Brunswick 2
4Q/2007 Plant Inspection Findings

Initiating Events

Significance: G Mar 31, 2007
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Incorrect Fuel Assembly Moved to Core
A self-revealing non-cited violation of Technical Specification 5.4.1, Administrative Controls (Procedures) was identified for failing to follow the Core Component Sequence Sheet for Refueling Outage B218R1 during fuel movement on Unit 2. This resulted in the incorrect fuel assembly being loaded in core location 11-14 which caused an unanalyzed change in core shutdown margin. This issue was entered into the corrective action program for resolution.

The finding was more than minor because it was associated with configuration control of Unit 2 core and affected the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety function during shutdown as well as power operations. The finding was assessed using the Significance Determination Process for Reactor Inspection Findings for Shutdown Operations and determined to be of very low safety significance (Green) because it did not contribute to a loss of decay heat removal or a loss of reactor coolant system inventory. This finding has a crosscutting aspect of Human Performance, Work Practices, because the incorrect fuel movement was the result of a human error which was not prevented by the use of self and peer checking human error prevention techniques (Section 1R20).

Inspection Report# : 2007002 *(pdf)*

Mitigating Systems

Significance: G Oct 15, 2007
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Corrective Action for Fisher Model 9100 Unbonded Butterfly Valve Failures
The inspectors identified an NCV of 10 CFR 50 Appendix B, Criterion XVI, for failure to promptly identify and correct a condition adverse to quality related to foreign material in the service water system (SW) resulting from Fisher butterfly valve rubber lining failures. There had been a number of failures of Fisher butterfly valve rubber linings since 1985 including a Unit 1 failure in 2004 and a Unit 2 failure in 2005. The examples in 2004 and 2005 were examples where valve lining material was missing from Fisher valves and all the material was not accounted for and removed from the SW system. On August 16, 2007, the licensee detected reduced flow from the 1B Residual Heat Removal (RHR) room cooler and on August 18, 2007, identified foreign material in the inlet piping to the cooler. Additional rubber lining material was also found in the 1 A RHR room cooler. An additional example of Fisher valve foreign material in the SW system was noted in 2005 in the Unit 2 2B Turbine Building Component Cooling Water Heat Exchanger. The licensee entered this issue into the corrective action program.

The failure to maintain the SW system free of foreign material was considered a performance deficiency and a finding in the mitigating systems cornerstone. This finding is greater than minor because it affected the availability and reliability of the RHR room coolers which support the emergency core cooling equipment used to mitigate the consequences of an accident. Although related to degradation in the service water system, the finding is of very low safety significance because the licensee detected the change in SW flow and removed the material prior to the flow reduction reaching the minimum required flow for accident mitigation. There was no loss of safety function from either train of service water. This finding has an appropriate and timely corrective action aspect in the cross-cutting area of problem identification and resolution because the licensee failed to recognize the foreign material as a

condition adverse to quality and implement timely corrective action to locate the source of and remove all the material from the SW system
Inspection Report# : 2007011 *(pdf)*

Significance: G Sep 30, 2007
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Diesel Generator Trip Due to Failure to Follow Procedure
A self-revealing Green non-cited violation (NCV) of Technical Specification 5.4.1 was identified for failure to follow the Diesel Generator monthly load test procedure (0PT-12.2D) which resulted in Diesel Generator number 4 tripping on reverse power and locking out. This issue was entered into the corrective action program for resolution.

The finding was more than minor because it was associated with the equipment performance attribute of the mitigating system cornerstone objective of ensuring the availability of systems that respond to initiating events. The finding was assessed using the Significance Determination process and determined to be of very low safety significance (Green) because it did not contribute to a loss of the Diesel Generator safety function for greater than its technical specification allowed time. This finding was related to the human performance and error prevention aspect of the crosscutting area of human performance because the Diesel Generator tripping on reverse power and locking out was the result of a human error due to the failure to properly use self and peer checks (H.4.a). (Section 1R22)

Inspection Report# : 2007004 *(pdf)*

Significance: G Jun 30, 2007
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Incorporate Operating Experience into Plant Procedures and Training
A self-revealing non-cited violation of 10CFR50, Appendix B, Criterion XVI, Corrective Action, was identified for failing to incorporate operating experience into appropriate precautions and operating limitations for single recirculation loop operation into plant procedures and training. As a result, Unit 2 experienced an automatic reactor scram on December 25, 2006 due to actuation of the Neutron Monitoring Oscillation Power Range Monitors while in single recirculation loop operation.

The finding was more than minor because it was associated with equipment performance and affected the Initiating Events Cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety function during power operations. The finding was assessed using the Significance Determination Process for Reactor Inspection Findings for At-Power Situations and determined to be of very low safety significance (Green) because, although the finding contributed to the likelihood of a reactor trip, it did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding has a crosscutting aspect in the area of Problem Identification and Resolution, specifically because the licensee did not implement appropriate changes to plant procedures and training programs to address operating experience that was reviewed (Section 4OA2.2).

Inspection Report# : 2007003 *(pdf)*

Significance: N/A Apr 13, 2007
Identified By: NRC
Item Type: FIN Finding
95001 Supplemental Inspection
The U.S. Nuclear Regulatory Commission (NRC) performed this supplemental inspection in accordance with Inspection Procedure 95001, to assess the licensee's evaluation associated with the Unit 1 and Unit 2 performance indicators in the mitigating systems cornerstone. The mitigating systems performance indicator (MSPI) for emergency AC power systems crossed the threshold from Green (very low risk significance) to White (low to moderate risk significance) in the second quarter of 2006. Specifically, the licensee's emergency AC power systems MSPI value reached 2.01E-6 for Unit 1 and 1.50E-6 for Unit 2. The MSPI becomes White when the value reaches 1.0E-6. The MSPI for Units 1 and 2 consist of an unreliability index based on emergency AC power system function failures and an unavailability index based on emergency AC power system unavailability. Since the vast majority of the contribution to the MSPI for Units 1 and 2 is from the unreliability indexes, the inspection focused on the emergency

AC system functional failures.

The inspector determined that the licensee performed a comprehensive evaluation of the conditions that led to the MSPI exceeding the Green/White threshold. Performance deficiencies were identified by the NRC during previous inspections and are listed in subsequent sections of this report. In addition, the licensee adequately analyzed the circumstances associated with those issues and, where appropriate, took effective immediate corrective action. Also, the licensee developed corrective actions to prevent recurrence. The inspector noted that additional failures of the emergency diesel generators have occurred subsequently to the failures included in the scope of this inspection. These failures will be further evaluated by the NRC outside of this inspection.

Inspection Report# : 2006008 *(pdf)*

Significance:  Feb 23, 2007
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Adequately Evaluate and Correct Condition Adverse to Quality Resulting in 2C CSW Pump Failure
A self-revealing, non-cited violation of 10CFR50, Appendix B, Criteria XVI, "Corrective Action," was identified for the failure to take adequate corrective actions to prevent a failure of the 2C Conventional Service Water (CSW) pump on July 26, 2006, due to corrosion of the pump shaft coupling. Specifically, the licensee failed to implement timely preventive maintenance to inspect the condition of pump shaft based on previous indications of pump shaft corrosion. The licensee entered the deficiency into their corrective action program as Action Request 201240 and completed inspections of the remaining pumps susceptible to similar corrosion.

The finding is more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and affects the cornerstone objective of ensuring the availability of systems that respond to initiating events. The failure of the 2C CSW pump shaft coupling affected the availability of the CSW system. Using the Phase 1 worksheet in Manual Chapter 0609, "Significance Determination Process," the finding is determined to be of very low safety significance because it is not a design or qualification deficiency, does not result in an actual loss of service water safety function, and does not screen as potentially risk significant for external events. The contributing cause of this finding involved the appropriate and timely corrective actions aspect of the Problem Identification and Resolution cross-cutting cornerstone (4OA2.a.(3)(i)).

Inspection Report# : 2007007 *(pdf)*

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

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.

Miscellaneous

Significance: N/A Feb 23, 2007
Identified By: NRC
Item Type: FIN Finding
Corrective action program
The team concluded that in general, problems were adequately identified and evaluated, and effective corrective actions were implemented. The team found that established thresholds for identifying and classifying issues were appropriately low. However, several instances were identified where adverse conditions were not adequately evaluated and corrective actions were not implemented in a timely manner to prevent recurrence of equipment related problems. Corrective action program goals for completing evaluations and implementing corrective actions were sometimes not met because of competing priorities and lack of management enforcement of timeliness goals. One NCV was identified involving ineffective and untimely corrective actions associated with the failure of a conventional service water pump due to shaft corrosion.

Operating experience was adequately evaluated for applicability to the plant, however, several examples were identified where external operating experience was not used effectively, such as with industry material corrosion controls, which resulted in service water pump and valve stem equipment failures prior to the implementation of appropriate preventive maintenance. The licensee's audits and self-assessments were effective at identifying issues and entering them into the corrective action program. These audits and assessments identified issues similar to those identified by the NRC with respect to repetitive significant equipment failures due in part to untimely and ineffective implementation of preventive maintenance. Based on discussions with licensee employees during the inspection, personnel felt free to report safety concerns.

Inspection Report# : 2007007 *(pdf)*

Last modified : February 04, 2008