Brunswick 1
2Q/2007 Plant Inspection Findings

Initiating Events

Mitigating Systems

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: W Feb 28, 2007
Identified By: NRC
Item Type: VIO Violation
Failure to Meet TS 3.8.1, AC Sources-Operating
A preliminary White finding with an apparent violation (AV) of Technical Specification (TS) 3.8.1, AC Sources-Operating, was identified for Unit 1. The finding involved inadequate corrective actions to prevent a repeat failure of the #9 main crankshaft bearing on EDG #1, a failure to follow the foreign material exclusion control procedure during maintenance performed on EDG #1, and the failure to promptly identify and implement adequate actions to prevent emergency diesel generator (EDG) #1 from tripping on low lubricating oil pressure. The finding was determined to be a Green non-cited violation for Unit 2. The difference in risk significance between the units is due to differences in electric bus loads. This finding has a cross-cutting aspect in the area of Problem Identification and Resolution, in that lubricating oil strainer high differential pressure due to clogging by fibrous lint material was not promptly identified as a condition adverse to quality in a timely manner commensurate with the potential safety significance.

This finding is more than minor because it is associated with the availability and reliability of EDG #1 to mitigate events such as a loss of offsite power (LOOP) and primarily affected the Mitigating System Cornerstone for Units 1 and 2. Because the finding also affected the Initiating Events Cornerstone (i.e., LOOP with Loss of One AC Division) and represented an actual loss of safety function of EDG #1 for greater than the TS allowed outage time for one EDG (i.e., seven days), a Significance Determination Process Phase 2 analysis was performed. The dominant core damage

sequence in the Phase 2 was LOOP and LOOP with Loss of One AC Division. The results of the Phase 2 analysis required a Phase 3 evaluation. Phase 3 assessments for Units 1 and 2 were performed with the assumption that EDG # 1 was out of service for 130 hours. The Phase 3 analysis results for the internal event initiators calculated a change in Core Damage Frequency (delta CDF) of 1.3E-6 / year for Unit 1 and CDF of 1.57E-7 for Unit 2. In addition, evaluation of external event initiators and large early release frequency (LERF) for both units did not change the color. The finding is of low to moderate safety significance (White) for Unit 1, and is of very low safety significance (Green) for Unit 2.
(IR 05000325,324/2007-008 dated February 28, 2007)

The finding was determined to be of low to moderate safety significance (White) based on assuming a loss of offsite power initiating event and EDG #1 being in a degraded condition for approximately 3 days and in a nonfunctional condition for approximately 5 days.
(IR 05000325, 324/2007-009 dated April 20, 2007)

Inspection Report# : 2007008 *(pdf)*

Significance: G Dec 31, 2006
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Follow Work Management Process
A self-revealing non-cited violation of Technical Specification 5.4.1, Administrative Controls (Procedures), was identified for failing to follow the work management process for the performance of minor maintenance. Minor maintenance was performed on a Unit 1 instrument air isolation valve to a control rod hydraulic control unit without obtaining senior reactor operator approval. During the maintenance, the valve was inadvertently closed which isolated air to the hydraulic control unit and the associated control rod scrammed. As a result, control room operators were challenged by the reactivity event and subsequent power maneuvers to restore the control rod to the proper position. This issue was entered into the corrective action program for resolution.

The finding was more than minor because it is 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 functions during power operations. This finding is of very low safety significance because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment or functions would not be available. This finding had a crosscutting aspect of Human Performance because the control of the work did not keep operations personnel apprised of work status or the potential operational impact of the work activities (Section 1R12.2).

Inspection Report# : 2006005 *(pdf)*

Significance: G Dec 31, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Periodically Calibrate Service Water Pump Discharge Pressure Gages
An NRC-identified non-cited violation of 10CFR50, Appendix B, Criteria XII, Control of Measuring and Test Equipment, was identified for failing to periodically calibrate the Units 1 and 2 service water pump discharge pressure gages. As a result, the quality of the test data collected from the gages, used to satisfy ASME Section XI in-service test requirements and performed to demonstrate pump operability, was compromised. This issue was entered into the corrective action program for resolution.

The finding was more than minor because it was associated with service water pump equipment performance and affected the Mitigating System Cornerstone objective to ensure the capability of system that respond to initiating events to prevent undesirable consequences. In addition, if left uncorrected the finding could potentially become a more significant safety concern because the issue affected all the site’s service water pumps and degraded pump performance could go undetected. The finding was determined to be of very low safety significance (Green) because it did not result in the loss of safety function of a service water pump (Section 1R22.2).

Inspection Report# : 2006005 *(pdf)*

Barrier Integrity

Significance: G Sep 30, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Follow Condenser Air Removal and Off-gas Recombiner System Procedure
An NRC-identified non-cited violation of Technical Specification 5.4.1, Administrative Controls (Procedures), was identified for the failure to adhere to procedure requirements when operators injected service air into the steam jet air ejectors and the offgas flowpath. The initial condition that the service air injection was needed for continued hydrogen water chemistry operation was not met. As a result of this procedure adherence deficiency, the licensee had reduced the ability to monitor for actual fuel cladding damage. The licensee entered the issue into the corrective action program, secured air injection to the steam jet air ejector, and deleted the instructions which allowed service air injection to the steam jet air ejectors.

This finding is more than minor because it involved adherence to procedures associated with fuel cladding integrity and affected the Barrier Integrity Cornerstone to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding was determined to be of very low safety significance because it was only associated with the ability to monitor fuel barrier integrity. This finding was related to the cross-cutting area of Human Performance because the cause was due to failure to adhere to procedures.
Inspection Report# : 2006004 *(pdf)*

Emergency Preparedness

Significance: G Sep 30, 2006
Identified By: NRC
Item Type: NCV NonCited Violation
Potential Reduction in Effectiveness of Emergency Plan
An NRC-identified non-cited violation of 10 CFR 50.54(q) was identified for the failure to determine if the introduction or the increasing of air into the offgas flowpath for the purpose of reducing steam jet air ejector radiation monitor readings would reduce the effectiveness of the site Emergency Plan. The deficiency associated with this finding is that a 50.54(q) review was not performed to determine if there would be a potential reduction in the effectiveness of the site Emergency Plan because emergency action level classifications for both an Unusual Event and an Alert are based on radiation level readings from the steam jet air ejector radiation monitor. The procedure change which allowed the introduction of air into the offgas flowpath, and the implementation of the procedure on June 1, 2006 did not have associated 50.54(q) reviews.

The finding was greater than minor because it is associated with the Emergency Preparedness Cornerstone and potentially affected the program elements of 10 CFR 50.54(b)(4). The finding was of very low safety significance because the licensee performed an analysis of the potential affects of the range of airflow rates on the radiation monitor readings which demonstrated that the emergency action level values would not have been detrimentally affected.
Inspection Report# : 2006004 *(pdf)*

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 : August 24, 2007