

Byron 2

1Q/2009 Plant Inspection Findings

Initiating Events

Significance: **G** Sep 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

ISOLATING CARBON DIOXIDE FIRE SUPPRESSION SYSTEM IN UPPER CABLE SPREADING ROOMS WITHOUT PRIOR NRC APPROVAL

A finding of very low safety significance and an associated Non-Cited Violation (NCV) of Byron Unit 1 Operating License Condition 2.C(6) and Byron Unit 2 Operating License Condition 2.E was identified for the licensee's failure to obtain NRC approval before making changes to the fire protection program. Specifically, the licensee isolated the manual carbon dioxide (CO₂) suppression system to the upper cable spreading rooms (UCSR) without prior NRC approval. The licensee entered this issue in the corrective action program and implemented compensatory action to verify detection system operability.

The finding was determined to be more than minor because the inspectors could not reasonably determine that the isolation would not have ultimately required NRC prior approval. The inspectors determined this finding to be of very low safety significance (Green) based on a Phase 2 SDP evaluation. This finding is related to the cross-cutting area of Human Performance for failure to use conservative assumptions in decision making and to adopt a requirement that demonstrates the proposed action is safe in order to proceed with respect to reviewing the plant design and license basis. (H.1(b))

Inspection Report# : [2008004](#) (*pdf*)

Significance: **G** Sep 30, 2008

Identified By: NRC

Item Type: FIN Finding

INADEQUATE PREVENTIVE MAINTENANCE FOR THE UNIT 2 TRAIN B STATION AIR COMPRESSOR

A finding of very low safety significance was self-revealed when the Unit 2 Train B (2B) station air compressor (SAC) tripped on two separate occasions due to inadequate preventive maintenance. The licensee entered this issue into the corrective action program and replaced the failed components and returned the SAC to service. This finding was determined not to be a violation of NRC requirements.

The finding is greater than minor because, if left uncorrected, the issue would have become a more significant safety concern. The inspectors completed a Phase 2 SDP evaluation using the Byron risk-informed inspection notebook and determined that this issue is of very low safety significance (Green) at 1E-7. The inspectors determined that this finding was related to the cross-cutting component of Human Performance for Resources (H.2.(a)) as the licensee did not minimize preventive maintenance deferrals to ensure that equipment were available and adequate to assure nuclear safety.

Inspection Report# : [2008004](#) (*pdf*)

Significance: **W** Feb 14, 2008

Identified By: NRC

Item Type: VIO Violation

Inadequate Design Margins for Continued Operation of SX Riser Pipes

•White. The team identified a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," associated with the licensee's failure to verify the adequacy of the methodology and design inputs used to support licensee decisions to accept the degraded 0B, 0E and 0H essential service water system riser pipes for continued service.

Specifically, the licensee failed to evaluate for compressive loads (e.g., buckling), use the applicable Code allowable stress, apply Code equations which account for thermal loads, and failed to correctly apply equations for checking the pipe functional capability. Consequently, the licensee failed to establish adequate design margins for continued service of the 0E, 0H and 0B essential service water system riser which resulted in extended plant operation with degraded SX riser pipes.

The cause of this apparent violation was related to the Resources Component (Item H.2(a) of IMC 305) for the cross-cutting area of Human Performance, because the licensee failed to maintain plant safety by maintenance of design margins. Specifically, these degraded riser pipes remained in-service without establishing adequate design margins in the engineering evaluations to justify continued service. The licensee subsequently completed a plant shutdown and replaced the degraded portions of these essential service water system riser pipes.

The finding associated with this apparent violation was greater than minor because the degraded essential service water piping condition resulted in an increase in the likelihood of the loss of the essential service water system due to pipe failures, which directly affected the Initiating Events Cornerstone. It was also associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding associated with this apparent violation was assessed using a Phase 3 analysis in accordance with NRC Inspection Manual Chapter 0609 Appendix M, "Significance Determination Process Using Qualitative Criteria," and is preliminarily determined to have low to moderate safety significance (White). (Section 4OA3.4)

Inspection Report# : [2007009](#) (*pdf*)

Inspection Report# : [2009006](#) (*pdf*)

Mitigating Systems

Significance:  Mar 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO PERFORM AN ADEQUATE RISK ASSESSMENT THAT ACCOUNTED FOR ALL RISK SIGNIFICANT STRUCTURES, SYSTEMS AND COMPONENTS THAT WERE UNAVAILABLE PRIOR TO MAINTENANCE ACTIVITIES.

A finding of very low safety significance and associated NCV of 10 CFR 50.65(a)(4) was identified by the inspectors for the licensee's failure to perform a risk assessment that accounted for the inability of the Unit 1 Essential Service Water suction valve 1SX001A to close before performing maintenance. The finding was more than minor because it was similar to NRC IMC 0612, Appendix E, "Examples of Minor Issues," Example 7e, in that the elevated overall plant risk, when correctly assessed, would have required additional risk management actions. This finding had the potential to become a more significant event if the suction valve was required to mitigate flooding in the auxiliary building.

The finding was determined to be of very low safety significance since the Incremental Core Damage Frequency (ICDP) was calculated to be $9.44E-7$ given that the condition existed for 14 days. The primary cause of this finding was related to the cross-cutting area of Human Performance for Resources (H.2(c)) because Valve 1SX001A was not added to the Paragon risk assessment computer program to allow the user to make effective risk assessments. The licensee entered this issue into their correction action program as IR 889131 and performed a risk assessment for the condition.

Inspection Report# : [2009002](#) (*pdf*)

Significance:  Mar 27, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Maintain/Extend the Qualification Basis for Molded-Case Circuit Breakers (MCCBs) Used in Safety Related Applications Greater than 20 Years.

Green. A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified by the inspectors for the failure to maintain the qualification bases for safety-related equipment. Specifically, the licensee failed to maintain/extend the qualified life of the Westinghouse molded case circuit breakers (MCCBs) after the manufacturer's qualifications ended at 20 years as required by 10 CFR Part 50, Appendix A and B. As a result, the licensee issued a condition report and performed an engineering evaluation, which supported continuing qualification of the MCCBs and an operability evaluation, which found the MCCBs operable.

The inspectors determined that the finding was more than minor because not maintaining qualified components in safety-related systems structures and components (SSCs) could lead to the inability to respond to design basis events. The finding screened as of very low safety significance because the finding was a design or qualification deficiency confirmed not to result in loss of operability or functionality. The inspectors identified a cross-cutting aspect associated with this finding in the area of problem identification and resolution because the licensee did not effectively incorporate pertinent manufacturer's operating experience into maintaining the qualification of the MCCBs. (P.2.(b))

Inspection Report# : [2009007](#) (pdf)

Significance:  Mar 27, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Analysis of Molded-Case Circuit Breaker Test Data.

•Green. A finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," was identified by the inspectors for the failure to identify, and take corrective action to address adverse mold case circuit breaker (MCCBs) test results. Specifically, the licensee failed to recognize an excessive test failure rate, assess the impact on the installed MCCBs, promptly replace all failed MCCBs, and evaluate the past and current operability of the attached loads. As a result, the licensee issued a condition report and an operability evaluation, which found the MCCBs operable.

The inspectors determined that the finding was more than minor because not ensuring the function and operability of all required MCCBs supplying safety-related SSCs could lead to the inability to respond to design basis events. The finding screened as very low safety significance because it would not result in the total loss of a safety function. Specifically, the licensee evaluation showed that there was no loss of breaker coordination. The inspectors identified a cross-cutting aspect associated with this finding in the area of human performance, decision making because the licensee did not use conservative assumptions in decision-making. (H1.b)

Inspection Report# : [2009007](#) (pdf)

Significance:  Dec 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO REMOVE OR EVALUATE LOOSE DEBRIS INSIDE OF CONTAINMENT PRIOR TO APPLICABLE MODE

The inspectors identified a finding of very low safety significance and associated Non-Cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow procedure BAP 1450-1, "Access to Containment." Specifically, the inspectors determined that the licensee failed to remove loose debris items from Unit 2 containment prior to Mode 4 or to perform an engineering evaluation. The issue was entered in the licensee's corrective action program as IR 867171.

The finding was more than minor because, if left uncorrected, the issue could have become a more significant safety concern. The inspectors evaluated the finding using IMC 0609, "SDP," Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Finding," dated January 10, 2008, for the Mitigating Systems Cornerstone. Since this finding was not a design or qualification deficiency, did not result in loss of system or train safety function and was not safety significant due to external events, this issue was screened as very low safety significance. This finding

is related to the Work Control component of the Human Performance cross cutting area for the licensee's failure to coordinate work activities and the need for work groups to coordinate with each other. The personnel who left the material in containment assumed it was acceptable as they had documented the material in a surveillance data sheet and the personnel who reviewed the completed data sheet assumed the material had been or would be removed from containment and none questioned the potential impact upon the recirculation sump screens or coordinated with each other to ensure resolution of the material prior to a Mode change. (H.3 (b))

Inspection Report# : [2008005](#) (pdf)

Significance: SL-IV Oct 10, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Update the Boron Recycle and RHR System Descriptions in the UFSAR

Severity Level IV. The inspectors identified a Severity Level IV Non-Cited Violation (NCV), having very low safety significance of 10 CFR 50.71, "Maintenance of Records, Making of Reports," for the licensee's failure to adequately update the Byron Station Updated Final Safety Analysis Report. Specifically, the description of: (1) the boron recycle system did not identify if the system was designed or capable of handling discharges from the safety injection and residual heat removal relief valves; (2) the residual heat removal system did not identify deviations from the system design standard with respect to the suction pipe relief valve single failure analysis and collection of relief valve discharges outside containment. The licensee entered this issue into the corrective action system.

Because this finding affected the NRC's ability to perform its regulatory function, this issue was evaluated using the traditional enforcement process. The finding was determined to be more than minor because the inspectors could not reasonably determine that a change to correct the Final Safety Analysis Report to reflect actual design would not have ultimately required NRC prior approval. The finding was determined to be of very low safety significance because the design deviations associated with the residual heat removal system and boron recycle system did not impact system operability. The inspectors determined that the finding did not have a cross-cutting aspect.

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

Significance:  Sep 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

MISSED VENTING OF THE SAFETY INJECTION SYSTEM PIPING

A finding of very low safety significance and an associated NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow the Adverse Condition Monitoring Plan for safety injection system check valve leakage. Specifically, the licensee failed to vent the safety injection line every three days as required by the plan. The licensee entered this issue in the corrective action program, immediately performed the required venting and incorporated the work into their daily schedule.

This finding is greater than minor because, if left uncorrected, the issue would have become a more significant safety concern. Since this finding is not a design or qualification deficiency, does not result in loss of system or train safety function and was not safety significance due to external events, this issue is screened as very low safety significance. This finding is related to the Work Control component of the Human Performance cross-cutting area for licensee's operation and engineering group to schedule and coordinate work activities as prescribed by the adverse condition monitoring plan to ensure the safety systems remained operable. (H.3(b))

Inspection Report# : [2008004](#) (pdf)

Significance:  Jun 30, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO CORRECTLY TIGHTEN FITTINGS LEADS TO FAILURE TO START DURING A SURVEILLANCE OF THE 0B SX AMKEUP PUMP

A finding of very low safety significance and associated NCV of Technical Specification (TS) 5.4, "Procedures," was self-revealed on May 27, 2008, when the 0B essential service water (SX) system makeup pump failed to start during a

planned monthly surveillance test. The pump failed to start due to a lack of fuel prime. The licensee determined that on April 29, 2008, the check valve on the fuel oil supply line between the day tank and the engine had been replaced as part of a routine preventive maintenance program. The check valve was found in the installed condition with a loose fitting. The loose fitting had leaked slowly allowing fuel oil to drain from the primed fuel oil supply line. The issue has been entered into the licensee's CAP (IR 779699). The licensee's corrective actions included repairing the check valve and associated deficiencies, as well as revising the maintenance procedure.

The finding was considered more than minor because there was an actual loss of safety function of a single train for greater than its TS allowed outage time. The finding was determined to be of very low safety significance during a Phase 3 SDP. The primary cause of this finding was related to the cross-cutting area of Human Performance for Work Practices (H.4(c)) because licensee supervisory oversight of work activity failed to ensure procedural compliance. (Section 1R12.1.b)

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

Barrier Integrity

Significance:  Oct 10, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Analyze Inlet Piping Loads and Establish an Adequate HUT Quench Volume

Green. The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," having very low safety significance, associated with the licensee's failure to analyze and establish an adequate quench volume within the boron recycle system holdup tanks and failure to analyze the water hammer loads on boron recycle system holdup tank inlet piping induced by relief valve discharges. Insufficient holdup tank quench volume could result in an overpressure failure of the holdup tank and the water hammer induced piping loads could damage the boron recycle system holdup tank inlet piping system. The licensee corrective actions included maintaining a minimum 40 percent boron recycle holdup tank level as a quench volume for system relief valves and initiated an action to perform an analysis to investigate the magnitude of the potential water hammer loads on the inlet piping.

The finding was more than minor because, the finding affects the Barrier Integrity Cornerstone objective for maintaining the Radiological Barrier Function of the Containment. The finding was associated with the design control and procedure quality attributes of the Barrier Integrity Cornerstone. The inspectors determined that the failure to establish an adequate boron recycle system holdup tank quench volume and analyze the magnitude of water hammer loads on boron recycle system holdup tank inlet piping degraded the Radiological Barrier Function of the Containment; but did not represent an actual open pathway from containment, therefore, the finding screened as having very low safety significance (Green). The inspectors determined that the finding did not have a cross-cutting aspect.

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

Emergency Preparedness

Occupational Radiation Safety

Significance:  Dec 31, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

FAILURE TO EVALUATE RADIOLIGICAL HAZARDS FOR AIRBORNE RADIOACTIVITY

The inspectors identified a finding of very low safety significance and associated Non-Cited Violation (NCV) of Technical Specification (TS) 5.4.1 for failure to implement procedures required to evaluate radiological hazards for airborne radioactivity. Specifically, the inspectors identified that the licensee failed to re-start an air sampler on the refuel floor which supplied the only air monitoring while workers were performing activities in the area. The corrective actions taken by the licensee included starting the required air sampler. The issue was entered in the licensee's corrective action program as IR 828767.

The finding is more than minor because it impacted the program and process attribute of the Occupational Radiation Safety Cornerstone and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation, in that the failure to fully evaluate the radiological hazards present in work areas could result in unplanned exposure to workers. The finding was determined to be of very low safety significance because it was not an As-Low-As-Is-Reasonably-Achievable (ALARA) planning issue, there was no overexposure nor potential for overexposure, and the licensee's ability to assess dose was not compromised. This finding was caused by inadequate self checking and peer checking. Consequently, the cause of this deficiency had a cross-cutting aspect in the area of Human Performance. Specifically, the licensee failed to utilize human error prevention techniques commensurate with the risk of the task. H.4(a)

Inspection Report# : [2008005](#) (*pdf*)

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 : May 28, 2009