

Robinson 2

3Q/2016 Plant Inspection Findings

Initiating Events

Significance: G Sep 30, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Assess and Manage Risk for Main Turbine Trip Maintenance Resulting in Turbine/Reactor Trip

A self-revealing Green non-cited violation (NCV) of 10 CFR 50.65(a)(4) was identified for the failure to adequately assess and manage the increase in risk associated with online maintenance activities involving the removal of the cover to the main turbine trip mechanism in order to perform visual inspections. During removal of the cover, the turbine trip mechanism lever was contacted causing an automatic turbine/reactor trip. The licensee took immediate corrective actions to reemphasize the need to enter all applicable types of work activities into the work management process and to conduct formal risk assessments in accordance with the risk management program. The licensee entered this issue into the corrective action program (CAP) as condition report (CR) 2056554.

The licensee's failure to adequately assess and manage the risk of maintenance associated with visual inspection of the turbine trip mechanism was a performance deficiency (PD). The inspectors evaluated the PD in accordance with IMC 0612, Appendix B, "Issue Screening," and determined it to be more than minor because it impacted the human performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Specifically, the failure to assess and manage the risk associated with removing the turbine trip mechanism cover to conduct visual inspections resulted in a turbine/reactor trip. The inspectors evaluated the finding in accordance with IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process." In accordance with Appendix K, the inspectors requested that a regional Senior Reactor Analyst (SRA) independently evaluate the risk. A Region II SRA performed an analysis of the risk deficit for the unevaluated condition associated with the work activity on the turbine trip mechanism. The latest Robinson Standardized Plant Analysis Risk (SPAR) model was used to calculate an incremental core damage probability deficit (ICDPD). The result was an ICDPD of $3.74E-7$ and represented the increase in core damage probability associated with a turbine/reactor trip coincident with the dedicated shutdown diesel generator being out of service at the time of the event. In accordance with IMC 0609, Appendix K, because the calculated ICDPD was not greater than $1E-6$, the finding was screened as having very low safety significance (Green). The cause of the PD was directly related to the cross-cutting aspect of work management in the cross-cutting area of human performance because the licensee failed to adequately implement a process of planning, controlling, and executing work activities such that nuclear safety was the overriding priority. Specifically, the licensee failed to adequately assess, manage, and implement risk management actions for activities associated with trip sensitive equipment. [H.5

Inspection Report# : [2016003](#) (pdf)

Significance: G Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Adequately Establish and Implement Procedure During Tornado Watch/Warning

The inspectors identified a Green non-cited violation (NCV) of technical specification (TS) 5.4.1.a for the licensee's failure to adequately establish and implement procedure OMM-021, Operation During Adverse Weather Conditions.

Specifically, the licensee failed to include requirements to tie down or remove loose material in the area of Unit 1 adjacent to the switchyard. Additionally, the licensee failed to implement the procedural requirements to tie down or remove material in the vicinity of the turbine building ground level and secure doors to the chemical treatment room and as required by OMM-021. As corrective action, the licensee secured or removed the material in the vicinity of the turbine building and issued a procedure change request to change OMM 021 to include an action to secure or remove potential missile hazards in the vicinity of the switchyard in the Unit 1 area. The licensee entered this issue into their corrective action program (CAP) as condition report (CR) 2005141.

The licensee's failure to adequately establish and implement procedure OMM 021, Operation During Adverse Weather Conditions, for preparation for a tornado watch/warning was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the protection against external factors attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure to secure or remove potential missile hazards in the areas adjacent to the switchyard increased the likelihood of a unit trip and/or loss of offsite power event. The inspectors evaluated the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 1, Section B and determined the finding to be of very low safety significance (Green) because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. The performance deficiency had a cross-cutting aspect of Work Management in the area of Human Performance because the organization did not implement a process of planning, controlling, and executing work activities associated with a tornado watch/warning such that nuclear safety is the overriding priority [H.5].

Inspection Report# : [2016001](#) (pdf)

Significance:  Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Follow Procedure for a Light Indication Replacement

The inspectors identified a Green NCV of TS 5.4.1.a, for the licensee's failure to adequately implement procedure OMM-001-11, Logkeeping, while performing maintenance. Specifically, the licensee replaced a local light indication for a containment instrument air isolation valve, which resulted in a plant transient, without a senior reactor operator (SRO) being contacted, as required per procedure. As corrective action, the licensee replaced the blown fuse, issued a standing instruction to initiate a work request for all light bulb replacements, and submitted a procedure revision request to add more detailed guidance for lightbulb replacement. The licensee entered this issue into their CAP as CR 1991686.

The failure to contact an SRO prior to changing out a local light indication for PCV-1716 as required by procedure OMM-001-11 was a performance deficiency. The performance deficiency was more than minor because it was associated with the human performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Specifically, because the SRO was not contacted, an assessment and management of risk associated with the replacement of the light indication was not performed, and resulted in a plant transient. The inspectors evaluated the significance of the finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 1, Section B and determined the finding to be of very low safety significance (Green) because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. The performance deficiency had a cross-cutting aspect of Avoid Complacency in the area of Human Performance because the individual performing the lightbulb replacement did recognize and plan for the possibility of mistakes, latent issues, and inherent risk [H.12].

Inspection Report# : [2016001](#) (pdf)

Mitigating Systems

Significance: G Sep 30, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Scope Tainter Gate Flood Protection Features in Maintenance Rule Resulting in Degraded Performance

A self-revealing Green NCV of 10 CFR 50.65(b)(2)(ii) was identified for the failure to scope the external flood protection function of the Robinson Lake Dam spillway (Tainter) gates in the maintenance rule (MR) monitoring program. The failure to include the Tainter gates in the MR program resulted in ineffective maintenance being performed and subsequent degraded opening capability which challenged the availability of safety-related equipment during design basis rainfall events due to site flooding. The licensee took immediate corrective actions to replace/refurbish the chains to both gates and completed full open testing to restore their functionality. In addition, the licensee has developed and initiated implementation of an action plan to improve and ensure reliability of the gates, and initiated actions to revise the MR scoping program to include the Tainter gates. The issue was entered into the licensee's CAP as CR 2035500.

The failure to scope the flood protection function of the Lake Robinson Dam Tainter gates in the maintenance rule monitoring program was a PD. The finding is more than minor because it is associated with the protection against external factors (i.e., flood hazard) 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. Specifically, failure to monitor flood protection features associated with the Tainter gates resulted in degraded gate opening performance that could have resulted in site flooding during design basis rainfall events and adversely impact multiple trains of safety-related equipment due to water intrusion. Using IMC 0609, Appendix A, "The SDP for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding involved the degradation of equipment specifically designed to mitigate flooding events. In accordance with Exhibit 4, "External Events Screening Questions," the inspectors determined that the finding represented a degradation of two or more trains of a multi-train system or function during an external flooding event, therefore it required a detailed risk evaluation. A regional senior reactor analyst completed a detailed risk evaluation in accordance with NRC IMC 0609 Appendix A, and Appendix M, Significance Determination Process Using Qualitative Criteria, using the latest NRC Robinson Standardized Plant Analysis Risk model. The high uncertainty associated with estimating flood frequencies was the reason for using the NRC IMC Appendix M approach. The major analysis assumptions included a one-year exposure interval, recovery credit for opening the Tainter gates subsequent to binding of the chain, and limited credit for FLEX flooding mitigation strategies. If the rainfall produced a water surface elevation which would overtop the dam, the dam was considered failed and the ultimate heat sink lost. The rainfall frequencies requiring gate operation were estimated using a combination of National Oceanographic and Atmospheric Administration rainfall data and a probabilistic technique to establish precipitation frequency estimates performed by the licensee. The dominant sequence was a flood event inducing a non recoverable loss of offsite power and loss of the emergency buses with a failure of the operators to manually recover the Tainter gates and failure of the operators to depressurize the steam generators to facilitate FLEX injection leading to a loss of core heat removal and core damage. The risk was mitigated by the low flood frequency, and the likely recovery of the Tainter gates prior to site flooding.

There were additional conservatisms which were not applied to the result but would reduce the risk. These included the fact that the plant would be shutdown prior to flooding impacting safety related equipment, which would reduce decay heat cooling required, and additional FLEX flooding strategies which could provide cooling even if the dam was lost. The risk increase due to the performance deficiency was $< 1.0E-6$ /year, a Green finding of very low safety significance. The licensee's analysis and full scope probabilistic risk assessment model produced a similar result. The inspectors determined that since the scoping of plant systems had occurred more than three years in the past, the

finding did not represent current plant performance and therefore did not have a cross-cutting aspect associated with it.

Inspection Report# : [2016003](#) (*pdf*)

Significance:  Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Scope Safety-Related Auxiliary Building Ventilation Fans into the Maintenance Rule

The inspectors identified a Green NCV of 10 CFR 50.65(b)(1), for the licensee's failure to include safety-related structures, systems and components (SSCs) within the scope of the maintenance rule (MR) program. Specifically, the licensee failed to include auxiliary building ventilation fans, which are required to remain functional during and following a design bases event to mitigate the consequences of an accident, within the scope of the maintenance rule monitoring program. The licensee initiated corrective actions to include the auxiliary building ventilation exhaust fans within the MR monitoring program. The licensee entered this issue into their CAP as CR 1997952.

The failure to appropriately scope the safety-related auxiliary building ventilation fans within the maintenance rule is a performance deficiency. This performance deficiency was determined to be more than minor because it was associated with the Mitigating Systems Cornerstone attribute of equipment performance and affected the cornerstone objective of ensuring the availability and reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to include auxiliary building ventilation fans in the maintenance rule affects the licensee's ability to effectively monitor the performance or condition of the SSCs such that SSCs remain capable of fulfilling their intended function. Using IMC 0609, Appendix A, issued June 19, 2012, SDP for Findings At-Power, the inspectors determined that this finding is of very low safety significance (Green) because the finding did not represent an actual loss of function of one or more non-Tech Spec Trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. The finding does not have a cross-cutting aspect since the failure to scope this equipment into the maintenance rule was not recognized during the initial maintenance rule scoping activities in 1997 and, as a result, is not indicative of current licensee performance.

Inspection Report# : [2016001](#) (*pdf*)

Significance:  Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Control Deviations of from Design Specifications for the Service Water System

A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion III, Design Control, was identified for the licensee's failure to assure that appropriate quality standards are specified and included in design documents and that deviations from such standards are controlled. Specifically, the failure to control a modification of the service water (SW) system led to the installation of a non-conforming valve and resulted in the inoperability of the motor-driven auxiliary feedwater (MDAFW) system. As corrective action, the licensee performed a modification to replace the SW-115 valve. The licensee entered this issue into their CAP as CR 1993790.

The failure to control deviations from design specifications for a modification to the SW system was the performance deficiency. The performance deficiency was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely 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). Specifically, the installation of a valve outside of design specifications for the SW system contributed to the failure of SW 115 and reduction of cooling water flow to the MDAFW system. This degraded condition rendered the "A" train of the MDAFW system inoperable for greater than its TS AOT from December 15, 2015, to January 19, 2016. In addition, both trains of MDAFW were inoperable for greater than the TS AOT from

January 19, 2016, to January 22, 2016. The inspectors used NRC IMC 0609, Attachment 4, “Phase 1 - Initial Screening and Characterization of Findings,” to evaluate the significance of this issue and determined the finding required a Detailed Risk Evaluation because the finding represented an actual loss of function of at least a single train of MDAFW for greater than its TS AOT. A detailed risk evaluation was performed by a regional SRA in accordance with NRC IMC 0609 Appendix A using the NRC Robinson SPAR model and input from the licensee’s Robinson Fire PRA model. The major analysis assumptions included exposure periods for loss of a single train of MDAFW for 38 days and loss of both trains of MDAFW for a period of three hours. No recovery was assumed. The SDAFW and “C” AFW trains were not affected. The dominant sequence was a loss of main feedwater initiator followed by failures of both trains of MDAFW due to the performance deficiency, the SDAFW pump, the “C” train of AFW, and failure of the operator to implement feed and bleed cooling. The risk associated with this performance deficiency was mitigated by the availability of alternate AFW trains. The detailed risk evaluation determined that the increase in core damage frequency due to the performance deficiency was less than 1.0 E-6 per year and therefore the performance deficiency was characterized as a GREEN finding of very low safety significance. The finding does not have a cross-cutting aspect since the installation of a valve outside of design specifications into the SW system occurred prior to 1978 and, as a result, is not indicative of current licensee performance.

Inspection Report# : [2016001](#) (*pdf*)

Significance:  Mar 31, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Adequately Maintain Emergency Operating Procedures EOP-ECA-0.0 and EOP-E-0

The NRC identified a Green NCV of TS 5.4.1.a for the licensee’s failure to adequately maintain procedures EOP ECA-0.0, Loss of All AC Power, and EOP-E-0, Reactor Trip or Safety Injection, as recommended in RG 1.33, Revision 2, Appendix A, February 1978. Revision four of EOP-ECA-0.0, contained a step that could delay or prevent the restoration of a charging pump when electrical power was available to do so. This could have led to a loss of reactor coolant system (RCS) pressure control. Revision six of EOP-E-0, contained a step that could have led to the restoration of seal injection to overheated reactor coolant pump (RCP) seals with subsequent RCP seal damage and RCS leakage. The licensee submitted procedure revision requests (PRRs) 2009136 and 2009217 to correct the procedures. The licensee entered this issue into their CAP as CR 2009602.

The licensee’s failure to adequately maintain EOP-ECA-0.0 and EOP-E-0 in accordance with OMM-43, “Verification and Validation,” was determined to be a performance deficiency. The performance deficiency was determined to be more than minor because, if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, steps in EOP-ECA-0.0 and EOP-E-0 could lead to one or more of the following during an event: unnecessary reduction in core sub-cooling margin, loss of RCS pressure control, and RCP seal damage leading to increased RCS leakage. The finding is associated with the procedure quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring availability, reliability, and capability of systems needed to respond to initiating events to prevent undesired consequences. Using the mitigating systems screening questions located in Exhibit 2 of Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green). The finding has a cross-cutting aspect in the area of human performance associated with avoiding complacency because individuals did not recognize and plan for the possibility of mistakes and latent issues when performing EOP verification and validation [H.12].

Inspection Report# : [2016001](#) (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

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