

Brunswick 1

1Q/2008 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance:  Feb 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Adequately Evaluate and Correct a Condition Adverse to Quality Involving Service Water Fouling of the 1A RHR Heat Exchanger

The inspectors identified a Green non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the inadequate evaluation and corrective actions to address a condition adverse to quality involving degraded performance of the 1A Residual Heat Removal (RHR) Heat Exchanger (HX) due to Service Water (SW) fouling. The licensee documented this issue in their corrective action program as nuclear condition report 268318. The licensee also performed an operability evaluation of the RHR system, and instituted compensatory measures until the condition could be corrected during the Spring 2008 Unit 2 outage.

The finding is more than minor because if left uncorrected, the issue would become a more significant safety concern in that the potential existed for making the 1A RHR HX inoperable due to tube sheet fouling. In addition, the inspectors also determined that this issue was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was determined to be of very low safety significance because the degraded condition did not actually result in a loss of the RHR system safety system function. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution because the licensee did not take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity, in that the licensee did not promptly address an adverse trend in the 1A RHR HX's performance. (P.1.(d))

Inspection Report# : [2008006 \(pdf\)](#)

Significance:  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:  Oct 15, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Loose Parts Analysis / Operability Evaluation for Fisher Butterfly Valve Taper Pin

The inspectors identified an NCV of 10 CFR 50 Appendix B, Criterion V, for an inadequate loose parts analysis / operability evaluation performed following the failure of SW valve 1-SW-V105 to open on July 26, 2005, due to the loss of both taper pins which connected the stem to the valve disc. Inadequate testing of the impact of a butterfly valve taper pin on an operating RHR SW booster pump and incorrect communication of the results of this testing led to returning the SW system to service without retrieving the second taper pin. The pin was later retrieved when on August 21, 2007, the pin caused a failure of the 1D RHR SW booster pump. The licensee entered the issue into the corrective action program, removed the pin from the pump, replaced the motor and returned the pump to operable status.

The inadequate loose parts analysis / operability evaluation for the missing SW butterfly valve taper pin was considered as a performance deficiency and a finding in the mitigating systems cornerstone. This finding is greater than minor because it affected the reliability and availability attribute of one RHR SW booster pump, a mitigating system component. The finding was of very low safety significance because only one RHR SW booster pump was affected, it did not represent a loss of a safety function of either train of service water. This finding has a thorough evaluation of an identified problem in the cross-cutting area of problem identification and resolution because the licensee failed to thoroughly evaluate the condition adverse to quality which resulted in additional unavailability of the 1D RHR SW booster pump.

Inspection Report# : [2007011](#) (pdf)

Significance:  Aug 30, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Goal Setting and Monitoring not Performed for an Emergency Diesel Generator

The team identified a Green non-cited violation (NCV) of 10 CFR 50.65 (maintenance rule) for failure to demonstrate that the performance or condition of structures, systems, or components is being effectively controlled through the performance of appropriate preventive maintenance. An inadequate maintenance rule evaluation was performed after an emergency diesel generator exceeded its maintenance rule (a)(2) performance criteria and, as a result, goal setting and monitoring was not performed as required by Paragraph (a)(1) of the maintenance rule.

This finding was more than minor because it was associated with the equipment performance attribute and affected the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The lack of proper attention by the maintenance rule program to the degraded performance of Emergency Diesel Generator 3 allowed degraded performance to continue for all emergency diesel generators. This finding was of very low safety significance because it was not a design or qualification deficiency, did not directly result in an actual loss of safety function for a system or train, and was not risk significant due to a seismic, fire, flooding, or severe weather initiating event. The cause of the finding directly involved the cross-cutting area of human performance, in the decision making component under the aspect of using conservative assumptions because the expert panel decided to keep Emergency Diesel Generator 3 under maintenance rule Paragraph (a)(2) without fully supporting that conclusion. The licensee made this decision even though other evidence indicated that preventive maintenance was not effectively controlling Emergency Diesel Generator 3 performance [H.1(b)].

Inspection Report# : [2007010](#) (pdf)

Significance: N/A Apr 13, 2007

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*)

Barrier Integrity

Significance:  Feb 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Correct a Condition Adverse to Quality Involving an MSIV Design Deficiency

The inspectors identified a Green non-cited violation of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, for failure to correct a condition adverse to quality (i.e., design deficiency) which led to multiple and repetitive failures of the main steam isolation valves (MSIVs). The March 2007 failure of the 2-B21-F028A outboard MSIV to pressurize during local leak rate testing (LLRT) exhibited similar symptoms to previous MSIV failures which occurred over the period from 2003 to 2006. The inspectors identified a number of missed opportunities by the licensee to properly identify and correct the failure mechanism (i.e., design deficiency) which led to the most recent failures. The licensee has entered this issue into the corrective action program as nuclear condition report 267744, and was evaluating their plans to improve MSIV performance.

This finding is of greater than minor safety significance because it was associated with the Containment Barrier Performance attribute of the Barrier Integrity Cornerstone, and adversely affected the cornerstone objective of containment isolation reliability to protect the public from radiological releases caused by accidents or events. The finding was determined to be of very low safety significance because there was no loss of safety function (i.e., simultaneous failure of both the inboard and outboard MSIVs) that resulted in an actual open pathway in the physical integrity of containment. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution because the licensee did not take appropriate corrective actions to address safety issues and adverse trends in a timely manner, commensurate with their safety significance and complexity, regarding an adverse trend of continuing MSIV LLRT failures. (P.1.(d))

Inspection Report# : [2008006](#) (*pdf*)

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

Last modified : June 05, 2008