

# Indian Point 2

## 3Q/2007 Plant Inspection Findings

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### Initiating Events

**Significance:**  Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE TO INCORPORATE DESIGN BASIS INFORMATION INTO PROCEDURES TO ASSURE ADEQUATE COOLING WATER FLOW TO THE RCP THERMAL BARRIERS**

The inspectors identified a Green, non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion III, "Design Control," in that, Entergy did not appropriately incorporate design requirements into an operating procedure used to establish adequate component cooling water (CCW) flow to the reactor coolant pump (RCP) thermal barriers. Specifically, the flow specification in the CCW operating procedure did not incorporate the calculated design flow requirements to bound allowable CCW temperature limits. Entergy entered this issue into their corrective action program and will be evaluating the flow requirements specified in procedure 2-SOP-4.1.2, "Component Cooling Water System Operation," to ensure that they bound the allowed plant operating limits.

The inspectors determined that this finding was more than minor because it was associated with the Equipment Performance attribute of the Initiating Events cornerstone; and, it affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, Entergy did not incorporate design flow requirements necessary to assure adequate cooling water flow to the RCP thermal barriers into the plant operating procedures which establish the required flow. On a loss of seal injection, the procedure did not ensure that the heat removal capability was adequate to prevent a rise in seal temperature which would require the RCP to be stopped with a subsequent reactor trip. The inspectors evaluated the significance of this finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." This finding was determined to be of very low safety significance because it would not result in exceeding the Technical Specification limit for identified reactor coolant system leakage and would not have likely affected other mitigating systems resulting in a loss of their safety function. The inspectors found that the procedurally established nominal flow band would have assured adequate cooling of the RCP thermal barriers for the highest CCW supply temperature recorded over the previous year.

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because the operating procedure used to set the flow rate of cooling water to the RCP thermal barriers was not adequate to make certain that sufficient cooling water was available to assure the components could perform their design function. (Section 1R15)

Inspection Report# : [2007002](#) (*pdf*)

**Significance:**  Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **FAILURE TO ESTABLISH TESTING TO ASSURE ADEQUATE COOLING WATER FLOW TO THE RCP THERMAL BARRIERS**

The inspectors identified a Green, NCV of 10 CFR 50 Appendix B, Criterion XI, "Test Control," in that, Entergy did not establish appropriate testing to assure adequate component cooling water (CCW) flow to the reactor coolant pump thermal barriers. Specifically no preventive maintenance activities or functional checks were conducted for the individual flow meters. It was determined that the rotameters on 21 and 23 RCP were not indicating correctly and that actual CCW flow to the thermal barrier heat exchangers was less than the design requirements for CCW temperature. Entergy entered this issue into their corrective action program (CR-IP2-2007-00783 and 00955), adjusted individual cooling water flow within the nominal band using ultrasonic flow meters, wrote work orders to replace the faulty flow meters, and is conducting an evaluation to determine the appropriate test requirements for the flow indicators.

This inspectors determined that this finding was more than minor because it was associated with the Equipment Performance attribute of the Initiating Events cornerstone; and, it affected the cornerstone objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, Entergy's test program did not assure that all testing required to demonstrate that the RCP thermal barriers will perform satisfactorily in service because no testing was performed to ensure the accuracy of the individual flow meters used to establish the required cooling water flow. Consequently, it was identified that two individual flow indicators did not read correctly and the CCW flow to two RCP's was not sufficient to assure adequate cooling in the event that seal water was lost based on the flow requirements established in design calculations. On a loss of seal injection, the cooling water flow would not ensure that the heat removal capability was adequate to prevent a rise in seal temperature which would require the RCP to be stopped with a subsequent reactor trip. The inspectors evaluated the significance of this finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." This finding was determined to be of very low safety significance because it would not result in exceeding the Technical Specification limit for identified reactor coolant system leakage and would not have likely affected other mitigating systems resulting in a loss of their safety function. (Section 1R15)

Inspection Report# : [2007002](#) (*pdf*)

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

#### **INADEQUATE RISK ASSESSMENT FOR 21 MBFP STEAM INLET VALVE**

The inspectors identified a Green non-cited violation (NCV) of Title 10 of the Code of Federal Regulations (CFR), Part 50.65(a)(4), because Entergy did not adequately assess and manage the risk of on-line maintenance activities while operating with a degraded steam inlet valve on one of Entergy's two main boiler feed pumps (MBFP). Specifically, from November 16 through 21, 2006, the degraded condition of the 21 MBFP increased the likelihood of a reactor trip, but was not assessed or included in the plant's on-line risk model. Entergy entered this issue into their corrective action program and properly assessed 21 MBFP risk on November 21, 2006.

The inspectors determined that this finding was more than minor because Entergy failed to consider risk significant structures, systems, components, and support systems that were unavailable during the performance of on-line maintenance. Specifically, Entergy failed to assess the increase in online risk from the increased likelihood of a reactor trip due to the 21 MBFP degraded condition. The inspectors evaluated this finding using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," and determined that this finding was of very low safety significance because the finding resulted in an increase in the incremental core damage probability of less than  $1 \times 10^{-6}$  (actual increase was approximately  $2 \times 10^{-8}$ ).

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Entergy did not provide complete and accurate procedures, in that, the online risk assessment procedure did not require degraded equipment that impacted risk to be assessed or managed.

Inspection Report# : [2006005](#) (*pdf*)

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## **Mitigating Systems**

**Significance:**  Feb 16, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

#### **INADEQUATE DESIGN CONTROL ASSOCIATED WITH VORTEXING AND NET POSITIVE SUCTION HEAD CALCULATIONS**

The team identified a finding of very low significance involving a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," in that, Entergy did not ensure adequate suction submergence for the three safety injection (SI) pumps by not properly translating vortex and net positive suction head (NPSH) design parameters into

calculations relative to reactor water storage tank (RWST) level. Specifically, Entergy used a non-conservative method to calculate the level required to prevent pump vortexing, and used a non-conservative RWST level value for determining available NPSH for the SI pumps. Entergy entered the issue into their corrective action program and revised the affected calculations.

The finding is more than minor because the calculation deficiencies represented reasonable doubt on the operability of the SI pumps, even though the pumps were ultimately shown to be operable. The finding is associated with the design control attribute of the Mitigating Systems cornerstone 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 has very low safety significance, based on Phase 1 of the significance determination process (SDP), documented in NRC Inspection Manual Chapter 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," because it was a design deficiency that did not result in a loss of SI system operability, based upon the team's verification of Entergy's revised calculations.

Inspection Report# : [2007007](#) (*pdf*)

**Significance:**  Feb 16, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **INADEQUATE DIFFERENTIAL PRESSURE VALUE USED FOR MOV 746 AND MOV 747 TONENSURE VALVE CAPABILITY**

The team identified a finding of very low significance involving a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," in that, Entergy did not accurately incorporate design parameters into valve thrust calculations for motor operated valve (MOV) 746 and MOV 747. Specifically, Entergy used an incorrect and non-conservative differential pressure in the calculations for MOV 746 and MOV 747, which were developed to verify that the valves could develop sufficient thrust to open under postulated design basis conditions. Additionally, an incorrect equation was used in determining the reduction in motor torque due to degraded voltage conditions. Entergy entered the issue into their corrective action program and revised the affected calculations using the correct information.

The finding is more than minor because the calculation deficiencies represented reasonable doubt on the operability of MOV 746 and MOV 747. The finding is associated with the design control attribute of the Mitigating Systems cornerstone 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 has very low safety significance, based on Phase 1 of the SDP, because it was a design deficiency that did not result in a loss of MOV 746 and MOV 747 operability, based upon the team's verification of Entergy's revised calculations.

Inspection Report# : [2007007](#) (*pdf*)

**Significance:**  Feb 16, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **INADEQUATE DESIGN CONTROL FOR ENVIRONMENTAL EFFECTS TO ENSURE THE AVAILABILITY OF THE TURBINE DRIVEN AUXILIARY FEEDWATER PUMP OPERATION**

The team identified a finding of very low safety significance involving a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," in that, Entergy did not establish adequate design control measures to ensure the availability of the turbine driven auxiliary feedwater pump (TDAFWP) during a postulated loss-of-offsite power (LOOP) event. Under certain LOOP situations, the team determined that the TDAFWP steam supply could be inadvertently isolated because of inadequate calculations and procedures for limiting the AFWP room temperature rise. Specifically, a calculation to determine the auxiliary feedwater pump (AFWP) room temperature rise during a LOOP did not include heat input from the TDAFWP. Further, actions that could limit the rise in AFWP room temperature and prevent the inadvertent isolation of the TDAFW pump (opening an AFWP room roll-up door or promptly restoring forced ventilation) were not included in procedures. Entergy entered this issue into their corrective action program, implemented immediate compensatory actions, and revised AFWP room temperature rise calculations.

The finding is more than minor because it is associated with the design control attribute of the Mitigating Systems cornerstone 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 has very low safety significance, based on Phase 1 of the SDP, because it did not represent the loss of safety function of the TDAFWP (single train) for greater than its 72 hour technical specification allowed outage time, based on the team's review and assessment of site ambient temperature data over the last year.

Inspection Report# : [2007007](#) (*pdf*)

**Significance:**  Feb 16, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

**FAILURE TO ADEQUATELY MONITOR GAS TURBINE SYSTEM PERFORMANCE AS REQUIRED BY THE MAINTENANCE RULE**

The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50.65 (a)(1), the Maintenance Rule, in that, Entergy failed to monitor the gas turbine (GT) system in a manner that provided reasonable assurance that the system could perform its intended safety function. Specifically, Entergy did not establish appropriate GT reliability goals, and therefore did not take corrective actions, when GT-1 had exceeded these goals for maintenance preventable functions failures (MPFF). In addition, Entergy did not properly classify repeat MPFFs, which resulted in a similar failure to take corrective actions as required. This resulted in additional GT-1 out of service time that would not have happened if appropriate actions had been taken. Entergy entered this issue into their corrective action program and lowered the allowable goal for MPFFs, and revised the GT-1 (a)(1) action plan to improve reliability.

The finding is more than minor because appropriate GT reliability goals were not established commensurate with safety and appropriate corrective actions were not taken when goals were not met. This finding is associated with the equipment performance attribute of the Mitigating Systems cornerstone 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 has very low safety significance, based on Phase 1 and Phase 2 of the SDP, which considered that the additional GT-1 out of service time due to this issue could be as much as three days. The finding has a cross-cutting aspect in the area of human performance because Entergy did not adequately ensure procedures were complete, accurate, and up-to-date. Specifically, procedure ENN-DC-171, "Maintenance Rule Monitoring," did not provide steps to discriminate between the classification of an initial design deficiency and further failures due to the same condition, resulting in mis-classifying several GT functional failures.

Inspection Report# : [2007007](#) (*pdf*)

**Significance:**  Feb 16, 2007

Identified By: NRC

Item Type: FIN Finding

**FAILURE TO CORRECT DEGRADED GAS TURBINE 1 RELIABILITY**

The team identified a finding of very low safety significance involving Entergy procedure, EN-LI-102, "Corrective Action Process," in that, Entergy failed to take corrective actions to address degraded GT-1 reliability. This resulted in a two and one half day time period in January 2007 when GT-1 and GT-3 were simultaneously inoperable because, after GT-3 was made inoperable for planned maintenance activities, GT-1 was subsequently found to be inoperable. Specifically, the reliability of GT-1 declined from an average of 75% for 2005 and the first 10 months of 2006, to 50% for the three months from November 2006 to January 2007; however, Entergy did not take actions to correct this degraded reliability. Entergy entered this issue into their corrective action program and developed an action plan to address GT reliability issues.

The issue is more than minor because it is associated with the equipment reliability attribute of the Mitigating Systems cornerstone 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 has very low safety significance, based on Phase 1 and Phase 2 of the SDP, assuming that both GT-1 and GT-3 were unavailable for the two and one half days, due to this issue. The finding has a cross-cutting aspect in the area of problem identification and resolution because Entergy did not correct degraded reliability of GT-1, resulting in having GT-1 and GT-3 simultaneously inoperable.

Inspection Report# : [2007007](#) (*pdf*)

**G****Significance:** Feb 16, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

**INADEQUATE STATION BATTERY CAPACITY TESTING FOR DEGRADATION MONITORING**

The team identified a finding of very low safety significance (Green) involving a non-cited violation of Technical Specification 3.8.6.6, in that, Entergy did not perform station battery capacity testing in accordance with IEEE Standard 450-1995 (related to battery maintenance and testing). Specifically, Entergy procedurally terminated battery capacity testing at the rated discharge time (four hours), before reaching the minimum voltage, as specified by IEEE Standard 450-1995. This prevented accurate quantitative measurement of capacity degradation and identification of the need to conduct potential accelerated battery testing, as specified by both IEEE Standard 450-1995 and the technical specifications, if battery capacity drops by more than 10% relative to the previous test. Entergy entered the issue into their corrective action program and performed calculations using past test data, which demonstrated that the capacities of station batteries had not degraded more than 10%.

This issue is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding has very low safety significance, based on Phase 1 of the SDP, because it did not represent the loss of station battery safety function, based upon the team's verification of Entergy's calculations.

Inspection Report# : [2007007](#) (*pdf*)**G****Significance:** Feb 16, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

**INEFFECTIVE CORRECTIVE ACTION FOR HIGH INTER-TIER BATTERY RESISTANCES**

The team identified a finding of very low safety significance involving a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," in that, Entergy did not take effective corrective actions for a condition adverse to quality concerning out-of-tolerance inter-tier resistances on the No. 21 station battery. Specifically, after repeated failures of the No. 21 station battery inter-tier resistance testing, vendor and IEEE Standard 450-1995 recommended corrective actions were not taken to correct the adverse out-of-tolerance resistance trend. Entergy entered the issue into their corrective action program and performed calculations, which demonstrated that the voltage drop due to the as-found resistance of the inter-tier connections was small and did not impact No. 21 battery operability.

This issue is more than minor because if it was left uncorrected, it would have become a more significant safety concern. Specifically, high resistance connections in a battery that is loaded during accident conditions can cause localized heating and can cause permanent damage to the battery. The finding has very low safety significance, based on Phase 1 of the SDP, because it did not represent the loss of No. 21 station battery safety function, based upon the team's verification of Entergy's revised calculations. The finding has a cross-cutting aspect in the area of problem identification and resolution because Entergy did not take effective corrective actions to address the adverse trend of out-of-tolerance inter-tier resistances.

Inspection Report# : [2007007](#) (*pdf*)**G****Significance:** Feb 16, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

**UNTIMELY CORRECTIVE ACTIONS FOR DECREASE IN BATTERY MARGIN**

The team identified a finding of very low safety significance involving a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," in that, Entergy did not promptly identify and correct a condition adverse to quality, with respect to known errors in the No. 23 station battery design calculations. Specifically, Entergy did not recognize at the appropriate time the need to write a condition report, perform an operability determination, or place controls on the use of the No. 23 battery design calculations when errors were discovered in the No. 23 battery design calculations that significantly lowered the battery capacity margin. Entergy entered the issue into their corrective action program and performed calculations, which demonstrated No. 23 station battery operability through the next refueling outage, based on the calculated margin and conservatism available.

This issue is more than minor because it is associated with the design control attribute of the Mitigating Systems cornerstone 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 has very low safety significance, based on Phase 1 of the SDP, because it did not represent the loss of No. 23 station battery safety function, based upon the team's verification of Entergy's revised calculations.

The finding has a cross-cutting aspect in the area of problem identification and resolution because Entergy failed to promptly identify the decrease in margin found in the No. 23 battery design calculations of record.

Inspection Report# : [2007007](#) (*pdf*)

**Significance:**  Dec 31, 2006

Identified By: NRC

Item Type: FIN Finding

**FAILURE TO IMPLEMENT CORRECTIVE ACTIONS TO CORRECT A DEGRADED CONDITION WHICH IMPACTED GAS TURBINE #1 RELIABILITY AND AVAILABILITY**

The inspectors identified a Green finding, in that, Entergy's corrective actions were inadequate to resolve a deficiency associated with the gas turbine 1 (GT-1) starting diesel. This deficiency was identified following a failure of GT-1 to start on February 7, 2005, and resulted in three subsequent failures. A corrective action was written to correct the deficient condition following the initial failure and was closed on June 22, 2005, with no actions taken based on a senior management decision to cancel preventive maintenance activities on the gas turbines due to pending system retirement. Entergy entered this issue into their corrective action program and installed a modification to the coolant system to prevent further trips due to this condition.

The inspectors determined that this finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, it impacted GT-1 reliability, in that, the deficiency resulted in multiple failures to start on demand after the condition was identified and the action to correct the condition was closed without being implemented. The inspectors evaluated the significance of this finding using Phase 1 of Inspection Manual Chapter (IMC) 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined that a Phase 2 evaluation was required because the finding represented an actual loss of safety function of a non-Technical Specification required train of equipment designated as risk significant per 10 CFR 50.65 for greater than 24 hours. The inspectors used the Risk-Informed Inspection Notebook for Indian Point Nuclear Generating Unit 2, to conduct the Phase 2 evaluation. The inspectors determined that 65 hours of unavailability were caused by the additional failures of GT-1 due to the starting diesel coolant system deficiency. The inspectors conservatively equated this cumulative unavailability time to the total exposure time and used an initiating events likelihood of less than three days. The Phase 2 approximation yielded a result of very low safety significance (Green).

The inspectors determined this finding had a cross-cutting aspect in the area of human performance because Entergy did not ensure that equipment and resources were available and adequate to assure reliable operation of GT-1. Specifically, Entergy did not minimize long-standing equipment issues and maintenance deferrals associated with the gas turbine system.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Dec 05, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

**FAILURE TO IDENTIFY A DEGRADED CONDITION OF AN AUXILIARY FEED WATER CHECK VALVE IN THE CORRECTIVE ACTION PROGRAM**

The inspectors identified a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," in that, Entergy failed to identify a condition adverse to quality associated with improper internal clearances on BFD-68, an auxiliary feedwater check valve, in the corrective action program. Specifically, upon inspection in September 2006, the gasket between the valve's body to bonnet seal was found over-crushed causing the gasket to partially unwind, potentially impacting valve operation. Gasket damage was noted in work orders during internal valve inspections of BFD-68 performed in 1997 and 2002; however, the deficiencies were not identified in the

corrective action program. Consequently, the problem was not evaluated and corrected prior to reassembly of the valve. Entergy entered this issue into the corrective action program, evaluated the condition, and conducted repairs to the valve to ensure the proper gasket crush was obtained.

The inspectors determined that this finding was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone; and, it affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of this finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined that the finding was of very low safety significance because it was not a design or qualification deficiency; it did not result in the loss of a system safety function or a train safety function for greater than the Technical Specification Allowed Outage Time; and it did not screen as potentially risk significant due to external events.

Inspection Report# : [2006006](#) (pdf)

**Significance:**  Dec 05, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **INADEQUATE EVALUATION OF LEAKING 22 STEAM GENERATOR LOW FLOW BYPASS VALVE FCV-427L**

A self-revealing, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified, in that, Entergy failed to adequately evaluate leakage into the 22 steam generator. During the Indian Point Unit 2 reactor trip on August 23, 2006, main feedwater low flow bypass valve FCV-427L leaked excessively and resulted in an uncontrolled rise in 22 steam generator level; operator response to isolate feedwater to the steam generator in accordance with emergency operating procedures; and automatic actuation of the feedwater isolation system. The excessive leakage condition into the 22 steam generator was identified on April 4, 2006, prior to Indian Point Unit 2 refueling outage 2R17, but was not fully evaluated or corrected prior to the reactor trip on August 23, 2006. This issue was entered into the corrective action program, and FCV-427L was repaired and retested satisfactorily.

The inspectors determined that this finding was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone; and, it affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of the finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," and determined that the finding was of very low safety significance because it was not a design or qualification deficiency; it did not result in the loss of a system safety function or a train safety function for greater than the Technical Specification Allowed Outage Time; and it did not screen as potentially risk significant due to external events.

The inspectors determined that the finding had a cross-cutting aspect in the area of problem identification and resolution because Entergy did not thoroughly evaluate the cause of excessive leakage into the 22 steam generator such that the resolutions addressed the causes and extent of condition of the problem.

Inspection Report# : [2006006](#) (pdf)

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## **Barrier Integrity**

**Significance:**  Mar 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

### **FAILURE TO MOVE CONTAINMENT HYDROGEN ANALYZERS TO 10 CFR 50.65 (A)(1) STATUS**

The inspectors identified a Green, NCV of 10 CFR 50.65(a)(2) because Entergy did not demonstrate that the performance or condition of the containment hydrogen monitoring system was being effectively controlled through the performance of appropriate preventive maintenance such that the system remained capable of performing its intended function. The inspectors identified that both channels of the containment hydrogen/oxygen (H<sub>2</sub>/O<sub>2</sub>) analyzers had been out of service since September 7, 2006, due to compressor seal leakage. The inspectors determined

that the H2/O2 analyzers are within the scope of Entergy's Maintenance Rule program since they are used in the emergency operating procedures. The inspectors noted that, based on the significant unavailability time of both trains, the system should have been in 10 CFR 50.65(a)(1) status with an action plan to improve system performance back to an (a)(2) status. Entergy entered this issue into their corrective action program and changed the priority of the work orders to perform repairs on the H2/O2 analyzers.

This inspectors determined that this finding affected the Barrier Integrity cornerstone and was more than minor since it was similar to Example 7.b in IMC 0612, Appendix E, "Examples of Minor Issues." Specifically, Entergy failed to demonstrate effective control of the performance of the H2/O2 analyzers and did not place the system in (a)(1) status. The inspectors evaluated the significance of this finding using Phase 1 of IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations." The finding required further evaluation through IMC 0609, Appendix H, "Containment Integrity Significance Determination Process," because it resulted in an actual reduction in the defense-in-depth for the hydrogen control function of the reactor containment. The inspectors determined that this finding was of very low safety significance because it did not affect core damage frequency and the H2/O2 analyzers are not important to large early release frequency.

The inspectors determined this finding had a cross-cutting aspect in the area of human performance because Entergy did not ensure that equipment and resources were available to assure reliable operation of the H2/O2 analyzers. Specifically, Entergy did not minimize long-standing equipment issues and maintenance deferrals associated with the containment hydrogen monitoring system. (Section 4OA2)

Inspection Report# : [2007002](#) (*pdf*)

**Significance:** SL-IV Dec 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

#### **INADEQUATE CONTAINMENT CLOSURE EQUIPMENT**

The inspectors identified a Severity Level IV NCV of 10 CFR 50.59, "Changes, Tests and Experiments," for failure to obtain a license amendment pursuant to 10 CFR 50.90 prior implementing a change to alter the requirements of a shutdown fission product barrier. The inspectors reviewed Safety Evaluation 04-0732-MD-00-RE R1, "Installation of a Temporary Roll-up Door on the Containment Equipment Hatch," to determine if the conclusion that a licensee amendment was not required was correct. Entergy concluded that the roll-up door was equivalent to the closure plate and, therefore, adequate to close containment as required by the action statement. The inspectors found that the door was not designed to be air-tight; therefore, any radioactive release inside containment would bypass the roll-up door. The inspectors concluded that the roll-up door did not meet the design or licensing basis of the closure plate as described in the Updated Final Safety Analysis Report (UFSAR) and previously approved license amendments. Consequently, Entergy incorrectly concluded that a license amendment pursuant to 50.90 was not required prior to implementing the change. Entergy entered the issue into their corrective action program to evaluate and correct.

The inspectors determined that Entergy changed the requirements for the shutdown fission product barrier (containment) prior to receiving NRC approval. As a result, traditional enforcement was used to evaluate the issue because the deficiency affected the NRC's ability to perform its regulatory function. The severity level of the violation was determined to be Severity Level IV in accordance with example D.5 of Supplement 1 of the NRC Enforcement Policy. Additionally, the issue was determined to be of very low safety significance (Green) based on the low decay heat levels at the time the roll-up door was credited in accordance with the significance determination process described in Inspection Manual Chapter (IMC) 0609 Appendix H, "Containment Integrity."

Inspection Report# : [2006005](#) (*pdf*)

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## **Emergency Preparedness**

**Significance:**  Mar 31, 2007

Identified By: NRC

Item Type: FIN Finding

#### **INADEQUATE CORRECTIVE ACTIONS FOR FAILURE TO APPROPRIATELY MONITOR SERVICE**

## WATER INTAKE BAY LEVEL

The inspectors identified a Green finding because Entergy failed to take adequate corrective actions for an issue associated with monitoring of service water intake bay level. This deficiency could have prevented identification of entry conditions for an emergency action level. Entergy entered this issue into the corrective action program as CR IP3-2007-00453, and initiated several corrective actions, including plans for enhanced monitoring of service water bay levels, backwashing of trash racks, procedural upgrades, correction of service water bay level instrumentation modification installation, development of modifications for enhanced service water level monitoring equipment, and enhanced inspection and cleaning of intake structure trash racks.

The inspectors determined that this finding was more than minor because it was associated with the Emergency Preparedness cornerstone attribute of facilities and equipment; and, it affected the cornerstone objective of ensuring that a licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, inadequate monitoring of service water intake bay level could have resulted in failure to declare a notification of unusual event (UE). The inspectors reviewed the EAL entry criteria and determined that this performance deficiency did not affect Entergy's ability to declare any event higher than a UE. The inspectors evaluated this finding using IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," Sheet 1, "Failure to Comply," and determined that it was of very low safety significance because the declaration of a UE based on low service water bay level could have been missed or delayed, consistent with the example provided in the appendix.

The inspectors determined that this finding had a cross-cutting aspect in the area of problem identification and resolution because Entergy did not implement effective corrective actions for a previously identified issue associated with inadequate monitoring of service water intake bay level. (Section 1R17)

Inspection Report# : [2007002](#) (*pdf*)

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## Occupational Radiation Safety

**Significance:**  Dec 31, 2006

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **FAILURE TO SURVEY AND PROVIDE ACCESS TO AN UNPOSTED HIGH RADIATION AREA**

A Green, self-revealing NCV of 10 CFR 20.1501 with respect to 10 CFR 20.1902(b) was identified, in that, Entergy failed to survey radiological condition changes after a plant manipulation that was likely to cause a change in radiological conditions, and this led to the failure to post a plant area as a high radiation area. As a result, two workers were allowed access to an unsurveyed and unposted high radiation area.

The finding is more than minor because it is associated with the Occupational Radiation Safety cornerstone attribute of exposure control and affected the cornerstone objective, because not establishing radiological conditions and commensurate controls after changing plant radiological conditions prior to allowing access to the affected areas can cause increased personnel exposure. The inspectors evaluated this finding using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," and determined that it was of very low safety significance (Green) because it did not involve ALARA planning and controls, an overexposure, a substantial potential for overexposure, or an impaired ability to assess dose. This issue was entered into Entergy's corrective action program and training was provided to the radiation protection staff.

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Entergy did not use a conservative assumption in the decision-making process, in that, the watch radiation protection technician did not question the radiological conditions of the pipe chase area after a change of plant conditions had occurred and did not require a survey of the pipe chase area before authorizing access to personnel.

Inspection Report# : [2006005](#) (*pdf*)

**Significance:**  Dec 31, 2006

Identified By: Self-Revealing

Item Type: FIN Finding

## **UNIT 2 CONTAINMENT SUMP STRAINER MODIFICATION COLLECTIVE EXPOSURE OVERRUNS DUE TO INADEQUATE MOD PREPARATION**

A self-revealing finding was identified that involved inadequate modification planning and construction preparations relative to a Unit 2 containment sump strainer modification that resulted in significant unplanned collective exposure (93.7 person-rem compared to a work activity estimate of 10.9 person-rem). Specifically, the actual job site conditions for installation of the containment sump modification were not adequately evaluated with respect to the radiological impact of increased occupancy in high dose rate work areas. This unplanned additional in-field high radiation work resulted in significant unintended exposure that could have been avoided. This issue was entered into Entergy's corrective action program so that lessons learned could be incorporated into the Unit 3 containment sump modification.

The inspectors determined that this finding was more than minor because it was similar to examples 6.a and 6.b of IMC 0612, Appendix E, "Examples of Minor Issues," in that, the issue involved actual collective exposure greater than 5 person-rem and was greater than 50 percent above the estimated or intended exposure; and the majority of the dose overrun was due to activities within Entergy's control. The inspectors evaluated this finding using IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," and determined that the finding was of very low safety significance (Green) because it involved an ALARA planning issue, and the 3-year rolling average collective dose for Unit 2 was less than 135 person-rem (73 person-rem average annual exposure for 2003 through 2005).

The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Entergy did not adequately incorporate job site conditions in the work control planning process.

Inspection Report# : [2006005](#) (*pdf*)

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## **Public Radiation Safety**

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## **Physical Protection**

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## **Miscellaneous**

**Significance:**  Dec 05, 2006

Identified By: NRC

Item Type: FIN Finding

## **FAILURE TO ENTER SAFETY CULTURE ASSESSMENT RESULTS INTO CORRECTIVE ACTION PROGRAM**

The NRC inspectors identified a finding when Entergy failed to initiate condition reports in accordance with EN-LI-102, "Corrective Action Process," for the adverse conditions identified in the 2006 Safety Culture Assessment. Consequently, the adverse conditions were not evaluated and appropriate corrective actions were not identified in a timely manner. The contractor who performed the independent safety culture assessment presented the site specific results to Entergy management in June 2006. The negative responses and declining trends identified in the assessment constituted adverse conditions that should have been entered into the corrective action program. At the time of the inspection, Entergy had not initiated condition reports for the assessment results. Consequently, the results had not been fully evaluated to understand the causes and identify appropriate actions to address the identified issues.

Additionally, organizations identified by the contractor as needing management attention had not developed departmental action plans at the time of the inspection. Entergy entered this issue into the corrective action program and initiated a learning organization condition report to track development and implementation of action plans to address the assessment results.

The inspectors determined that the finding was more than minor because if left uncorrected it would become a more significant safety concern. Without appropriate action, the weaknesses in the safety culture onsite would continue, increasing the potential that safety issues would not receive the attention warranted by their significance. The finding was not suitable for SDP evaluation, but has been reviewed by NRC management and has been determined to be a finding of very low safety significance. The finding was not greater than very low safety significance because the inspectors did not identify any issues that were not raised which had an actual impact on plant safety or were of more than minor safety significance.

The inspectors determined that this finding had a cross-cutting aspect in the area of problem identification and resolution because Entergy did not identify issues with the potential to impact nuclear safety in the corrective action process for evaluation and resolution in a timely manner.

Inspection Report# : [2006006](#) (*pdf*)

Last modified : December 07, 2007