



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II**

245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

November 4, 2016

Richard Michael Glover  
Site Vice President  
H. B. Robinson Steam Electric Plant  
Duke Energy  
3581 West Entrance Road, RNPA01  
Hartsville, SC 29550

**SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT – NRC INTEGRATED INSPECTION  
REPORT 05000261/2016003**

Dear Mr. Glover:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your H. B. Robinson Steam Electric Plant, Unit 2. On October 13, 2016, the NRC inspectors discussed the results of this inspection with you and members of your staff. Additionally, on October 26, 2016, a re-exit meeting was conducted with Mr. J. Krakuszeski, and other members of your staff to discuss the final results of the inspection. The results of this inspection are documented in the enclosed inspection report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II, the Director, Office of Enforcement; and the NRC resident inspector at H. B. Robinson Steam Electric Plant, Unit 2.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at the H. B. Robinson Steam Electric Plant, Unit 2.

R. Glover

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This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

**/RA/**

Steven D. Rose, Branch Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Docket No.: 05000261

License No.: DPR-23

Enclosure:

Inspection Report 05000261/2016003

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Letter to Richard Michael Glover from Steven D. Rose dated November 4, 2016

SUBJECT: H.B. ROBINSON STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION  
REPORT 05000261/2016003

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-261

License Nos.: DPR-23

Report No.: 05000261/2016003

Licensee: Duke Energy Progress, Inc.

Facility: H. B. Robinson Steam Electric Plant, Unit 2

Location: 3581 West Entrance Road  
Hartsville, SC 29550

Dates: July 1, 2016 through September 30, 2016

Inspectors: J. Zeiler, Acting Senior Resident Inspector  
C. Dykes, Health Physics Inspector  
R. Kellner, Senior Health Physicist (Section 2RS8)  
W. Loo, Senior Health Physicist (Section 2RS1)  
W. Pursley, Acting Resident Inspector  
J. Reece, Senior Resident Inspector, V. C. Summer

Approved by: Steven D. Rose, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Enclosure

## SUMMARY

Integrated Inspection Report 05000261/2016003, July 1, 2016, through September 30, 2016; Duke Energy Progress, Inc., H. B. Robinson Steam Electric Plant, Unit 2, Maintenance Effectiveness, Maintenance Risk Assessments and Emergent Work Control.

The report covered a three-month period of inspection by resident inspectors and regional inspectors. There were two self-revealing violations documented in this report. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. The cross-cutting aspects are determined using IMC 0310, "Aspects within the Cross-Cutting Areas, dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated August 1, 2016. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

### Cornerstone: Initiating Events

- Green. 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  $3.74\text{E-}7$  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  $1\text{E-}6$ , 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] (Section 1R13)

#### Cornerstone: Mitigating Systems

- Green. 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  $< 1.0\text{E-}6/\text{year}$ , 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. (Section 1R12)



## REPORT DETAILS

### Summary of Plant Status

The unit began the inspection period at 100 percent rated thermal power (RTP). On August 24, 2016, an automatic reactor trip occurred due to an inadvertent turbine trip actuation. That same day, the unit was shut down to Mode 4 for a planned maintenance outage to replace five low pressure turbine blades. The unit was returned to 100 percent RTP on September 6, 2016, and remained at essentially full power for the remainder of the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

##### 1R01 Adverse Weather Protection (71111.01 – 2 samples)

###### a. Inspection Scope

###### .1 Impending Adverse Weather Conditions

The inspectors reviewed the licensee's preparations to protect risk-significant systems from Hurricane Hermine expected on September 3, 2016. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures, including operator staffing, before the onset of and during the adverse weather conditions. The inspectors reviewed the licensee's plans to address the ramifications of potentially lasting effects that may result from the adverse weather conditions. The inspectors verified that operator actions specified in the licensee's adverse weather procedure maintain readiness of essential systems. The inspectors verified that required surveillances were current, or were scheduled and completed, if practical, before the onset of anticipated adverse weather conditions. The inspectors also verified that the licensee implemented periodic equipment walkdowns or other measures to ensure that the condition of plant equipment met operability requirements. Documents reviewed are listed in the Attachment.

###### .2 Readiness to Cope with External Flooding

The inspectors evaluated the licensee's implementation of flood protection procedures and compensatory measures during impending conditions of flooding or heavy rains. The inspectors reviewed the updated final safety analysis report (UFSAR) and related flood analysis documents to identify those areas containing safety related equipment that could be affected by external flooding and their design flood levels. The inspectors reviewed procedures for coping with external flooding and reviewed corrective actions for past flooding events. The inspectors verified that the procedures for coping with flooding could reasonably be achieved. For those areas where operator actions are credited, the inspectors assessed whether the flooding event could limit or preclude the required actions. In addition, the inspectors conducted a walkdown of the site boundary and Robinson Dam and spillway (Tainter) gates to assess whether there had been any changes in the site topography that could impact external flood assumptions and to assess the adequacy of flood protection equipment relied upon to mitigate the effects of external flooding. Documents reviewed are listed in the Attachment.

b. Findings

Enforcement aspects related to the Tainter gates are discussed in Section 1R12 of this report.

1R04 Equipment Alignment (71111.04 – 3 samples)

a. Inspection Scope

.1 Partial Walkdown

The inspectors verified that critical portions of the selected systems were correctly aligned by performing partial walkdowns. The inspectors selected systems for assessment because they were a redundant or backup system or train, were important for mitigating risk for the current plant conditions, had been recently realigned, or were a single-train system. The inspectors determined the correct system lineup by reviewing plant procedures and drawings. Documents reviewed are listed in the Attachment.

The inspectors selected the following systems or trains to inspect:

- Service water (SW) pumps 'A', 'C', and 'D' while the 'B' SW pump was out of service for emergent pump replacement
- Motor-driven auxiliary feedwater (MDAFW) pumps 'B' and 'C' and steam-driven auxiliary feedwater pump (SDAFW) while MDAFW pump 'A' was out of service for scheduled maintenance

.2 Complete Walkdown

The inspectors verified the alignment of the containment spray system. The inspectors selected this system for assessment because it is a risk-significant mitigating system. The inspectors determined the correct system lineup by reviewing plant procedures, drawings, the UFSAR, and other documents. The inspectors reviewed records related to the system's outstanding design issues, maintenance work requests, and deficiencies. The inspectors verified that the selected system was correctly aligned by performing a complete walkdown of accessible components.

To verify the licensee was identifying and resolving equipment alignment discrepancies, the inspectors reviewed corrective action documents, including condition reports and outstanding work orders. The inspectors also reviewed periodic reports containing information on the status of risk-significant systems, including maintenance rule reports and system health reports. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 5 samples)

a. Inspection Scope

Quarterly Inspection

The inspectors evaluated the adequacy of selected fire plans by comparing the fire plans to the defined hazards and defense-in-depth features specified in the fire protection program. In evaluating the fire plans, the inspectors assessed the following items:

- control of transient combustibles and ignition sources
- fire detection systems
- water-based fire suppression systems
- gaseous fire suppression systems
- manual firefighting equipment and capability
- passive fire protection features
- compensatory measures and fire watches
- issues related to fire protection contained in the licensee's corrective action program

The inspectors toured the following fire areas to assess material condition and operational status of fire protection equipment. Documents reviewed are listed in the Attachment.

- Service water pump/intake area, fire zone 29
- Boron injection tank room, fire zone 8
- Turbine building mezzanine level, fire zone 25
- Emergency 4160V switchgear room, fire zone 20
- MDAFW pump room, fire zone 6

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 2 samples)

a. Inspection Scope

Internal Flooding

The inspectors reviewed related flood analysis documents and walked down the areas listed below containing risk-significant structures, systems, and components susceptible to flooding. The inspectors verified that plant design features and plant procedures for flood mitigation were consistent with design requirements and internal flooding analysis assumptions. The inspectors also assessed the condition of flood protection barriers and drain systems. In addition, the inspectors verified the licensee was identifying and properly addressing issues using the corrective action program. Documents reviewed are listed in the Attachment.

- Safety Injection and Containment Spray Room (internal flood zone FLC030)
- Charging Pump Room (internal flood zone FLC040A)

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07 – 1 sample)

a. Inspection Scope

Annual Review

The inspectors verified the readiness and availability of the emergency diesel generator (EDG) 'A' and 'B' jacket water, lube oil, and aftercooler heat exchangers to perform their design functions by reviewing performance test reports, verifying the licensee uses the periodic maintenance method outlined in NRC Generic Letter 89-13, reviewed the licensee's implementation of biofouling controls, verifying critical operating parameters by reviewing operating data, verifying correct categorization and receipt of maintenance under the Maintenance Rule and discussing EDG heat exchanger performance with responsible plant staff. Additionally, the inspectors verified that the licensee had entered any significant heat exchanger performance problems into the corrective action program and that the licensee's corrective actions were appropriate. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (71111.11 – 2 samples)

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification

On September 14, 2016, the inspectors observed an evaluated simulator scenario administered to an operating crew conducted in accordance with the licensee's accredited regualification training program. The scenario involved a dropped control rod, small reactor coolant system leak, followed by a large break loss of coolant accident.

The inspectors assessed the following:

- licensed operator performance
- the ability of the licensee to administer the scenario and evaluate the operators
- the quality of the post-scenario critique
- simulator performance

Documents reviewed are listed in the Attachment.

.2 Resident Inspector Quarterly Review of Licensed Operator Performance in the Actual Plant/Main Control Room

The inspectors observed licensed operator performance in the main control room during the following evolutions that involved heightened plant activities or risk:

- Scheduled downpower to 99 percent RTP to conduct auxiliary feedwater pump testing on August 9, 2016
- Plant response to and stabilization following a reactor trip on August 24, 2016
- Reactor restart from a turbine blade replacement outage on September 5, 2016

The inspectors assessed the following:

- use of plant procedures
- control board manipulations
- communications between crew members
- use and interpretation of instruments, indications, and alarms
- use of human error prevention techniques
- documentation of activities
- management and supervision

Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 3 samples)

a. Inspection Scope

The inspectors assessed the licensee's treatment of the issues listed below to verify the licensee appropriately addressed equipment problems within the scope of the maintenance rule (10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"). The inspectors reviewed procedures and records to evaluate the licensee's identification, assessment, and characterization of the problems as well as their corrective actions for returning the equipment to a satisfactory condition. Documents reviewed are listed in the Attachment.

- CR 2043826, Failure of Tainter Gates to fully open during testing
- CR 0663140, AFW pump 'C' return to Maintenance Rule (a)(2) status
- CR 1944560, Maintenance Rule 10 CFR 50.65(a)(3) periodic evaluation

b. Findings

Introduction: A self-revealing Green NCV of 10 CFR 50.65(b)(2)(ii) was identified for the licensee's failure to scope the external flood protection function of the Robinson Lake Dam spillway (Tainter) gates in the MR monitoring program. The failure to include the Tainter gates in the MR 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.

Description: The flood protection section of the Robinson UFSAR states that site flooding is a physical impossibility and credits the Lake Robinson Dam appurtenant structures (i.e., Spillway and two Tainter gates) as the means by which flooding is prevented. As such, there are no water tight doors on the first floor of any buildings including the auxiliary building where numerous safety-related equipment is located such as EDGs, auxiliary feedwater pumps, component cooling water pumps, and the emergency core cooling system pumps. The UFSAR design basis rainfall event is

based on 21.4 inches of rain in a 48-hour period. The peak flood flow into the Robinson Lake from this rainfall event yields 39,000 cubic feet/second (cfs). The two installed Tainter gates are operated locally and from the Unit 1 (Fossil Plant) control room and both must fully open (30 feet each) to release the required 39,000 cfs to prevent Lake Robinson lake levels from rising above the top of the dam (elevation 230 feet) and inundating the site, which is at grade elevation of 226 feet. Damage to equipment in the auxiliary building due to flooding occurs at a depth of 226 feet and 5 inches (specifically, the EDGs and the E1 and E2 safety-related electrical switchgear).

On June 6, 2016, full open testing was conducted on the 'B' Tainter gate in accordance with the licensee's License Renewal Aging Management commitments. After opening 3 feet, the lift gate chain experienced excessive binding and testing was halted due to concerns that the binding could result in damage to the chain, structural steel components, or motor. The chain links and pins were subsequently refurbished and/or replaced as necessary and on June 28, 2016, a successful full open test was completed. Subsequently, on July 7, 2016, full open testing was attempted on the 'A' Tainter gate. Similar excessive lift gate chain binding was experienced and the gate was only able to open 9 feet. Similarly, the gate chain link and pins were refurbished and/or replaced and on July 19, 2016, the 'A' Tainter gate was restored to functionality following completion of a successful full open test.

The licensee's investigation into the gate failures determined that in 2007 and 2008, during the previous refurbishments of the 'A' and 'B' Tainter gates by an outside contractor, the chains had not been lubricated causing the chain components to severely corrode, resulting in the binding. During these previous refurbishments, the contractor had questioned the lack of lubrication specifications, as well as the lack of lubrication fittings that are typically utilized on large radial gate chains. The licensee decided that lubrication fittings would need a plant modification to be installed and directed the contractor not to install the fittings and not to apply any lubricant. This was apparently due to environmental concerns with the use of a lubricant and lack of knowledge by the licensee that an original vendor manual existed for the gates that specified the use of a specific lubricant. A subsequent missed opportunity occurred during the post-maintenance testing for this 2007 and 2008 refurbishment activity, which involved full open gate testing. During this testing, it was noted that while no actual binding occurred, the lift chain operation was not as smooth as it should have been. No subsequent action was taken and this observation was not entered into the licensee's corrective action program. The licensee attributed the root cause of the event to engineering, operations, and management failure to recognize the nuclear safety risks associated with the spillway/dam and associated components as it relates to flooding. In addition to the specific 2007/2008 refurbishment issues, numerous past maintenance weaknesses and instances of poor oversight were identified indicating the equipment was not being maintained commensurate with its safety significance. Some of the more significant of these items included the following:

- From 1960-2006, operation and maintenance of the Tainter gates were under full control of Unit 1 (Fossil Plant). As a result, there was limited documentation of Tainter gate inspections, operations, and maintenance. Licensee interviews with previous Unit 1 staff revealed that the dam and spillway was inspected on a monthly basis by Unit 1 chemistry personnel and that the gates were raised approximately one inch every month to confirm functionality. None of the personnel recalled whether the gates were ever tested to confirm full opening capability.

- Prior to the previously mentioned 2007 and 2008 Tainter gate refurbishments, both gates were inspected. The 'B' gate was opened to 28 feet without maintenance assistance; however, severe corrosion was identified necessitating complete chain replacement as part of the refurbishment. Similarly, prior to the 2008 'A' gate refurbishment, visual inspections noted severe corrosion such that the pre-maintenance test to open the gate was not performed due to concerns with the material condition of the chains.
- In 2010, a 5-year independent engineering consultant firm inspection of the dam and associated impoundment structures/equipment was completed; however, it did not include inspection of the Tainter gates as intended based on the refurbishments that were performed in 2007-2008.
- In 2011, the 5-year License Renewal Aging Management full opening functional test was not performed based on having refurbished the gates in 2007-2008.

As part of the review of this issue, the inspectors reviewed the licensee's MR program documents. The Tainter gates are designated as nonsafety-related equipment and is part of the Reservoir System. In 1997, when the MR program was initially implemented, the only part of the Reservoir System that was scoped in the MR was the dam physical structure. The Tainter gates and related operational equipment involved in gate opening and closing, were not scoped in the MR program. The inspectors determined that the Tainter gates were required to be scoped in the MR program because failure of the gates could prevent multiple safety-related systems from fulfilling their safety-related functions during design basis rainfall events.

Analysis: 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 result in site flooding during design basis rainfall events and adversely impact the functionality of 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  $< 1.0\text{E-}6/\text{year}$ , 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 3 years in the past, the finding did not represent current plant performance and therefore did not have a cross-cutting aspect associated with it.

Enforcement: 10 CFR 50.65(b)(2)(ii) requires, in part, that the scope of the monitoring program specified in 10 CFR 50.65(a)(1) include nonsafety-related structures, systems, or components whose failure could prevent safety-related structures, systems, and components from fulfilling their safety-related function. Contrary to the above, from initial maintenance rule scoping in 1997 to the present, the flood protection features associated with the Tainter gates were not included in the scope of the monitoring program specified in 10 CFR 50.65(a)(1). Specifically, failure of the nonsafety-related Tainter gates could prevent multiple safety-related systems from fulfilling their safety-related functions during design basis rainfall events. 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/ensure reliability of the gates and initiated actions to revise the maintenance rule scoping program to include the Tainter gates and its associated function of providing flood protection to safety-related equipment. Because this violation was determined to be of very low safety significance (Green) and has been entered into the licensee's corrective action program as CR 2035500, this violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000261/2016003-01, Failure to Scope Tainter Gate Flood Protection Features in Maintenance Rule Resulting in Degraded Performance)

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 samples)

a. Inspection Scope

The inspectors reviewed the maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk management actions. The inspectors also verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the corrective action program. Additionally, for maintenance resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities. Documents reviewed are listed in the Attachment.



- August 2, 2016, emergent work control of SW pump 'B' replacement following test failure
- August 9, 2016, scheduled valve maintenance on MDAFW pump 'A'
- August 24, 2016, work control associated with removing main turbine trip housing cover to observe trip mechanism
- August 26, 2016, qualitative Yellow risk for decay heat removal safety functional area in Mode 4 for inoperability of turbine building SW isolation valve

b. Findings

Introduction: A self-revealing Green 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.

Description: On August 19, 2016, during quarterly testing of the main turbine trips from the turbine front standard, the trip mechanism became stuck in the trip position. With the turbine trip system maintained in the test configuration, which prevents an actual turbine trip signal from being actuated, the housing cover over the trip mechanism was removed and the trip reset device was manually repositioned allowing the trip signal to be reset. Testing was completed successfully without further incident and the turbine trip system was restored from the test configuration to normal. The licensee determined this problem only affected the testing configuration and not the capability of the turbine trip system from performing its intended function.

On August 24, 2016, the turbine and generator system engineers reviewed the problem experienced during the August 19 test and requested operations to allow the turbine trip mechanism to be visually inspected to gather more information on the problem. Since the licensee perceived this to be a "hands-off" activity, a work order for troubleshooting or for emergent work activity was not initiated as expected by the licensee's work management process. While the licensee recognized that the housing cover had to be removed in order to conduct the visual inspection, the cover removal was considered low risk since it was believed that it had been removed online in the past without causing any issues. This assumption was later found to be incorrect. There was actually no recent maintenance history that the cover had ever been removed without the turbine system being placed in the test configuration or without the turbine offline, either of which, would not pose a turbine or reactor trip risk potential. The operations shift manager and work control senior reactor operator authorized the visual inspection without conducting a formal risk evaluation for the activity which would have evaluated whether this assumption was valid. Subsequently, as the cover to the trip mechanism was removed to conduct the visual inspections, due to the close proximity of the inside cover to the mechanical trip lever, the lever was contacted resulting in an actual turbine trip followed by an automatic reactor trip.

The inspectors reviewed the licensee's requirements for conducting online risk assessments of maintenance activities as prescribed in administrative procedures AD-WC-ALL-0410, "Work Activity Integrated Risk Management" and AD-NF-ALL-0501, "Electronic Risk Assessment Tool (ERAT)." In accordance with AD-WC-ALL-0410, all

proposed online work activities, other than activities that are administrative or have no impact on plant equipment, are required to have a risk impact assessment performed prior to performance. For any work activities associated with the turbine control (trip) system, Attachment 7, "RNP Risk Determination Screening and Matrix," requires a determination of "whether the activity could cause an immediate, severe transient on the unit, and whether the transient could be caused by the activity itself or by accidental interactions with adjacent equipment (i.e., bumps or slips)." The inspectors determined that had this evaluation been performed, personnel would have acknowledged that the potential existed to cause a turbine/reactor trip while removing the cover. As such, the activity would have been designated as a "High" reactor trip initiating event risk activity in accordance with procedure AD-NF-ALL-0501. For a "High" reactor trip risk condition, the procedure required a times 10 multiplier be applied to the Equipment Out of Service online computer based software that provides a quantitative risk assessment for the configuration. In addition, Attachment 7 of AD-WC-ALL-0410, required the execution of risk management actions (RMAs) which included as a minimum, risk coding the activity to reflect its inherent trip sensitive nature, conducting written pre-job briefings, providing increased supervisory oversight, and consideration for conducting the activity under a Complex Plan. The inspectors determined that personnel failed to follow the risk assessment requirements of AD-WC-ALL-0410 and AD-NF-ALL-0501 resulting in underestimating the risk impact and not implementing important RMAs that may have prevented the incident from occurring.

Analysis: The licensee's failure to adequately assess and manage the risk of maintenance associated with visual inspection of the turbine trip mechanism was a PD. The finding is 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 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 SPAR model was used to calculate an ICDPD. The result was an ICDPD of  $3.74\text{E-}7$  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  $1\text{E-}6$ , 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 mitigation actions for activities associated with trip sensitive equipment. [H.5]

Enforcement: 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," requires, in part, that before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the activity. Contrary to above, on August 24, 2016, the licensee failed to assess and manage the risk associated with removing the cover to the main turbine trip mechanism in order to conduct visual inspections. Specifically, proper assessment and management of the risk would have resulted in a higher risk characterization for the work and required additional risk management actions. As a result of implementing the activity without the appropriate assessment of risk and risk management controls, personnel failed to recognize the increased risk associated with performing the activity resulting in a 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. Because this violation was determined to be of very low safety significance (Green) and has been entered into the licensee's corrective action program as CR 2056554, this violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000261/2016003-02, Failure to Assess and Manage Risk for Main Turbine Trip Maintenance Resulting in Turbine/Reactor Trip)

1R15 Operability Determinations and Functionality Assessments (71111.15 – 4 samples)

a. Inspection Scope

Operability and Functionality Review

The inspectors selected the operability determinations or functionality evaluations listed below for review based on the risk-significance of the associated components and systems. The inspectors reviewed the technical adequacy of the determinations to ensure that technical specification (TS) operability was properly justified and the components or systems remained capable of performing their design functions. To verify whether components or systems were operable, the inspectors compared the operability and design criteria in the appropriate sections of the TS and updated final safety analysis report to the licensee's evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment.

- CR 2035500, Lake Robinson dam spillway (Tainter) gate failure to fully open
- CR 2050325, SW pump 'B' failed to meet inservice pump test acceptance criterion
- CR 2051648, TSC/EOF/Security diesel generator failed to transfer to normal switchgear bus during testing
- CR 2058962, Reactor coolant system 250 degree Fahrenheit limit inadvertently exceeded following start of reactor coolant pump 'A'

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)a. Inspection Scope

The inspectors verified that the plant modification listed below did not affect the safety functions of important safety systems. The inspectors confirmed the modification did not degrade the design bases, licensing bases, and performance capability of risk significant structures, systems and components. The inspectors also verified modification performed during plant configurations involving increased risk did not place the plant in an unsafe condition. Additionally, the inspectors evaluated whether system operability and availability, configuration control, post-installation test activities, and changes to documents, such as drawings, procedures, and operator training materials, complied with licensee standards and NRC requirements. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with modifications. Documents reviewed are listed in the Attachment.

- Engineering Change (EC) 405240, Establish new reference values and test criterion for SW pump 'B' following replacement

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)a. Inspection Scope

The inspectors either observed post-maintenance testing or reviewed the test results for the maintenance activities listed below to verify the work performed was completed correctly and the test activities were adequate to verify system operability and functional capability.

- WO 20055749, OP-903, SW pump 'B' post maintenance test
- WO 20099460, OST-924-2, Radiation monitor R-20 post maintenance test following circuitry card replacement
- WO 20101068, OST-302-1, SW pump 'B' inservice testing following pump replacement
- WO 20021225, OST-201-1, MDAFW pump 'A' testing following valve maintenance
- WO 20107123, OST-21-1, Residual Heat Removal (RHR) pump 'A' testing following mechanical seal replacement
- WO 20017710, OST-202, SDAFW pump testing following flow control valve calibration
- WO 13461864, OP-503, Turbine electro-hydraulic control (EHC) pump 'A' post-maintenance testing following replacement of EHC oil filter flow indicator FI-4428

The inspectors evaluated these activities for the following:

- Acceptance criteria were clear and demonstrated operational readiness
- Effects of testing on the plant were adequately addressed
- Test instrumentation was appropriate
- Tests were performed in accordance with approved procedures
- Equipment was returned to its operational status following testing
- Test documentation was properly evaluated

Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with post-maintenance testing. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

For the Unit 2 maintenance outage to replace low pressure turbine blades, from August 24, 2016, through September 5, 2016, the inspectors evaluated the following outage activities:

- outage planning
- shutdown, cooldown, heatup, and startup
- reactor coolant system instrumentation and electrical power configuration
- reactivity and inventory control
- decay heat removal and spent fuel pool cooling system operation

The inspectors verified that the licensee:

- considered risk in developing the outage schedule
- controlled plant configuration in accordance with administrative risk reduction methodologies
- developed work schedules to manage fatigue
- developed mitigation strategies for loss of key safety functions
- adhered to operating license and TS requirements

Inspectors verified that safety-related and risk-significant structures, systems, and components not accessible during power operations were maintained in an operable condition. The inspectors also reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with outage activities. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 3 samples)a. Inspection Scope

The inspectors reviewed the surveillance tests listed below and either observed the test or reviewed test results to verify testing activities adequately demonstrated that the affected SSCs remained capable of performing the intended safety functions (under conditions as close as practical to design bases conditions or as required by TSs) and maintained their operational readiness.

The inspectors evaluated the test activities to assess for preconditioning of equipment, procedure adherence, and equipment alignment following completion of the surveillance. Additionally, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with surveillance testing. Documents reviewed are listed in the Attachment.

Routine Surveillance Tests

- CP-RPI-207, Sampling in the Primary Sample Room, Rev. 2 (Attachment 8, Letdown System Demineralizers)
- OST-001, Nuclear Instrumentation Source Range, Intermediate Range, & Power Range, Rev. 84

In-Service Tests (IST)

- OST-251-2, RHR Pump B and Components Test, Rev. 30

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 - 1 sample)a. Inspection Scope

The inspectors observed a licensed operator evaluated simulator scenario on September 14, 2016, to evaluate implementation of the emergency plan, including event classifications and notifications. The inspectors evaluated the licensee's performance against criteria established in the licensee's procedures. Additionally, the inspectors reviewed the post-exercise critique to assess the licensee's effectiveness in identifying emergency preparedness weaknesses and verified the identified weaknesses were entered in the corrective action program. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

### 2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 – 7 Samples)

#### a. Inspection Scope

##### Hazard Assessment and Instructions to Workers

During facility tours, the inspectors directly observed radiological postings and container labeling for areas established within the radiologically controlled area (RCA) of the auxiliary building and radioactive waste (radwaste) processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas. The inspectors reviewed survey records for several plant areas including surveys for airborne radioactivity, gamma surveys with a range of dose rate gradients, surveys for alpha-emitters and other hard-to-detect radionuclides, and pre-job surveys for upcoming tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. The inspectors attended pre-job briefings and reviewed radiation work permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers.

##### Control of Radioactive Material

The inspectors observed surveys of material and personnel being released from the RCA using small article monitor, personnel contamination monitor, and portal monitor instruments. The inspectors discussed equipment sensitivity, alarm setpoints, and release program guidance with licensee staff. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with licensee staff.

##### Hazard Control

The inspectors evaluated access controls and barrier effectiveness for selected High Radiation Area (HRA), Locked High Radiation Area (LHRA), and Very High Radiation Area (VHRA) locations and discussed changes to procedural guidance for LHRA and VHRA controls with radiation protection (RP) supervisors. The inspectors reviewed implementation of controls for the storage of irradiated material within the spent fuel pool. Established radiological controls, including airborne controls and electronic dosimeter alarm setpoints, were evaluated for selected activities associated with a resin sluice of a pipe located in the drumming room of the auxiliary building that traversed into the bunker area of the radwaste building involving HRA and LHRA conditions. In addition, the inspectors reviewed licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations. The inspectors also reviewed the use of personnel dosimetry including extremity dosimetry and multibadging in high dose rate gradients.

##### Radiation Worker Performance and RP Technician Proficiency

Occupational workers' adherence to selected RWPs and RP technician proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. Jobs observed included activities associated with a resin sluice of a pipe located in the drumming room of the auxiliary building that traversed into the bunker area of the radwaste building involving HRA and LHRA conditions. The inspectors also

evaluated worker responses to dose and dose rate alarms during selected work activities.

#### Problem Identification and Resolution

The inspectors reviewed and assessed condition reports associated with radiological hazard assessment and control. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with licensee procedures. The inspectors also reviewed recent self-assessment results.

Radiation protection activities were evaluated against the requirements of UFSAR Section 12, TS Sections 5.4 and 5.7, 10 CFR Parts 19 and 20, and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, "Control of Radioactively Contaminated Material". Documents reviewed are listed in the Attachment.

#### b. Findings

No findings were identified.

### 2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06 - 2 Samples)

#### a. Inspection Scope

##### Effluent Sampling and Discharge

The inspectors reviewed calibration and functional test records and evaluated traceability of radioactive calibration sources to National Institute of Standards and Technology (NIST) standards for effluent monitors on the Plant Vent (R-14, R-14D and R-14E), Waste Disposal System Liquid Effluent Monitor (R-18), Condensate Polisher Waste Discharge Monitor (R-37) and Steam Generator Blowdown Monitors (R-19A, B, and C). The inspectors also evaluated the licensee's capability to collect high-range post-accident effluent samples from the plant vent.

##### Inspection Criteria

Radwaste system operation and maintenance were evaluated against requirements and guidance documented in the following: ODCM; UFSAR Section 11; Regulatory Guide 1.21, Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants, and TS Sections 3.4 and 5.5. Documents reviewed are listed in the Attachment.

#### b. Findings

No findings were identified.



2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08 – 6 Samples)

a. Inspection Scope

Radioactive Material Storage

The inspectors walked down indoor and outdoor areas inside the protected area as well as the reactor coolant pump motor storage building which is located outside the protected area. During the walk-downs, the inspectors observed the physical condition and labeling of storage containers and the radiological postings for satellite radioactive material storage areas. The inspectors also reviewed the licensee's radwaste procedures for routine surveys and waste storage.

Radioactive Waste System Walkdown, Characterization and Classification

The inspectors walked down accessible sections of the liquid and solid radwaste systems to assess material condition and conformance of equipment with system design diagrams. This included portions of the radwaste building, auxiliary building, outage storage building, and outside areas located within the RCA. The inspectors discussed the function of radwaste components with radwaste system operators. The inspectors discussed possible changes to the radwaste processing systems with radwaste staff. The processes for the dewatering of resins, spent resin tank recirculation, resin sampling, and transfer of resins from the spent resin storage tank to shipping casks and temporary storage casks were reviewed and discussed with radwaste staff.

The inspectors reviewed the 2014 and 2015 Radioactive Effluent Release Report and the 2013-2015 radionuclide characterization and classification for the DAW, RCS Filter, Spent Resin Storage Tank, Spent Fuel Pool Filter, and WWDS Filter waste streams. The inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. The inspectors also evaluated how changes to plant operational parameters were taken into account in waste characterization.

Shipment Preparation and Records

The inspectors observed the preparation and shipment activities for shipment of a reactor coolant pump motor (exempt quantity shipment). The inspectors reviewed eight shipping records for consistency with licensee procedures and compliance with NRC and Department of Transportation (DOT) regulations. This included review of emergency response information, waste classification, radiation survey results, information on the waste manifest, and the authorization of the receiving licensee to receive shipments. Training records for selected individuals currently qualified to ship radioactive material were reviewed for compliance with 49 CFR Part 172 Subpart H.

Identification and Resolution of Problems

The inspectors reviewed CAP documents in the areas of radwaste/shipping. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results. Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20.

Radwaste processing activities and equipment configuration were reviewed for compliance with the licensee's Process Control Program. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification (1983). Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71 (which requires licensees to comply with DOT regulations in 49 CFR Parts 107, 171-180, and 390-397), as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 4 samples)

a. Inspection Scope

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for the Unit 2 PIs listed below. The inspectors reviewed plant records compiled between April 1, 2015, and March 31, 2016, to verify the accuracy and completeness of the data reported for the station. The inspectors verified that the PI data complied with guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedures. The inspectors verified the accuracy of reported data that were used to calculate the value of each PI. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with PI data. Documents reviewed are listed in the Attachment.

Cornerstone: Initiating Events

- unplanned scrams per 7000 critical hours
- unplanned scrams with complications

Cornerstone: Mitigating Systems

- heat removal system

Cornerstone: Barrier Integrity

- reactor coolant system specific activity

b. Findings

No findings were identified.

#### 4OA2 Problem Identification and Resolution (71152 – 1 sample)

##### .1 Routine Review

The inspectors screened items entered into the licensee's corrective action program to identify repetitive equipment failures or specific human performance issues for followup. The inspectors reviewed condition reports, attended screening meetings, or accessed the licensee's computerized corrective action database.

##### .2 Annual Followup of Selected Issues

###### a. Inspection Scope

The inspectors conducted a detailed review of CR 2043826, Root Cause Evaluation Report for failure of Tainter gates to fully open. The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

Documents reviewed are listed in the Attachment.

###### b. Findings

No findings were identified. The regulatory significance of this issue is discussed in more detail in Section 1R12 of this report.

#### 4OA3 Event Follow-up (71153 – 1 sample)

###### a. Inspection Scope

##### Unit 2 Reactor Trip and Safety System Actuation

On August 24, 2016, an automatic reactor trip occurred when personnel were removing the housing cover of the turbine trip block. An inadvertent turbine trip signal was generated when the cover was allowed to contact the turbine trip lever which generated a reactor trip from full power operation. During the ensuing secondary transient, the MDAFW pumps automatically started on low level in the steam generators as expected. The inspectors responded to the control room and evaluated the status of mitigating systems and fission product barriers, equipment and personnel performance, and plant management decisions to assist NRC management in making an informed evaluation of plant conditions. Documents reviewed are listed in the attachment. As appropriate, the inspectors conducted the following actions during the evolutions:

- observed plant parameters and status, including assessment of mitigating system and components required to maintain the plant in a safe configuration and in accordance with TS requirements

- evaluated whether alarms/conditions preceding and following the trip were as expected
- evaluated the proper performance of plant systems and components
- evaluated the appropriateness of operator actions and whether emergency procedures were followed
- confirmed proper NRC classification and reporting of the event

b. Findings

No findings were identified.

4OA5 Other Activities

Operation of an Independent Spent Fuel Storage Installation (ISFSI) (60855.1)

a. Inspection Scope

The inspectors performed a walkdown of the onsite ISFSI and monitored the activities associated with the dry fuel storage campaign completed on August 25, 2016. The inspectors reviewed changes made to the ISFSI programs and procedures, including associated 10 CFR 72.48, "Changes, Tests, and Experiments," screens and evaluations to verify that changes made were consistent with the license or certificate of compliance. The inspectors reviewed records and observed the loading activities to verify that the licensee recorded and maintained the location of each fuel assembly placed in the ISFSI. The inspectors also reviewed surveillance records to verify that daily surveillance requirements were performed as required by TSs. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 13, 2016, the resident inspectors presented the inspection results to Mr. Glover and other members of the licensee's staff. The inspectors confirmed that no proprietary information was retained by the inspectors or documented in this report.

On October 26, 2016, the resident inspectors conducted a re-exit with Mr. J. Krakuszeski and other members of the licensee's staff to discuss the final results of the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

F. Giannone, Training Manager  
T. Giese, Manager, Operations Training  
M. Glover, Site Vice President  
D. Hall, Nuclear Oversight Manager  
G. Hartzler, Chemistry Manager  
D. Hoffman, Organizational Effectiveness Director  
T. Kirwin, Manager, Maintenance  
J. Krakuszeski, Plant General Manager  
M. Murdock, (Acting) General Manager, Engineering  
M. Nelson, (Acting) Manager, Emergency Preparedness  
C. Orr, Manager, Nuclear Work Management  
T. Pilo, (Acting) Regulatory Affairs Manager  
D. Pitsley, Manager, Operations  
C. Sherman, Radiation Protection Superintendent  
J. Wild, Regulatory Affairs

#### **NRC personnel**

J. Zeiler, Senior Resident Inspector

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened and Closed

05000261/2016003-01	NCV	Failure to Scope Tainter Gate Flood Protection Features in Maintenance Rule Resulting in Degraded Performance (Section 1R12)
05000261/2016003-02	NCV	Failure to Assess and Manage Risk for Main Turbine Trip Maintenance Resulting in Turbine/Reactor Trip (Section 1R13)

## **LIST OF DOCUMENTS REVIEWED**

### **Section 1R01: Adverse Weather Protection**

#### Impending Adverse Weather Conditions

##### Procedures

AP-053, Severe Weather Response, Rev. 5

OMM-021, Operation During Adverse Weather Conditions, Rev. 50

##### Condition Reports

CR 2059533, AP-053 severe weather response procedure not documented

#### Readiness to Cope with External Flooding

GID/R87038/0007, Generic Issues Document - Hazard Analysis, Rev. 6

Calculation RNP-C/YSTR-1004, Site PMP Storm Event Inflow and External Flooding Analysis, Rev. 2

Calculation RNP-C/YSTR-1010, Hydrologic and Hydraulic Tainter Gate Evaluation, Rev. 0

AP-053, Severe Weather Response, Rev. 5

OMM-021, Operation During Adverse Weather Conditions, Rev. 50

OP-218, Lake Robinson Spillway Equipment, Rev. 7

### **Section 1R04: Equipment Alignment**

#### Partial Walkdown

##### Procedures

OP-402, Auxiliary Feedwater System, Rev. 97

OP-903, Service Water System, Rev. 144

##### Drawings

G-190197, Feedwater Condensate and Air Evacuation System Flow Diagram, Sheet 4, Rev. 73

G-190199, Service and Cooling Water System Flow Diagram, Sheet 1, Rev. 81

#### Complete Walkdown

##### Procedures

OP-202, Safety Injection and Containment Vessel Spray System, Rev. 98

OWP-004, Containment Spray (CS), Rev. 28

##### Drawings

5379-1082, Safety Injection System Flow Diagram, Sheet 2, Rev. 55

5379-1082, Safety Injection System Flow Diagram, Sheet 3, Rev. 28

5379-1082, Safety Injection System Flow Diagram, Sheet 5, Rev. 40

##### Other documents

DBD/R87038/SD02, Design Basis Document Safety Injection System, Rev. 20

### **Section 1R05: Fire Protection**

#### Procedures

AD-EG-ALL-1520, Transient Combustible Control, Rev. 4

OMM-003, Fire Protection Pre-Plans/Unit No. 2, Rev. 71

##### Drawings

HBR2-11937, Fire Pre-Plan Service Water Pump Intake Area, Sheet 45, Rev. 0

HBR2-11937, Fire Pre-Plan Boron Injection Tank Room, Sheet 39, Rev. 1

HBR2-11937, Fire Pre-Plan Turbine Building/Mezzanine Level, Sheet 58, Rev. 3  
 HBR2-11937, Fire Pre-Plan 4160 Volt Switchgear Room, Sheet 59, Rev. 1  
 HBR2-11937, Fire Pre-Plan Auxiliary Feedwater Pump Room, Sheet 47, Rev. 1

### **Section 1R06: Flood Protection Measures**

#### **Calculations**

RNP-F/PSA-0009, Assessment of Internally Initiated Flood Events, Rev. 2  
 RNP-F/PSA-0104, RNP Internal Flooding PRA Plant Partitioning and Walkdown Data, Rev. 0  
 RNP-F/PSA-0105, Robinson Nuclear Plant Internal Flooding Analysis, Rev. 1  
 RNP-F/PSA-0113, Robinson Nuclear Plant Internal Flooding PRA Quantification and Results Analysis, Rev. 0  
 RNP-M/MECH-1881, Internal Flooding Pipe Breaks for Reactor Auxiliary Building, Rev. 0  
 RNP-M/MECH-1882, Internal Flooding Displacement Evaluation for Reactor Auxiliary Building, Rev. 0  
 RNP-M/MECH-1883, Internal Flooding Analysis Reactor Auxiliary Building, Rev. 0

### **Section 1R07: Heat Sink Performance**

#### **Procedures**

AD-EG-ALL-1401, Heat Exchanger Program, Rev. 1  
 CM-201, Safety Related and Non-Safety Related Heat Exchanger Maintenance, Rev. 56  
 CM-632, EDG Heat Exchanger Maintenance, Rev. 22

#### **Documents Reviewed**

WO 13462951-02  
 WO 12241424-02  
 WO 12266308-02  
 System Health Reports for 2014, 2015 and 1st and 2nd Quarter 2016 for System 5095/5100 – Emergency Diesel Generators and Auxiliaries  
 System Health Reports for 2014, 2015 and 1st and 2nd Quarter 2016 for System 4060 – Service Water  
 EC-03-003, Auxiliary Cooling Water Chemistry Strategic Plan, Rev. 2

#### **Condition Reports**

CR 1997140  
 CR 1989625  
 CR 2027271  
 CR 19944189

### **Section 1R11: Licensed Operator Requalification**

#### **Resident Inspector Quarterly Review of Licensed Operator Requalification**

#### **Procedures**

AOP-001, Malfunction of Reactor Control System, Rev. 33  
 AOP-016, Excessive Primary Leakage, Rev. 24  
 AOP-038, Rapid Downpower, Rev. 3  
 EOP-E-0, Reactor Trip or Safety Injection, Rev. 8  
 EOP-E-1, Loss of Reactor or Secondary Coolant, Rev. 6  
 EOP-ECA-1.1, Loss of Emergency Coolant Recirculation, Rev. 2

#### **Scenario Package**

LOCT DSS-041, 2016 Exam 01, Revision 2



Resident Inspector Quarterly Review of Licensed Operator Performance in the Actual Plant/Main Control Room

Procedures

AD-OP-ALL-1000, Conduct of Operations, Rev. 6  
 OP-105, Maneuvering the Plant When Greater Than 25% Power, Rev. 62  
 OST-201-1, MDAFW System Component Test – Train A, Rev. 37  
 GP-003, Normal Plant Startup From Hot Shutdown to Critical, Rev. 108  
 AD-OP-ALL-0203, Reactivity Management, Rev. 4

**Section 1R12: Maintenance Effectiveness**

Procedures

AD-EG-ALL-1210, Maintenance Rule Program, Rev. 0

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures

AD-WC-ALL-0200, On-Line Work Management, Rev. 6  
 AD-OP-ALL-0201, Protected Equipment, Rev. 1  
 OMM-48, Work Coordination and Risk Assessment, Rev. 63  
 OMA-NGGC-0203, Shutdown Risk Management, Rev. 5  
 OMP-003, Shutdown Safety Function Guidelines, Rev. 56

**Section 1R15: Operability Determinations and Functionality Assessments**

Procedures

AD-OP-ALL-0105, Operability Determination and Functionality Assessments, Rev. 3

**Section 1R18: Plant Modifications**

Procedures

AD-EG-ALL-1155, Post Modification Testing, Rev. 2

**Section 1R19: Post Maintenance Testing**

Procedures

PLP-033, Post Maintenance Testing Program, Rev. 64  
 EMP-024, ODCM Surveillance, Rev. 64  
 CP-EMP-726, Operation of R-20

Other documents

H.B. Robinson Steam Electric Plant, Unit 2 Offsite Dose Calculation Manual, Rev. 34

Condition Reports

CR 2048008

**Section 1R20: Refueling and Other Outage Activities**

Procedures

GP-004, Post Trip Stabilization, Rev. 24  
 GP-002, Cold Shutdown to Hot Subcritical at No Load TAVG, Rev. 138  
 GP-003, Normal Plant Startup From Hot Shutdown to Critical, Rev. 108  
 GP-005, Power Operation, Rev. 130

Other Documents

Reactivity Manipulation Plan, R2C30 Turbine Maintenance Outage II Startup, Rev. 0

**Section 1R22: Surveillance Testing****Procedures**

OMM-015, Operations Surveillance Testing, Rev. 49

**Section 1EP6: Drill Evaluation****Procedures**

EPCLA-01, Emergency Control, Rev. 44

EPNOT-01, CR/EOF Emergency Communicator, Rev. 48

OMM-001-7, Notifications, Rev. 23

**Other Documents**

LOCT DSS-041, 2016 Exam 01, Revision 2

**Section 2RS1: Radiological Hazard Assessment and Exposure Controls****Procedures, Guidance Documents, and Manuals**

AD-PI-ALL-0100, Corrective Action Program, Rev. 5

AD-PI-ALL-0300, Self-Assessment and Benchmark Programs, Rev. 2

AD-RP-ALL-2001, Taking, Counting, and Recording Surveys, Rev. 1

AD-RP-ALL-2202, ED Alarms, Rev. 1

AD-RP-ALL-2003, Investigation of Unusual Radiological Occurrences, Rev. 1

AD-RP-ALL-2005, Posting of Radiological Hazards, Rev. 1

AD-RP-ALL-2009, Personnel Contamination Monitoring and Reporting, Rev. 1

AD-RP-ALL-2011, Radiation Protection Briefings, Rev. 1

AD-RP-ALL-2014, Work in Alpha Environments, Rev. 2

AD-RP-ALL-2017, Access Controls for High, Locked High, and Very High Radiation Areas, Rev. 2

AD-RP-ALL-3001, Control of Radioactive Material and Use of Radioactive Material Labels, Rev. 1

AD-RP-ALL-3002, Unconditional Release of Material, Rev. 0

FMP-021, Control of Materials in the Spent Fuel Pit, Rev. 19

HPP-001, Radiologically Controlled Area Surveillance Program, Rev. 127

HPP-002, Containment Vessel Surveillance Program, Rev. 44

HPP-004, Radiological Control of Tools and Equipment, Rev. 70

HPP-010, Control of Radioactive Materials Outside of the Primary Radiation Control Area, Rev. 22

HPP-018, Control and Inventory of Radioactive Sources, Rev. 28

HPP-RWT-004, Spent Resin Transfer to Waste Processing Containers, Rev. 0

HPP-SUR-006, Discrete Radioactive Particle Control, Rev. 0

RST-004, Sealed Source Leak Test, Rev. 49

**Records and Data Reviewed**

Attachments 1, <<HRS, LHRA, and VHRA Posting Checklist>>, ADP-RP-ALL-2017, Access Controls for High, Locked High, and Very High Radiation Areas, Rev. 2, Areas Involved in Posting Change and Reason: Demin Room, 06/29/30; Drumming Room, 06/29/16; RW Bldg Truck Bay, Bunker and 2nd Level, 06/29/16; and WWDS/Drumming Room, 06/29/16

Attachment 6, Sealed Source Leak Test Certification and Review Form, RST-004, Sealed Source Leak Test, Rev. 49, 06/21/15; and 12/15/15

Attachment 10.5, Radioactive Source Inventory Cover Sheet, HPP-018, Control and Inventory of Radioactive Sources, Rev. 28, 06/27/15; and 12/22/15

Confirmation of Annual NSTS Inventory Reconciliation, Dated 12/30/15

HPP-RWT-004, Spent Resin Transfer to Waste Processing Containers, Rev. 0, 06/29/16

Radiation Control Air Sample Analysis Forms, Sample #s: AS-20151117-001, CV-3rd Level, 11/17/15; AS-20151128-001, CV-1<sup>st</sup> Level, 11/28/15; AS-20151128-003, CV-3rd Level – O/S Pressurizer, 11/28/15; AS-20160601-002, Seal Table Room, 06/01/16; and AS-20160630-001, Radwaste Bunker Area, 06/30/16

Radiation Work Permit (RWP) No. 47, Task Nos.1, CV Misc. Vibrations, Lubrications, PMs, and Inspections O/S Bio-Wall, Rev. 19; 2, Mechanical Maintenance, BA Inspections/ Cleaning, Perform ESTs in CV with Reactor Critical O/S Bio-Wall, Rev. 19; 3, Operations Activities in CV with Reactor Critical O/S Bio-Wall, Rev. 19; 6, RP Coverage/Activities in CV with Reactor Critical O/S Bio-Wall, Rev. 19; and 12, CV Seal Table Room with Reactor Critical, Rev. 19  
RWP No. 2000, Task Nos. 4, Forced Outage Work Activities with Medium Radiological Risk, Rev. 06; 6, Filter Changes and Associated Activities Medium Risk, Rev. 06; and 8, Forced Outage Work Activities in HRA/LHRA with Low Radiological Risk, Rev. 06

Robinson Nuclear Plant, Radiological Survey, Surveys: RNP-M-20151117-2, HPP-001 Post Shutdown Survey, 11/17/15; RNP-M-20151120-4, Replacement of RTD (TE-141), 11/20/15; RNP-M-20151130-3, Dose Rate Verification Survey in Middle Pipe Alley, 11/30/15; RNP-M-20160601-4, CV 1<sup>st</sup> & 2<sup>nd</sup> Level Boric Acid Walkdown, 06/01/16; RNP-M-20160601-5, Quarterly Power CV Entry, Vibrations, 06/01/16; RNP-M-20160601-6, PLP-006 and OST-924, 06/01/16; RNP-M-20160601-9, Post-Decon Survey, 06/01/16; RNP-M-20160601-12, Quarterly Entry/Seal Table Inspection, 06/01/16; RNP-M-20160629-4, Downpost Survey, Resin Sluice, 06/29/16; RNP-M-20160629-5, Downpost Survey, Resin Sluice, 06/29/16; RNP-M-20160629-6, Demineralizer Room-Flushing Resin Lines, 06/29/16; RNP-M-20160629-7, Post Sluice Survey, 06/29/16; RNP-M-20160629-8, Pre Resin Line Clog Removal, 06/29/16; RNP-M-20160629-9, Post Resin Clog Removal Survey, 06/29/16; and RNP-M-20160629-10, Post Resin Line Clog Removal, 06/29/16

Spent Fuel Pool Log Sheet, Updated 05/30/15 and 06/01/15

#### Corrective Action Documents (CAP) Documents

CRs 750531, 750621, 755020, and 2041964

NOS Audit Report, Robinson Radiation Protection 10 CFR 20 Audit, 2015-RNP-RP Part 20-01, 07/29/15

Quick Hitter Self-Assessment Reports, Self-Assessment Nos.: 744899, Self-Assessment Title: ED Alarm Review, 09/25/15; and 00744903, Assignment 7, Radiation Work Permit (RWP) Alarm Set-Point Review, 11/19/15

### **Section 2RS6: Radioactive Gaseous and Liquid Effluent Treatment**

#### Procedures

HB Robinson Steam Electric Plant, Unit 2, Offsite Dose Calculation Manual (ODCM), Rev 34

EMP-013, Operation of R-14 and F-14, Rev. 58

EMP-018, R-14 Gaseous High Level Sample Retrieval and Analysis, Rev. 9

EMP-024, ODCM Surveillance, Rev. 64

CP-RST-918, Radiation Monitor R-18 Channel Calibration, Rev. 2

RST-012, Calibration of Radiation Monitoring System Monitor R-14

RST-017, Calibration of Radiation Monitoring System Monitors R-37 and R-19A, B and C, Rev. 17

#### Calibrations and Data

CP-RST-918, Radiation Monitor R-18 Channel Calibration, 12/19/2013 and 07/15/2015

RST-012, Calibration of Radiation Monitoring System Monitor R-14, 9/25/14 and 01/21/16

RST-017, Calibration of R-37, 08/05/2015

RST-017, Calibration of R-19A, 01/12/2015 and 11/22/2015

RST-017, Calibration of R-19A,B and C, 01/12/2015

Radioactive Source Certification Sheets: SNs 90CS2203849, 90CS2203850, and 90CS2203851 for R-18 (5/4/94); SNs 962-59-2, 102-90-6, and 1052-90-7 for R-14 (5/4/05) SN E9-739 (3/1/08)

**Section 2RS8: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation**

Procedures, Manuals, and Guides

AD-PI-ALL-0100, Corrective Action Program, Rev. 5  
 AD-PI-ALL-0300, Self-Assessment and Benchmark Programs, Rev. 2  
 AD-RP-ALL-3003, Outside Radioactive Material Container Inventory and Control, Rev. 1  
 AD-RP-ALL-5000, Preparation and Shipment of Radioactive Waste, Rev. 0  
 AD-RP-ALL-5001, Preparation and Shipment of Radioactive Material, Rev. 0  
 AD-RP-ALL-5002, 10 CFR 61 Waste Classification, Rev. 0  
 CP-124, WWDS Pressure Vessel Media Sluices, Rev. 16  
 CS-OP-PR-008, Setup and Operation of Self-Engaging Dewatering System Fillhead, Rev. 4  
 H. B. Robinson – Unit 2 Process Control Program (PCP), Rev. 6  
 HPP-007, Handling and Storage of Contaminated and Radioactive Materials, Rev. 45  
 HPP-010, Control of Radioactive Materials Outside the Primary Radiation Control Area, Rev. 22  
 HPP-018, Control and Inventory of Radioactive Sources, Rev. 28  
 HPP-RWT-005, Use and Dewatering Verification of Energy Solutions High Integrity Containers Containing Filters, Rev. 0  
 HPP-RWT-006, Dewatering Energy Solutions Waste Processing Containers containing Filters, Rev. 2  
 HPS-NGGC-0002, Vendor Cask Utilization Procedure, Rev. 23  
 OP-704, Spent Resin Storage Tank, Rev. 51

Shipping Records and Radwaste Data

AD-RP-ALL-3003, Attachment 2, Outside Container Inventory Log, 6/29/2016  
 Lesson Plan, RC6C003G, Radioactive Material Shipping and Regulatory Awareness, Rev. 10  
 Qualification Records (radwaste/material shipment, SEDS operator, 10 CFR Part 61 characterization) for selected personnel  
 Qualification Card, QCC-RC-28, RECEIPT OF RADIOACTIVE MATERIALS, Rev. 12  
 Qualification Card, QCC-RC-30, RADIOACTIVE MATERIAL CHARACTERIZATION, Rev. 9  
 Qualification Card, QCC-RC-31, PACKAGING RADIOACTIVE MATERIAL FOR SHIPMENT, Rev. 12  
 Radioactive Material Shipping Logs, 2014, 2015, and 2016 (thru 5/19/2016)  
 RADMAN Database Report for Robinson Nuclear Power Plant, Change 78, 01/14/2016  
 Shipment 14-0073, LSA, Filters  
 Shipment 14-0089, LSA, Resin  
 Shipment 15-0010, LSA, Resin  
 Shipment 15-0012, LSA, DAW  
 Shipment 15-0035, LSA, DAW  
 Shipment 16-0013, LSA, Filters  
 Shipment 16-0027, LSA, DAW  
 Shipment 16-0038, Exempt Quantity, RCP Motor  
 Sample Data Set Evaluation Form, DAW, 01/06/2016  
 Sample Data Set Evaluation Form, RCS Filters, 01/06/2016  
 Sample Data Set Evaluation Form, WWDS Filters, 01/07/2016  
 10 CFR Part 61 Waste Stream Characterizations; DAW 2014 and 2015; RCS Filters 2014 and 2015; Spent Resin Storage Tank 2014; Spent Fuel Pool Filters 2016; WWDS Filters 2013 and 2015

2014 Annual Radioactive Effluent Release Report, 04/28/2015  
 2015 Annual Radioactive Effluent Release Report, 04/21/2016

#### CAP Documents

Self-Assessment Number 01993185, Radwaste Quick Hit Self-Assessment Report, 04/21/2016  
 CRs 754565, 1943406, 1966477, 1969768, 2007502, 2008087, 2008342, 2026788, and  
 2026794

#### **Section 40A1: Performance Indicator Verification**

##### Procedures and Guidance Documents

AD-LS-ALL-0004, NRC Performance Indicators and Monthly Operating Report, Rev. 1  
 AD-BO-ALL-0002, Performance Measures Program, Rev. 3  
 RNP-M/MECH-1904, RNP NRC Mitigating System Performance Index (MSPI) Basis Document,  
 Rev. 2

#### **Section 40A2: Problem Identification and Resolution**

##### Procedures

AD-PI-ALL-0100, Corrective Action Program, Rev. 6  
 AD-PI-ALL-0101, Root Cause Evaluation, Rev. 2  
 AD-PI-ALL-0102, Apparent Cause Evaluation, Rev. 2  
 AD-PI-ALL-0103, Quick Cause Evaluation, Rev. 2  
 AD-PI-ALL-0104, Prompt Investigation Response Team, Rev. 2  
 AD-LS-ALL-0006, Notification/Reportability Evaluation, Rev. 1  
 AD-EG-ALL-1311, Failure Investigation Process (FIP), Rev. 0

#### **Section 40A3: Follow-up of Events and Notices of Enforcement Discretion**

##### Procedures

EOP-E-0, Reactor Trip or Safety Injection, Rev. 7  
 EOP-ES-0.1, Reactor Trip Response, Rev. 8  
 GP-004, Post Trip Stabilization, Rev. 24  
 OMM-001-6, Operations Assessments, Rev. 36  
 OMM-001-7, Notifications, Rev. 23

#### Condition Reports

CRs 2055272 and 2056554

#### **Section 40A5: Other Activities**

##### Operation of an Independent Spent Fuel Storage Installation (ISFSI)

##### Procedures

ISFS-101, ISFSI Equipment Receipt, Setup and Checkout, Rev. 1  
 ISFS-102, ISFS DSC Loading and Storage, Rev. 3  
 ISFS-103, ISFSI HSM Temperature Monitoring, Rev. 1  
 ISFS-105, NUHOMS 24PTH Dry Storage Canister Welding, Rev. 1  
 ISFS-009, 7P-ISFSI High Radiation, Rev. 6  
 ISFS-022, Cask Preparation Area HVAC and HEPA Filter Operation, Rev.6  
 AD-EG-ALL-1005, Conduct of Dry Storage, Rev. 1

#### Other Documents

Certificate of Compliance for Spent Fuel Storage Cask #1004, Amendment 13  
 ALARA Plan #2016RNP2Cycle30-05, 2016 Dry Fuel Storage Campaign

Condition Reports

CR 2049727 (Unplanned TS Entry 'DSC Xfer to the HSM')

CR 2049695 (72.48 Screen ISFS-102 Change)

CR 2047305 (72.48 Screen PLP-130 Change)

CR 2046709 (72.48 Screen ISFS-102 Change)

CR 2041189 (72.48 Screen ISFS-022 Change)

CR 1967258 (72.48 Screen OCA Drainage Correction)