

McGuire 2

3Q/2008 Plant Inspection Findings

Initiating Events

Mitigating Systems

W
Significance: Aug 20, 2008

Identified By: NRC

Item Type: VIO Violation

Failure to Take Adequate Corrective Action for Implementation of Safety-Related RN Strainer Backwash

10 CFR 50 Appendix B Criterion XVI, Corrective Action, states that measures shall be established to assure that conditions adverse to quality, such as deficiencies, deviations, and non-conformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. This requirement is implemented through the Duke Quality Assurance Program Topical Report and procedure NSD 208, Problem Identification Process.

Contrary to the above, between 2003 and August 7, 2007, the licensee failed to correct a significant condition adverse to quality related to macro-fouling of the nuclear service water (RN) strainers, in that the corrective action that was implemented failed to ensure that the design and licensing basis required capability for manual strainer backwash be maintained during accident conditions. Specifically, the 2003 plant modification that was implemented to address macro-fouling (i.e., upgrade and reclassification of the strainer backwash function to safety-related): (1) utilized non-safety-related instrument air (VI) to maintain each RN pump's strainer backwash discharge valve open, but did not provide a means to manually open (or bypass) the discharge valve to support backwash operations upon a loss of VI; and (2) did not account for the impact on timely operator response from higher strainer macro-fouling rates and expected (nuisance) strainer differential pressure alarms (without fouling) at the onset of high RN flow events (i.e., safety injection (SI) and loss of VI). As such, there was a lack of reasonable assurance that the RN system would be able to perform its safety-related function upon a SI or loss of VI event during periods of macro-fouling.

This violation is associated with a White finding for Units 1 and 2.

Inspection Report# : [2008009](#) (*pdf*)

Significance: SL-IV Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Update the FSAR to Reflect Those Portions of RN Shared Between Units (Section 1R11.1)

The inspectors identified a non-cited violation of 10 CFR 50.71(e) for the failure to update the Updated Final Safety Analysis Report (UFSAR) to include information related to those portions of the nuclear service water (RN) system that are shared between Units, as reflected in License Amendments issued for both Units on January 4, 1988.

This issue was greater than minor because the failure to include in the UFSAR the designation of which portions of the RN system were shared between units, as described in the License Amendments, was material to the NRC's review of the licensee's response to Generic Letter 91-13, Request for Information related to the Resolution of Generic Issue 130, "Essential Service Water System Failures at Multi-Unit Sites." The licensee's response revealed that they had procedures that allowed sharing of the RN discharge, which was specifically designated as not shared in Figure 7-1 of the Technical Specifications. As such, the UFSAR could not be relied upon to determine the shared portions and their safety implications. However, the inspectors found no subsequent changes made to the facility that were based on the erroneous information in the UFSAR section. Consequently, this issue was considered to meet the criteria of a severity level IV violation. This finding has a cross-cutting aspect of thorough evaluation in the area of problem identification and resolution [P.1.(c)]. (Section 1R11.1)

Inspection Report# : [2008003](#) (*pdf*)

G**Significance:** Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Scope Main Feedwater Tempering Line Valves Into the Maintenance Rule Monitoring Program (Section 1R12)

The inspectors identified a non-cited violation of 10 CFR 50.65(b)(2)(i) for failure to scope the credited main feedwater tempering lines (one per steam generator) and associated valves into the Maintenance Rule monitoring program.

This finding was more than minor because, similar to Example 7.d of NRC Inspection Manual Chapter (IMC) 0612 Appendix-E, "Examples of Minor Issues," effective control of component condition could not be demonstrated, since the appropriate preventative maintenance was not being performed due to not being scoped into the Maintenance Rule monitoring program. The licensee satisfactorily tested the functionality of the eight manual valves (two per tempering line) on each unit within the past few years, providing reasonable assurance that the manual valves would operate as required if needed. However, the functionality of the four check valves (one per tempering line) on each unit and the associated flow paths could not be demonstrated at this time; but, the licensee did perform an evaluation of all potential failure mechanisms and determined that the check valves would likely perform their function. The inspectors determined this finding to have very low safety significance, using NRC IMC 0609.04 "Phase 1 Initial Screening," in that this finding did not represent an actual loss of safety function for equipment designated as risk significant per 10 CFR 50.65, and was not risk significant for external initiating events. (Section 1R12)

Inspection Report# : [2008003](#) (*pdf*)**G****Significance:** Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Establish and Maintain Abnormal Procedures for Loss of Nuclear Service Water (Section 1R11)

The inspectors identified a non-cited violation (NCV) of Technical Specification (TS) 5.4.1.a. for failure to adequately establish and maintain procedures required by Regulatory Guide 1.33, Appendix A, Section 5, Procedures for Abnormal Conditions. Specifically, loss of nuclear service water (RN) procedures were not established and maintained with an adequate safety analysis for the sharing of nuclear service water between units.

This finding is more than minor because it affects the availability, reliability, and capability of the RN system (ultimate heat sink) and is related to the design control and procedure quality attributes of the mitigating systems cornerstone. In addition, this finding could be reasonably viewed as a precursor to a significant event (i.e. loss of RN on both units). The issue was determined to be of very low safety significance in IMC 0609 SDP Phase 1 screening based on the fact that this finding did not represent an actual loss of system safety function nor a loss of a single train of RN for greater than its Technical Specification allowed outage time, because these procedural steps had never been used. This finding has a cross-cutting aspect of resources in the area of human performance [H.2.c] because the licensee failed to ensure that procedures had complete, accurate and up-to-date design documentation to assure nuclear safety. (Section 1R11)

Inspection Report# : [2008002](#) (*pdf*)**G****Significance:** Mar 31, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Implement Foreign Material Exclusion Control Procedures (Section 1R13)

A self-revealing NCV of TS 5.4.1.a. for failure to adequately implement procedures required by Regulatory Guide 1.33, Appendix A, Section 9, Procedures for Performing Maintenance, was identified. Specifically, foreign material exclusion control procedures as described in work orders were not implemented.

This finding is more than minor because it affects the availability, reliability, and capability of one train of the RN system (ultimate heat sink) and is related to the human performance and procedure quality attributes of the mitigating systems cornerstone. This finding was considered self-revealing because the foreign material (i.e., diver's knife) was discovered in the 2A RN strainer as a result of the loss of safety equipment functionality. Data related to the frequency of high RN strainer differential pressure alarms was reviewed by the NRC staff for the seasonal macro-fouling periods of 2006 and 2007 to determine the total actual exposure time that macro-fouling occurred. Based on the data, a collective period of less than 30 days was selected as a conservative, bounding exposure number to determine the significance of the collective seasonal macro-fouling for the period from 2006 until January 28, 2008. The issue is of very low safety significance based on review IMC 0609 Appendix A pre-solved risk tables for loss of one train of nuclear service water for less than 30 days. This finding has a cross-cutting aspect of decision making in the area of human performance [H.1.b] because the licensee failed to use conservative assumptions in decision making when deciding not to implement foreign material procedures. (Section 1R13)

Inspection Report# : [2008002](#) (*pdf*)**G****Significance:** Mar 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Nuclear Service Water System Flow Analysis Deficiencies (Section 40A5.2)

The inspectors identified a NCV of 10 CFR 50, Appendix B, Criterion III, Design Control, for failure to establish measures to verify the design capability of the RN pumps. Specifically, the licensee did not perform system hydraulic analyses or use other means to demonstrate that RN pumps 1A and 1B could perform their safety function under the most limiting design basis conditions.

This finding is more than minor because it affected the design control attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors assessed the finding using the SDP and determined that the finding was of very low safety significance because subsequent engineering analysis, completed in March 2008, demonstrated there was no loss of RN system safety function capability when the worst case design basis accident (DBA) limiting values were input into the RN system flow analysis. (Section 40A5.2)

Inspection Report# : [2008002](#) (*pdf*)

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Significance: Nov 02, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Take Adequate Corrective Action For A Nonconformance Associated With ECCS Throttle Valves.

The purpose of this letter is to provide you with the Nuclear Regulatory Commission's (NRC's) final significance determination for a finding at Duke Power Company's (Duke) McGuire Nuclear Station (MNS) involving the failure to take adequate corrective actions for an identified nonconformance. This nonconformance involved the discovery that the emergency core cooling system (ECCS) cold leg injection throttle valves had the potential for clogging during high pressure recirculation because their narrow plug-to-seat clearances were smaller than the ECCS sump screen openings. More specifically, Duke's corrective action failed to adequately implement credited inspections of the inside of the ECCS sump. This was evidenced by the 2006 discovery, during an unrelated inspection, of a significant amount of aged yellow duct tape inside the Unit 2 ECCS sump around the suction and guard pipe of both ECCS trains. As documented in our Choice Letter dated September 10, 2007, this finding was assessed under the significance determination process as a preliminary greater than Green issue (i.e., an issue of at least low to moderate safety significance), as well as identified as an apparent violation (AV 05000370/ 2007008-01) of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action.

The NRC has determined that it is not likely that the two HHI throttle valves which are 2.75 turns open would clog to the point of precluding sufficient decay heat removal. As such, it has been concluded that the inspection finding is appropriately characterized in the mitigating systems cornerstone as having very low safety significance (Green). This final significance determination should not be construed as minimizing the importance of maintaining ECCS sump foreign material exclusion. Rather, it reflects how fortuitous it was that the foreign material consisted entirely of soft debris and that MNS has robust ECCS pump and ND heat exchanger designs, as well as the redundancy of both an IHI and HHI system (the latter of which has two of its four throttle valves approximately 2.75 turns open).

Additionally, the finding was also determined to be a violation of NRC requirements, as delineated in the Choice Letter and presented during the regulatory conference (see Enclosure 2). As previously addressed in the Choice Letter, this finding has a cross-cutting aspect of appropriate corrective actions in the area of problem identification and resolution (Inspection Manual Chapter 0305, Section 06.07, P.1.(d)), and is reflective of the importance in properly implementing established engineering processes to ensure plant licensing and design bases are maintained when dispositioning conditions adverse to quality.

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

Barrier Integrity

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Significance: Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Pre-conditioning of Unit 2 MSIVs Prior to Surveillance Testing (Section 1R22)

The inspectors identified a non-cited violation of Technical Specification (TS) 5.4.1.a for failure to establish an adequate procedure to test main steam isolation valves (MSIVs). Specifically, written test control procedures did not prevent and, therefore, resulted in pre-conditioning

of the valves prior to their surveillance requirement stroke time testing.

This finding is more than minor because the use of test procedures that allow preconditioning, if left uncorrected, could become a more significant safety concern. Inspection Manual Chapter 9900 Section C.1.c defines pre-conditioning as the alteration, variation, manipulation, or adjustment, of the physical condition of structures, systems and components (SSCs) before TS surveillance or ASME code testing. Pre-conditioning can affect the acceptability of test results and can have a direct effect on the determination of operability of the affected system or component by masking the true as-found condition. As such, this issue also affects the barrier integrity cornerstone objective of maintaining containment functionality and the associated attributes of SSC barrier performance, and procedure quality, by affecting the determination of operability related to the containment isolation function of the MSIVs. This issue is of very low safety significance because there was insufficient information to show that the MSIVs were inoperable during the short period of time that they were required in Modes 3, 2 and 1; therefore, it did not represent an actual open pathway in the physical integrity of the containment. This finding has a cross-cutting aspect of decision making in the area of human performance [H.1.(b)]. (Section 1R22)

Inspection Report# : [2008003](#) (*pdf*)

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Significance: Dec 31, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to take adequate corrective action for ensuring containment spray isolation valve thrust capacity.

The inspectors identified a self-revealing NCV of 10 CFR 50, Appendix B, Criterion XVI, for inadequate corrective action associated with the prevention of exceeding the thrust capacities of containment spray (NS) isolation valves (due to differential pressure), which could have prevented the NS system from performing its intended safety function.

This issue is more than minor because it affects the availability, reliability, and capability of the NS system and is related to the equipment performance and procedure quality attributes of the mitigating systems cornerstone. This finding was considered self-revealing because a temporary gauge installed to detect cross-train pressurization during NS pump runs revealed the unexpected existence of significant cross-system leakage from the residual heat removal (ND) system. The issue is of very low safety significance based on review IMC 0609 Appendix H, which indicates that containment spray does not impact large early release frequency for pressurized water reactor plants. This finding has a cross-cutting aspect of decision making in the area of human performance (H.1.b). (Section 1R22)

Inspection Report# : [2007005](#) (*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

Significance: N/A Aug 29, 2008

Identified By: NRC

Item Type: FIN Finding

McGuire PI&R

The team concluded that, in general, problems were properly identified, evaluated, prioritized, and corrected. The licensee was effective at identifying problems and entering them into the corrective action program (CAP) for resolution. The licensee maintained a low threshold for identifying problems as evidenced by the large number of Problem Investigation Process reports (PIPs) entered annually into the CAP. Generally, the licensee properly prioritized and evaluated issues, formal root cause evaluations for significant problems were thorough and detailed, and corrective actions specified for problems were adequate. Overall, corrective actions developed and implemented for issues were effective in correcting the problems. However, the team identified examples where reportability issues were not dispositioned in a timely manner, root causes were not adequately identified, and corrective actions were not focused to correct problems.

The team determined that audits and self-assessments were effective in identifying deficiencies and areas for improvement in the CAP, and in most cases, corrective actions were developed to address these issues. Operating experience usage was found to be effective and well integrated into the licensee's processes for performing and managing work, and plant operations. Personnel at the site felt free to raise safety concerns to management and use the CAP to resolve.

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

Last modified : November 26, 2008