

## Turkey Point 3

### 3Q/2006 Plant Inspection Findings

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## Initiating Events

**Significance:** **W** Aug 18, 2006

Identified By: NRC

Item Type: VIO Violation

#### **Failure to assess and manage maintenance risk during shutdown operations**

A violation of 10 CFR Part 50.65(a)(4) was identified for failure to adequately assess and manage the increase in risk of performing maintenance on the A-train 480 volt 3C load center while Unit 3 was operating in decay heat removal mode with one operating A-train residual heat removal (RHR) pump. The licensee elected to move up restoration maintenance on the A-train 480 volt 3C load center and proceeded without implementation of procedurally required measures to reduce the risk during the activity. During the maintenance activity the licensee installed a breaker associated with 3C 480 volt load center that was later determined to be defective, which caused a loss of the operating A-train RHR pump. This resulted in a loss of all decay heat removal for seven minutes, which caused reactor coolant temperature to increase from 113 F to 140 F. The finding affected the cross cutting area of Human Performance, specifically the Work Control component because the licensee did not appropriately plan work activities using risk insights. The licensee entered this issue in the Corrective Action Program as condition report (CR) 2006-7036.

The finding was greater than minor because the risk assessment failed to account for the loss of decay heat removal during shutdown operations. The Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capacity of systems that respond to initiating events to prevent undesirable consequences was affected by the finding. This finding was evaluated in accordance with NRC Inspection Manual Chapter 0609 Shutdown Appendix G Phase 1 and 2 Significance Determination Process (SDP) templates and determined to be greater than Green. Subsequently, a Phase 3 assessment was performed and determined that there were two dominant core damage sequences. One sequence involved failure of operators to start either RHR train A or B before boiling began. In this scenario, the operators were assumed to successfully initiate feed and bleed cooling but failed to maintain a long term inventory source to the refueling water storage tank (RWST) (recirculation requires the RHR pumps). The conditional core damage probability for this scenario was estimated as 3.5E-06. The other sequence involved failure of operators to start either RHR train A or B before boiling and the operators fail to initiate feed and bleed cooling before core damage, which was estimated to be 3E-6. Therefore, the risk significance of this finding was determined to be White.

The Final Significance Determination for A White Finding and Notice of Violation letter was issued on November 22, 2006. For administrative purposes, this letter is issued as a separate NRC Inspection Report (No. 05000250/2006016) and the above violation is identified as VIO 05000250/2006016-01, White Finding - Failure to Assess and Manage Maintenance Risk During Shutdown Operations. Accordingly, Apparent Violation (AV) 05000250/2006015-01 is closed.

Inspection Report# : [2006015\(pdf\)](#)

**Significance:** **G** Nov 30, 2005

Identified By: NRC

Item Type: FIN Finding

#### **Inadequate Condenser Slop Drain Modification Resulted in Loss of Condenser Vacuum and Manual Reactor Trip**

A finding was identified for a failure to adequately design and implement a condenser slop drain modification. The inadequate modification resulted in a failed weld that caused a loss of condenser vacuum and a manual reactor trip.

This finding is more than minor because it affected the design control and human performance attributes of the initiating events cornerstone objective of limiting the likelihood of events that upset plant stability by causing a loss of vacuum and manual reactor trip. The finding was of very low safety significance because it did not increase the likelihood that

mitigation equipment or functions would not be available. Because the affected equipment was non-safety related, no violation of regulatory requirements occurred. The direct cause of this finding involved the cross-cutting area of Human Performance.

Inspection Report# : [2005011\(pdf\)](#)

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## Mitigating Systems

**Significance:**  Sep 30, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to implement adequate corrective actions to prevent recurring deficiencies in flood protection barriers**

The inspectors identified a Green, non-cited violation (NCV) of 10 CFR 50 Appendix B, Criterion XVI, Corrective Actions, for failure to take actions to prevent repeated deficiencies with external flood protection equipment. Although deficiencies with wooden stoplogs had been identified and left uncorrected at the start of hurricane season in 2005, corrective actions were not sufficient to prevent recurring problems that extended into the hurricane season in 2006. The licensee entered the issue in their corrective action program and planned to replace the vulnerable wooden stoplogs with an aluminum design.

The finding is more than minor because it was repetitive and affected protection against external factors of systems in the Mitigating Systems Cornerstone. The finding screens to be of very low safety significance (Green) because the inspectors judged that the licensee would have successfully prevented loss of one or more trains of a system that supports a safety function had a maximum hurricane and flood occurred. The cause of the finding is related to the Problem Identification and Resolution cross-cutting area in that the licensee did not take appropriate corrective actions in a timely manner, following problems with flood barriers in 2005, to prevent recurring degraded barriers during the hurricane season in 2006

Inspection Report# : [2006004\(pdf\)](#)

**Significance:**  Mar 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to install jumpers during maintenance results in diesel inoperability**

A self-revealing non-cited violation of Technical Specification 6.8.1, Procedures, was identified during a loss of offsite power event on March 8, 2006, when both Unit 3 emergency diesel generators were made inoperable by installation of ground test devices on the Unit 3 startup transformer without adequate configuration control. The finding occurred when the licensee failed to implement the proper procedure for installation of the grounding devices and a control system jumper was left out of the circuitry. The cause of the finding was related to the cross-cutting element of human performance, specifically organization, in that the transformer work was not planned or conducted using the appropriate procedure.

The finding was more than minor because the operability of Mitigating System equipment was affected when the ground test devices were installed without the necessary jumpers. Because the failure did not represent an actual loss of safety function and was corrected by operator actions when the 3A emergency diesel generator was providing power to the 3A 4160 volt safety bus, the finding was determined to be of very low safety significance. (Section 1R20)

Inspection Report# : [2006002\(pdf\)](#)

**Significance:**  Feb 17, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Identify and Implement Effective Corrective Actions to Prevent Recurring Scaffolding Installation**

**Deficiencies**

The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the licensee's failure to identify and implement effective corrective actions for recurring problems related to the construction of scaffolding in the proximity of safety related equipment. For the examples identified the licensee either removed or adjusted the scaffolding to correct the condition.

This finding was determined to be more than minor because it was associated with the mitigating system cornerstone attributes of (1) protection against external factors such as a seismic event and (2) equipment performance such as reliability. In addition, the finding 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, while improperly installed scaffolding has the potential to adversely affect mitigation systems, the specific examples identified did not result in an actual loss of safety function of a mitigating system and did not render equipment inoperable due to a seismic event. This finding directly involved a cross-cutting aspect of problem identification and resolution, that being ineffective corrective actions.

Inspection Report# : [2006007\(pdf\)](#)

**Significance:** **G** Dec 31, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Correct Repeated Problems with Auxiliary Feedwater Pump Manual Speed Control**

The inspectors identified a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for failure of the licensee to correct a repeated condition adverse to quality, that being problems with operator's adjustment of auxiliary feedwater speed control.

The finding was more than minor and affected the Mitigating Systems cornerstone because the licensee failed to correct a longstanding problem with manual setting of the auxiliary feedwater speed control knob resulting in repeated inoperabilities. The finding was determined to be of very low safety significance because no instances of loss of function or periods of sustained inoperability beyond technical specification limitations were identified. The finding affects the cross cutting area of Problem Identification and Resolution due to the failure to resolve a known condition adverse to quality related to the problems with manual setting of auxiliary feedwater speed control. (4OA2.2)

Inspection Report# : [2005005\(pdf\)](#)

**Significance:** **W** Dec 31, 2005

Identified By: NRC

Item Type: VIO Violation

**AFW Pump B out of Service Greater than TS Allowed Due to Incorrect Bearing Installation**

An Apparent Violation (AV) of Technical Specification 3.7.1.2 was identified for an inoperable auxiliary feedwater pump with a contributing violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action" for failure of the licensee to promptly identify and correct a significant condition adverse to quality affecting the "B" turbine driven auxiliary feedwater (TDAFW) pump. Specifically, the "B" TDAFW pump exhibited high vibration during routine inservice tests following the replacement of the pump inboard journal bearing in September 2003. Periodic oil samples taken since 2003 were also abnormal and on occasion, the bearing was reported to have high temperature. Plant staff were aware of the continued high vibration but did not declare the pump inoperable and take corrective action. Subsequently, on November 7, 2005, a test of the "B" TDAFW pump was halted due to increasing vibrations above the inservice testing limit. The increased vibration was later determined by the licensee to be directly related to the pump inboard journal bearing that was installed incorrectly on September 10, 2003. The licensee entered this issue in the Corrective Action Program as condition report (CR) 2005-30750. (4OA3.3)

The finding was determined to be more than minor because the "B" TDAFW pump which is shared between Unit 3 and Unit 4, was inoperable more than 30 days. The Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capacity of systems that respond to initiating events to prevent undesirable consequences was affected by the finding. NRC Phase 1 and Phase 2 Significance Determination Process (SDP) analyses determined that this finding is potentially greater than Green because the "B" TDAFW pump was inoperable greater than 30 days and no operator recovery credit was identified. An SDP Phase 3 analysis was performed and concluded the issue was of low to moderate

safety significance, White. This finding is also related to the cross-cutting area of problem identification and resolution due to the failure to promptly resolve a known condition adverse to quality. (4OA3)

Final Significance Determination (SDP) for White Finding and Notice of Violation (NRC Inspection Report 05000250, 251/2006-010) were issued on April 17, 2006. Therefore, the AV was administratively closed.

Inspection Report# : [2005005\(pdf\)](#)

Inspection Report# : [2006003\(pdf\)](#)

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## Barrier Integrity

**Significance:**  Mar 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to ensure emergency operating procedure step is usable**

The inspectors identified a non-cited violation of Technical Specification 6.8.1.a, which requires that written procedures be implemented covering the activities recommended by Regulatory Guide 1.33, including procedures for procedure adherence. The violation was identified when a step in emergency operating procedure (EOP) E-3, Steam Generator Tube Rupture, was determined to not be usable as specified in the licensee's validation and verification plan. The licensee entered the deficiency into their corrective actions program and initiated a procedure change.

The finding was more than minor because it affected the ability to assure that a physical barrier (steam generator tubes) needed to protect the public from radionuclide releases was protected by prompt identification and isolation of a rupture. The Barrier Integrity Cornerstone was affected and the finding screened to be of very low safety significance because no steam generator ruptures had occurred at Turkey Point and no actual loss of safety function had occurred. (Section 1R11)

Inspection Report# : [2006002\(pdf\)](#)

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

**Significance:**  Mar 31, 2006

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to implement adequate quality controls to ensure representative sampling for particulates in the Plant Vent SPING**

The inspectors identified a non-cited violation of Technical Specification 6.8.1.e for failure to implement quality control activities consistent with guidance in Regulatory Guide 1.21 to maintain representative sampling and monitoring of particulates in the main Plant Vent effluents. Specifically, procedural changes made in February 2005 allowed for operation

of the main Plant Vent system particulate iodine noble gas (SPING) sampler outside of established isokinetic (representative) sampling design bases. Subsequently, the inspectors identified several occurrences in September 2005 where the main Plant Vent SPING flowrates resulted in nonrepresentative sampling conditions for effluent particulates. This finding was entered into the licensee's corrective action program. A contributing cause of the finding is related to the cross-cutting element of problem identification and resolution, specifically corrective actions, in that the licensee's corrective actions for a previous finding failed to evaluate the main Plant Vent and SPING RAD-6304 sampler flowrates for maintaining representative sampling throughout the entire procedural limit ranges specified in procedures.

This finding is greater than minor because it is associated with the Public Radiation Safety Cornerstone and affects the cornerstone objective of assuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. The failure to maintain isokinetic sampling conditions or otherwise account for nonrepresentative sampling conditions could result in inaccurate (impaired) measurement and reporting of airborne particulate radionuclides in samples and the resultant dose estimates. The finding was evaluated using the Public Radiation Safety Significance Determination Process (SDP) and was determined to be of very low safety significance (green) because there was no failure to assess dose to the public from airborne particulates released from the main plant vent and doses did not exceed Appendix I to 10 CFR Part 50 design criteria. (Section 2PS1).

Inspection Report# : [2006002\(pdf\)](#)

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## Physical Protection

[Physical Protection](#) information not publicly available.

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## Miscellaneous

**Significance:** N/A May 19, 2006

Identified By: NRC

Item Type: FIN Finding

### Supplemental Inspection 95001

This supplemental inspection was conducted in accordance with Inspection Procedure 95001, to assess the licensee's evaluation associated with; (1) the performance indicator for excessive safety system unavailability for the heat removal system (due to a degraded auxiliary feedwater pump) crossing the threshold from Green (very low risk significance) to White (low to moderate risk significance) for Units 3 and 4 in the fourth quarter of 2005, and (2) the White finding for the auxiliary feedwater pump B being out of service for greater than the technical specification allowed outage time due to an incorrectly installed bearing and subsequent inadequate corrective actions, NOV 05000250,251/2006010. Specifically, the Unit 3 and 4 shared "B" turbine driven auxiliary feedwater pump was discovered in a degraded condition on November 7, 2005. The licensee determined the pump had an incorrectly installed bearing which resulted in inadequate lubrication of the inboard pump bearing. The pump was determined to be inoperable and unable to meet its expected mission time from December 14, 2004 until November 11, 2005.

The licensee's problem identification, root cause and extent-of-condition evaluations, and corrective actions for the degraded pump were generally adequate. However, several deficiencies were identified by the inspector relating to the thoroughness and quality of the root cause evaluation and subsequent corrective actions. Of note, the root cause evaluation did not identify that an evaluation required by the ASME code was not completed when the auxiliary feedwater pump B was returned to service with high vibrations on September 3, 2003. Therefore, the White finding, NOV 05000250,251/2006010, will remain open pending development of corrective actions to address these NRC-identified weaknesses.

Inspection Report# : [2006013\(pdf\)](#)

**Significance:** N/A Feb 17, 2006

Identified By: NRC

Item Type: FIN Finding

### **Identification and Resolution of Problems**

The team concluded that in general problems were properly identified, evaluated, prioritized, and corrected within the licensee's problem identification and resolution program. One exception was noted regarding the failure to identify and implement effective corrective actions to prevent recurring scaffolding installation deficiencies. Additionally, the licensee has been challenged to thoroughly assess and correct the large increase in issues, since the threshold for problem identification was lowered when the new corrective action management program was implemented.

The processes and procedures of the licensee's corrective action program were generally adequate; thresholds for identifying issues were appropriately low, and in most cases, corrective actions were adequate to address conditions adverse to quality. Several negative observations were identified by the team including; an increasing trend in the number of licensee open corrective action items; CAP process timeliness goals not being met; problem evaluations lacking thoroughness for those issues not warranting a root cause or apparent cause evaluation; and a lack of risk assessment for significant maintenance in the switchyard.

Based on discussions and interviews conducted with plant employees from various departments, the inspectors did not identify any reluctance to report safety concerns.

Inspection Report# : [2006007\(pdf\)](#)

Last modified : December 21, 2006