures

2-SOP-11.1, "Ventilation System Operation," Revision 46  
2-SOP-21.3, "Auxiliary Feedwater System Operation," Revision 36  
IP-SMM-MA-118, "Foreign Material Exclusion," Revision 1

Calculations

FEX-00055-01, "125 VDC Battery 23 Voltage Profile"  
FEX-00046-02, "125 VDC Battery 23 Minimum Voltage Analysis"  
FEX-00127-00, "IP2 Battery 23 and 24 Test Profile"

Condition Reports

IP2-04-01781	IP2-04-01951	IP2-06-01042
IP2-04-01820	IP2-06-00082	IP2-06-00134
IP2-04-01948	IP2-06-00109	IP2-06-00491

Miscellaneous

System Engineering White Paper, 23 Battery Voltage Expected Response  
Operations Protected Equipment List During 23 Battery Charger Outage  
CAP-RCA-06-013-C004, "Damaged Top Pellet in IFBA Rods," Revision 0  
Westinghouse Input to Operability Determination/Functionality Assessment for Damaged Annular Axial Blanket Pellet

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

Procedures

2-PT-M21C, "Emergency Diesel Generator 23 Load Test," Revision 12  
2-PT-Q13, "Inservice Valve Tests," Revision 36  
2-PT-Q26F, "26 Service Water Pump," Revision 8  
2-SOP-31.3.2, "Gas Turbine 3 Local Operations," Revision 16  
AOI 31.3, "Gas Turbine 3," Revision 7  
PT-Q35B, "22 Containment Spray Pump Test," Revision 14  
IP-SMM-MA-118, "Foreign Material Exclusion," Revision 0

Condition Reports

IP2-03-00570	IP2-06-00898	IP2-05-05360
IP2-05-05339	IP2-06-00349	IP2-06-00045
IP2-05-00750	IP2-06-00580	

Work Orders

A1-7

IP2-03-17913	IP2-05-15117	IP2-06-10041
IP2-04-12911	IP2-05-15118	IP2-06-10180
IP2-05-00936	IP2-05-24091	IP2-05-13845
IP2-05-01438	IP2-05-28649	IP2-05-21995
IP2-05-14634	IP2-05-28658	IP2-05-20426
IP2-05-14635	IP2-05-28668	IP2-05-01431
IP2-05-15116	IP2-06-10040	IP2-05-28650

Drawings

9321-F-2722-112, "Flow Diagram - Service Water System Nuclear System Supply Plant, Sheet 1 of 2," Revision 112  
A227496, "Diesel Generator Building, Location of Service Cooling River Water Pipe Welds," Revision 9  
MI-17019, "ALCO - Rotary Pumps"  
B244641, "Piping Schematic - L.O. System Emergency Diesel Generators No. 21, 22, and 23," Revision 3

**Section 1R20: Refueling and Other Outage Activities**

Procedures

2-POP-3.2, "Plant Recovery from Trip - Mode 3," Revision 33  
2-POP-1.2, "Reactor Startup - Mode 3 To Mode 2," Revision 47  
2-POP-1.3, "Reactor Startup - Mode 2 To Mode 1," Revision 70  
2-SOP-21.3, "Auxiliary Feedwater System Operation," Revision 36  
E-0, "Reactor Trip or Safety Injection," Revision 45

Condition Reports

IP2-2006-01013	IP2-2006-01015	IP2-2006-01017
IP2-2006-01014	IP2-2006-01016	

**Section 1R22: Surveillance Testing**

Procedures

2PT-Q27B, "23 Auxiliary Boiler Feed Pump," Revision 11  
2-PT-M58, "CCR Ventilation Area Radiation Monitors and Control," Revision 32  
2-SOP-1.7, "Reactor Coolant System Leakage," Revision 41  
2-SOP-1.7.1, "Determining the Source of Reactor Coolant System Leakage," Revision 7  
PT-EM13, "CCR Filtration," Revision 9  
PT-Q28B, "22 Residual Heat Removal Pump," Revision 15  
2-PT-Q030C, "23 Component Cooling Water Pump," Revision 13

Condition Reports



**Section 1EP6: Emergency Plan Drill**

Procedures

IP-EP-410, "Protective Action Recommendations," Revision 3  
IP-EP-120, "Emergency Classification," Revision 1  
IP-EP-AD13, "IPEC Emergency Plan Administrative Procedures," Revision 2

**Section 4OA1: Performance Indicator Verification**

Procedures

IP-SMM-LI-114, "Performance Indicator Preparation Process," Revision 1

Condition Reports

IP2-05-00348	IP2-05-02340	IP2-05-03701
IP2-05-00645	IP2-05-02875	IP2-06-00394
IP2-05-01207	IP2-05-03279	IP2-06-00847

**Section 4OA2: Problem Identification and Resolution**

Procedures

ENN-WM-100, "Work Request Generation, Screening, and Classification," Revision 0  
OAP-045, "Operator Burden Program," Revision 0  
PL-163, "Operations Expectations and Standards," Revision 2

Work Orders

IP2-05-01220	IP2-05-24082	IP2-06-11450
IP2-05-19161		

**Section 4OA3: Event Followup**

Procedures

2-POP-3.2, "Plant Recovery from Trip - Mode 3," Revision 33  
2-POP-1.2, "Reactor Startup - Mode 3 To Mode 2," Revision 47  
2-POP-1.3, "Reactor Startup - Mode 2 To Mode 1," Revision 70  
2-SOP-21.3, "Auxiliary Feedwater System Operation," Revision 36  
E-0, "Reactor Trip or Safety Injection," Revision 45

Condition Reports

IP2-2006-01013	IP2-2006-01014	IP2-2006-01015
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## LIST OF ACRONYMS

CAP	corrective action program
CFR	Code of Federal Regulations
EDG	emergency diesel generator
EOP	emergency operating procedure
IMC	inspection manual chapter
INPO	Institute of Nuclear Power Operations
IP2	Indian Point Unit 2
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PI	performance indicator
RHR	residual heat removal
RPI	rod position indication
SDP	significance determination process
SSC	systems, structures, and components
TS	Technical Specification
UT	ultrasonic test