



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

January 27, 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 05000261/2015004

Dear Mr. Glover:

On December 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your H. B. Robinson Steam Electric Plant, Unit 2. On January 20, 2016, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

No NRC-identified or self-revealing findings were identified during this inspection.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

George T. Hopper, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket No.: 50-261
License No.: DPR-23

Enclosure:
IR 05000261/2015004
w/Attachment: Supplementary Information

cc Distribution via Listserv

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05000261/2015004

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R. Glover

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Letter to Richard Michael Glover from George T. Hopper dated January 27, 2016

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION
REPORT 05000261/2015004

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No: 50-261

License No: DPR-23

Report No: 005000261/2015004

Licensee: Duke Energy Progress, Inc.

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

Location: 3581 West Entrance Road
Hartsville, SC 29550

Dates: October 1, 2015 through December 31, 2015

Inspectors: K. Ellis, Senior Resident Inspector
C. Scott, Senior Resident Inspector (Acting)
J. Parent, Resident Inspector (Acting)
A. Butcavage, Reactor Inspector, 1R07
M. Bates, Sr. Operations Engineer, 1R11

Approved by: George T. Hopper, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000261/2015004, October 1, 2015, through December 31, 2015; Duke Energy Progress, Inc., H.B. Robinson Steam Electric Plant, Unit 2, Integrated Inspection Report.

The report covered a three-month period of inspection by resident inspectors and regional inspectors. No findings were identified during this inspection period. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period at 100 percent rated thermal power (RTP). The unit was shutdown for a planned maintenance outage on November 16, 2015, to replace four turbine blades. The unit returned to 100 percent RTP on November 29, 2015, and remained there 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 heavy rainfall on October 1-2, 2015. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures, including operator staffing, before the onset of the adverse weather conditions. The inspectors reviewed the licensee's plans to address the ramifications of potentially lasting effects that may result from heavy rainfall. 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 Seasonal Extreme Weather Conditions

The inspectors conducted a detailed review of the station's adverse weather procedures written for extreme low temperatures. The inspectors verified that weather-related equipment deficiencies identified during the previous year had been placed into the work control process and/or corrected before the onset of seasonal extremes. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures before the onset of and during seasonal extreme weather conditions. Documents reviewed are listed in the Attachment. The inspectors evaluated the following risk-significant systems:

- service water system
- fuel oil system

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04 – 2 samples)a. Inspection ScopePartial 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:

- 'A' residual heat removal pump (RHR) in-service for shutdown cooling
- motor-driven auxiliary feedwater system (MDAFW) when used for decay heat removal option

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 5 samples)a. Inspection ScopeQuarterly 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.

- HVAC Equipment Room for Control Room, fire zone 17
- 4KV Switchgear Room, fire zone 25E
- Service Water Pump/Intake Area, fire zone 29
- Auxiliary Feedwater Room, fire zone 6
- [Dedicated Shutdown] D.S. Diesel Enclosure, fire zone 25D

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T – 5 samples)

a. Inspection Scope

Triennial Review of Heat Sink Performance

The inspectors reviewed operability determinations, completed surveillances, vendor manual information, associated calculations, and inspection results associated with the 'A' component cooling water (CCW) heat exchanger, and the 'B' CCW heat exchanger. These heat exchangers were chosen based on their risk significance in the licensee's probabilistic safety analysis and their important safety-related mitigating system support functions.

For the CCW heat exchangers, the inspectors reviewed the methods and results of heat exchanger inspections. The inspectors evaluated whether the methods used to inspect and clean heat exchangers were consistent with as-found conditions identified and expected degradation trends and industry standards; the licensee's inspection and cleaning activities had established acceptance criteria consistent with industry standards; and the as-found results were recorded, evaluated, and appropriately dispositioned so that the as-left condition was acceptable.

In addition, the inspectors determined whether the condition and operation of the CCW heat exchangers were consistent with design assumptions in heat transfer calculations, and as described in selected calculations. This included determining whether the number of plugged tubes reported during inspection of the heat exchangers in the field was within pre-established limits, based on established tube plugging criteria contained in selected calculations. The inspectors determined whether the licensee evaluated the potential for water hammer and established adequate controls and operational limits, to prevent heat exchanger degradation due to excessive flow-induced vibration during operation. In addition, work orders (WOs) associated with visual inspection records were reviewed to determine the integrity of the heat exchanger.

The inspectors also reviewed the licensee's approach to maintaining smaller heat exchangers such as the lube oil coolers associated with the steam-driven auxiliary feedwater pump, and MDAFW pump lube oil coolers. The inspectors reviewed selected WOs to determine whether the methods used to inspect and clean heat exchangers were consistent with as-found conditions identified and expected degradation trends and industry standards; the licensee's inspection and cleaning activities had established acceptance criteria consistent with industry standards; and the as-found results were recorded, evaluated, and appropriately dispositioned so that the as-left condition was acceptable.

For the ultimate heat sink (UHS) dam, the inspectors determined whether the performance of UHS, and their subcomponents such as piping, intake screens, pumps, valves, etc., was appropriately evaluated by tests or other equivalent methods, to ensure availability and accessibility to the in-plant cooling water systems. The inspectors determined whether the licensee's inspection of the UHS was thorough and of sufficient

depth to identify degradation of the shoreline protection, or loss of structural integrity. This included determination whether vegetation present along the slopes was trimmed, maintained, and was not adversely impacting the embankment.

In addition, the inspectors discussed with the system engineer whether the licensee ensured sufficient reservoir capacity by trending and removing debris, or sediment buildup in the UHS. This sample included a walkdown of the dam structure, and discussions with the system engineer on recent upgrades to one of the dam level control Tainter gates. Discussions were also held regarding the seepage in the vicinity of the toe of the dam, as documented by the licensee in Long Term Asset Management (LTAM) RNP-14-0047.

The inspector also performed a walkdown of the accessible portions of the service water intake structure, to determine whether the licensee's assessment on structural integrity and component functionality was adequate, and that the licensee ensured proper functioning of traveling screens and strainers, and structural integrity of component mounts. In addition, the inspectors discussed with the system engineer whether service water pump bay silt accumulation was monitored, trended, and maintained at an acceptable level by the licensee, and that water level instruments were functional and routinely monitored. The inspectors also determined whether the licensee's ability to ensure functionality during adverse weather conditions was adequate. Inspectors completed sample observations of in-progress work on outdoor piping heat trace elements and insulation in the vicinity of the intake structure. The inspectors also performed a walkdown inspection of accessible portions of the UHS buried supply pipe routing from the intake structure to the plant structure, to look for possible telltale signs of settlement or leakage conditions that may be indicative of loss of pipe leak-tight integrity or piping structural discontinuities.

The inspectors reviewed a sample of the licensee procedures for flow testing of the service water pumps to determine if pump testing and valve stroke criteria is consistent with industry standards established by the American Society of Mechanical Engineers, Operation and Maintenance Code, and plant-specific design requirements.

In addition, the inspectors reviewed system health reports and condition reports (CRs) related to the heat exchangers and heat sink performance issues, to determine whether the licensee had an appropriate threshold for identifying issues, and to evaluate the effectiveness of the corrective actions. The documents that were reviewed are included in the Attachment to this report, including the system health reports that include discussion of corrective measures completed or planned for the identified concerns. At the request of the resident inspector, the inspectors determined whether the licensee's inspection of the forced draft cooling system enclosure structure, used in conjunction with the dedicated shutdown diesel generator cooler, was maintained in accordance with the system design intent.

An additional sample of the plant's response to operating experience (OE) concerning the RHR system heat exchanger maintenance was also conducted. Discussions with system engineers concerning the RHR system heat exchanger testing were conducted, and included a review of the proposed solution of the CR related to LTAM RNP-15-0062 concerning OE on a similar plant that did not establish a test plan to demonstrate RHR heat exchanger heat transfer capability. This review was conducted to determine if the proposed solution would provide reasonable assurance of the RHR heat exchanger heat

transfer capabilities, and that an operability assessment was recorded. Additional RHR heat exchanger condition monitoring actions are included in the proposed solutions of LTAM RNP-15-0062 and action request 01960415.

These inspection activities constituted five heat sink inspection samples as defined in Inspection Procedure (IP) 71111.07-05. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11 – 4 samples)

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification

The inspectors observed two evaluated simulator scenarios administered to an operating crew conducted in accordance with the licensee's accredited requalification training program. The scenario on October 28, 2015, evaluated the operators' ability to respond to a tube rupture of the 'A' steam generator (SG), failure of the steam dumps to operate and failure of the 'A' SG power operated relief valve. The scenario on November 15, 2015, evaluated the operators' ability to perform a scheduled plant shutdown to zero percent reactor power, and perform a cooldown to establish hot shutdown conditions. 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 Unit 2 reactor shutdown for a planned maintenance outage on November 16, 2015. The inspectors reviewed the operator performance and adherence to the operating procedures.

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.

.3 Annual Review of Licensee Requalification Examination Results

On April 3, 2015, the licensee completed the comprehensive biennial requalification written examinations and the annual requalification operating examinations required to be administered to all licensed operators in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 55.59(a)(2), "Requalification Requirements," of the NRC's "Operator's Licenses." The inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations, written examinations, and the crew simulator operating examinations in accordance with IP 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results," of IP 71111.11.

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. The inspectors also interviewed system engineers and the maintenance rule coordinator to assess the accuracy of performance deficiencies and extent of condition. Documents reviewed are listed in the Attachment.

- CR 1968817, 'C' Auxiliary Feedwater Diesel Generator Trip and Alarm Locked in
- CR 1975684, Control Rods did not insert automatically
- Performance review of the main control room heating and ventilation air conditioning

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 3 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.

- October 19-25, 2015, Qualitative Yellow Risk with 'A', 'B', and 'C' main feedwater regulator valves in manual
- December 4, 2015, dedicated shutdown diesel generator out of service for 2-year preventive maintenance outage
- Reviewed the risk mitigation plan for the planned maintenance outage, from November 16-29, 2015

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 1 sample)

a. Inspection Scope

Operator Work-Around Review

The inspectors performed a detailed review of the licensee's operator work-around, operator burden, and control room deficiency lists for the station in effect on December 18, 2015, to verify that the licensee identified operator work-arounds at an appropriate threshold and entered them in the corrective action program. The inspectors verified that the licensee identified the full extent of issues, performed appropriate evaluations, and planned appropriate corrective actions. The inspectors also reviewed compensatory actions and their cumulative effects on plant operation. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 3 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 13407992-02, OST-201-1, MDAFW System Component Test –Train A following inspection of the V2-16C, 'C' MDAFW discharge to S/G C
- WO 20036353-05, LP-I-TURB-PRESS-CNTL, Turbine First Stage Pressure Control following replacement of NUS Modules for Rod Speed Control

- WO 13314434-02, OST-902-1, Containment Fan Coolers Component Test 'A' Train following relay replacement for HVH-2

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 turbine blades, from November 16, 2015 through November 29, 2015, the inspectors evaluated the following outage activities:

- outage planning
- shutdown, cooldown, heat-up, and start-up
- reactor coolant system instrumentation and electrical power configuration
- reactivity
- 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 mitigation strategies for loss of key safety functions
- adhered to operating license and technical specification 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 – 5 samples)

a. Inspection Scope

The inspectors reviewed the surveillance tests listed below and either observed the test or reviewed test results to verify testing adequately demonstrated equipment operability and met technical specification and licensee procedural requirements. 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

- OST-201-2, MDAFW System Component Test – Train ‘B’
- OST-202, Steam Driven Auxiliary Feedwater System Component Test
- OST-751, Control Room HVAC R-1 Initiation and ERFIS Point Test (Quarterly)
- 2015 Control Room Tracer Gas In-leakage Testing

RCS Leakrate

- OST-051, Reactor Coolant System Leakage Evaluation

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

40A1 Performance Indicator Verification (71151 – 1 sample)

a. Inspection Scope

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for Unit 2 PIs listed below. The inspectors reviewed plant records compiled between October 1, 2014, and September 30, 2015, 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: Mitigating Systems

- high pressure injection system

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 samples)

.1 Routine Review

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

.2 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors conducted a detailed review of CR 752914, Two Unexpected Station Blackout Sequence Actuations.

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 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.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors reviewed issues entered in the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues and human performance trends but also considered the results of inspector daily condition report screenings, licensee trending efforts, and licensee human performance results. The review nominally considered the 6-month period of July 2015 through December 2015 although some examples extended beyond those dates when the scope of the trend warranted. The inspectors compared their results with the licensee's analysis of trends. Additionally, the inspectors reviewed the adequacy of corrective actions associated with a sample of the issues identified in the licensee's trend reports.

The inspectors also reviewed corrective action documents that were processed by the licensee to identify potential adverse trends in the condition of structures, systems, and/or components as evidenced by acceptance of long-standing non-conforming or degraded conditions. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (1 sample)

(Closed) LER 2015-002-01, Pressurizer Power Operated Relief Valve (PORV) Limit Switches' Qualified Life Exceeded Due to Miscalculation.

a. Inspection Scope

On February 18, 2015, it was determined that qualified life calculation for the NAMCO limit switches for the pressurizer PORVs was incorrect. These limit switches are used as post-accident monitoring (PAM) instrumentation to provide position indication of the PORV to the control room operators during a design basis accident (DBA), which is a requirement of TS 3.3.3. The qualified life calculation was revised on March 19, 2015, and revealed that the NAMCO limit switches were no longer qualified for their monitoring function during and following a DBA. This resulted in the function of PORV position being inoperable for a period of time greater than allowed by TS 3.3.3 PAM Instrumentation Limiting Condition for Operation. The licensee determined the cause of the miscalculated qualified life was a result of the calculation not being adequately checked by utility engineering personnel or by the person who performed the design verification. The licensee entered this issue in the corrective action program as CR 738953, implemented an interim standing instruction for alternate methods of monitoring PORV position, and finally replaced the switches during refueling outage 29 which began May 12, 2015. Revision 1 was issued to include the event date.

b. Findings

The enforcement aspects of this LER were documented in IR 05000261/2015003 Section 4OA7, Licensee-Identified Violations. Revision 1 of the LER was reviewed. No additional findings or violations of NRC requirements were identified. This LER is closed.

4OA5 Other Activities

(Closed) Unresolved item (URI) 05000261/2015003-01: Failure of Refueling Water Storage Tank (RWST) Discharge Valve to Close on Demand

a. Inspection Scope

Introduction: The inspectors continued the review of an unresolved item associated with the failure of SI-864A, Reactor Water Storage Tank discharge valve to close on demand during surveillance testing. The URI was opened to review the licensee's cause evaluation and determine if a performance deficiency existed.

Description: On May 18, 2015, with the plant in Mode 6, the 'A' RWST discharge valve, SI-864A failed to stroke close on demand, from the control board, during engineering surveillance testing. Troubleshooting revealed that the thermal overload relay within the breaker that supplies power to the MOV actuator was tripped, which rendered the 'A' emergency core cooling system train inoperable. Following discovery of this issue, maintenance personnel manually reset the thermal overload and cycled the valve closed. Additionally, the licensee replaced the thermal overload relay and performed post-maintenance testing. The licensee documented this issue in CR 749789 and initiated a cause evaluation. The licensee's cause evaluation was unable to determine the exact time and cause of the tripped thermal overload relay for SI-864A.

The inspectors reviewed the licensee's cause evaluation and the results of a vendor analysis of the failed component. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified. The inspectors concluded that a performance deficiency did not exist based on the information available.

4OA6 Meetings, Including Exit

On January 20, 2016, the resident inspectors presented the inspection results to Mr. Glover and other members of the licensee's staff. The inspectors confirmed that proprietary information was not retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

C. Caudell, Regulatory Affairs
J. Conder, Assistant Operations Training Manager
T. Cosgrove, Plant General Manager
S. Connelly, Licensing
F. Giannone, Training Manager
M. Glover, Site Vice President
E. Hedderman, Chemistry Manager
R. Hightower, Licensing/Reg. Programs Supervisor
D. Hoffman, Nuclear Oversight Manager
K. Holbrook, Operations Manager
M. Pastva, Jr., Nuclear Regulatory Affairs
S. Peavyhouse, Organizational Effectiveness Director
J. Rackley, Training Supervisor
C. Sherman, Radiation Protection Superintendent
C. Spencer, Welding Engineer

NRC personnel

G. Hopper, Chief, Reactor Projects Branch 4

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

05000261/2015-002-01	LER	Pressurizer Power Operated Relief Valve (PORV) Limit Switches Qualified Life Exceeded Due to Miscalculation
05000261/2015003-01	URI	Failure of Refueling Water Storage Tank (RWST) Discharge Valve to Close on Demand

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

AP-058, Seasonal Readiness, Rev. 2

OP-925, Cold Weather Operation, Rev. 64

Section 1R04: Equipment Alignment

Procedures

OP-201, Residual Heat Removal System, Rev. 71

OP-402, Auxiliary Feedwater System Checklist, Rev. 96

Section 1R05: Fire Protection

Procedures

OMM-003 (section 8.26), HVAC Equipment Room for Control Room, Rev. 71

OMM-003 (section 8.55), 4KV Switchgear Room, Rev. 71

OMM-003 (section 8.41), Service Water Pump/Intake Area, Rev. 71

OST-610, Unit 2 Portable Fire Extinguishers, Fire Hose Stations & Houses (Monthly), Rev. 57

Drawings

HBR2-11937, Fire Pre-Plan HVAC Equipment Room for Control Room, Sheet 37, Rev. 1

HBR2-11937, Fire Pre-Plan 4160 V Switchgear Room, Sheet 59, Rev. 1

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

HBR2-11937, Fire Pre-Plan D.S. Diesel Enclosure, Sheet 52, Rev. 1

HBR2-11937, Fire Pre-Plan Auxiliary Feedwater Pump Room, Sheet 47, Rev.1

Section 1R07T: Heat Sink Performance

Drawings

G-190199, Service and Cooling Water System Flow Diagram, Sheet 1, Rev. 80

G-190199, Service and Cooling Water System Flow Diagram, Sheet 2, Rev. 69

G-190199, Service and Cooling Water System Flow Diagram, Sheet 9, Rev. 60

G-190199, Service and Cooling Water System Flow Diagram, Sheet 10, Rev. 47

Procedures

CM-201, H. B. Robinson Steam Electric Plant Unit No. 2, Safety-Related and Nonsafety-Related Heat Exchanger Maintenance, Rev. 56

CP-001, Robinson Unit-2, Technical Procedure (Operating), Chemistry Monitoring Program, Rev. 126

CP-SEC-308, Robinson Unit 2, Technical Procedure (Operating) Chlorination, Rev. 5

EPP-28, H. B. Robinson Steam Electric Plant Unit No. 2, Loss of Ultimate Heat Sink, Rev. 19

EPP-28-BD, H. B. Robinson Steam Electric Plant Unit No. 2, EPP-28 Basis Document, Rev. 19

OP-306, Robinson Unit 2, System Operating Procedure Safety Related Component Cooling Water System, Section 3.0, Item 26, Rev. 74

OP-903, Robinson Unit 2, Technical Procedure (Operating), Service Water System, Rev. 141

Condition Reports

NCR-1959315, (NRC-identified) DSDG Cooler Sheet Metal Housing Enclosure Corrosion, 9/30/2015

Action Requests

AR 01953031, (NRC-identified) Admin Error in FSAR Figure 9.2.2-2, 9/14/2015
 AR 01960415, NRC Question on Assurance that RHR Heat Exchanger will meet Requirements, 10/2/2015
 AR 262601-13, Attachment 4, SER 2-05 Gas Intrusion, Rev. 1

Work Orders

01127879-01, Perform Underground Concrete Pipe Inspection, CW-12-30, 10/7/2013
 01962215-01, Cleaning and Inspection of "A" CCW Heat Exchanger, 10/5/2013
 01979591-01, Remove, Inspect and Install the Suction Strainer on the Steam Driven Auxiliary Feedwater pump, 3/20/2013
 01979592-01, Clean and Inspect the Steam Driven Lube Oil Heat Exchanger, 3/20/2013
 02179849-01, Clean and Test "B" Motor Driven, Lube Oil Pump Cooler, 4/22/2014
 02275707-01, Cleaning and Inspection of "B" CCW Heat Exchanger, 6/1/2015
 02037023-01, Perform Pipe Inspection on CW-11-30, Underground Pipe, 5/26/2015

Other

LTAM RNP-14-0047, Dam Monitoring of Potential Seepage, 3/17/14
 LTAM RNP-15-0062, RHR Heat Exchanger Testing, 9/18/15
 99-00354, Engineering Service Request (ESR), CCW Hx SW Discharge Piping Replacement, 6/2/2000
 Eason Diving and Marine Contractors, Inc, Technical Work Order, Inspector Comments for North Pump Bay, 5/29/2015
 NUREG-1785, Docket No. 50-261, Safety Evaluation Report Related to the License Renewal of H.B. Robinson Steam Electric Plant Unit-2, March 2004
 OST-302-3 Comprehensive Flow Test for Service Water Pumps A & B, Rev. 34
 OST-302-4 Comprehensive Flow Test for Service Water Pumps C & D, Rev. 27
 TMM-004, Inservice Testing Program, Rev. 87
 RNP-M/MECH-1653, Nuclear Generation Group, Robinson Nuclear Plant, Service Water System Hydraulic Evaluation, Rev. 3
 Service Water System Health Report, Robinson Nuclear Plant, Unit-2, Second Quarter, 2015
 Service Water System Health Report, Robinson Nuclear Plant, Unit-2, First Quarter, 2014
 Service Water System Health Report, Robinson Nuclear Plant, Unit-2, First Quarter, 2013
 Component Cooling Water System Health Report, Robinson Nuclear Plant, Unit-2, Second Quarter, 2015
 Component Cooling Water System Health Report, Robinson Nuclear Plant, Unit-2, First Quarter, 2014
 Component Cooling Water System Health Report, Robinson Nuclear Plant, Unit-2, First Quarter, 2013

Section 1R11: Licensed Operator RegualificationProcedures

GP-006-1, Normal Plant Shutdown from Power Operation to Hot Shutdown, Rev. 11
 GP-007, Plant Cooldown from Mode 3 to Mode 5, Rev. 102
 OP-201, Residual Heat Removal System, Rev. 71
 OP-603, Electrical Distribution, Rev. 123

Scenario Packages

LOCT Simulator Exercise Guide: LOCT 1502R-S4, Revision 0

Section 1R12: Maintenance EffectivenessOther documents

Maintenance Rule Scoping and Performance Criteria, Main Control Room HVAC System
 Maintenance Rule Expert Panel Meeting Minutes Sept 3, 2015
 MR A(1) Action Plan: Water Cooled Condensing Units

Action Requests

754283, WCCU-1B would not start
 1968817-01, MREV: 'C' AFW Diesel Generator Tripping on Pump Start
 1975684, MREV: Control Rods did not insert automatically

Work Orders

13482523-01, AFW-PMP-C-GEN Automatic Voltage Regulator Board

Procedures

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

Section 1R13: Maintenance Risk Assessments and Emergent Work EvaluationProcedures

AD-WC-ALL-0200, On-line Work Management, Rev.5
 OMM-048, Work Coordination and Risk Assessment Levels, Rev. 59

Other documents

15W 43-07 RNP Risk Profile, October 19 to 25, 2015 'B' Train Work Week
 15W34 RNP Risk Profile, August 17 to 23, 2015 'B' Train Work Week, Rev.1

Section 1R15: Operability EvaluationsProcedures

AD-OP-ALL-0204, Plant Status Control, Rev.1
 OPS-NGGC-1308, Plant Status Control, Rev.7
 OMM-001-8, Control of Equipment and System Status, Rev.52

Work Orders

02293937-01, Inspect MCC-5(9M)
 1811083-01, Adjust HVS-2 Overload Reset Pushbutton
 13524604-02, SI-864A Failed to Close, Troubleshoot

Action Requests

CR 749789, SI-864A failed to operate on demand

Section 1R19: Post Maintenance TestingProcedures

PLP-033, Post Maintenance Testing Program, Rev. 89

Work Orders

20036353-01, Replace SC-408 and SC-408 with Original Hagan Modules

Other documents

EC 402003, Replacement of SC-408C and SC-408 with Original Hagan Modules, Rev. 0

Section 1R20: OutageProcedures

GP-006-1, Normal Plant Shutdown from Power Operation to Hot Shutdown, Rev. 11
 GP-007, Plant Cooldown from Mode 3 to Mode 5, Rev. 102
 OP-201, Residual Heat Removal System, Rev. 71
 OP-603, Electrical Distribution, Rev. 123

Section 1R22: Surveillance TestingProcedures

OMM-015, Operations Surveillance Testing, Rev. 48

Action Requests

1963079, RCS Unidentified Leakage
 1962832, CVC-283B, Charging Pump Relief Valve Leaking By

40A1: Performance Indicator (PI) VerificationProcedures

RNP-M/MECH-1904, RNP NRC Mitigating System Performance Index (MSPI) Basis Document,
 Rev. 002

40A2 Problem Identification and ResolutionProcedures

SPP-031, De-energizing 480 volt Bus E-1 and Station Transformer 2F or 480 Volt Bus E-2 and
 Station Transformer 2G for Maintenance Activities, Rev.16
 MST-E-480-E2-UV, Emergency Bus E2 Undervoltage and Load Shed Test, Rev. 2

40A5: Other ActivitiesProcedures

OWP-039, 'A' Train and 'B' Train Safeguards Logic Maintenance, Rev.4
 SPP-031, De-Energizing 480 volt Bus E-1 and Station Transformer 2F or volt Bus E-2 and
 Station Transformer 2G for Maintenance Activities, Rev. 16
 MST-E-480V-E2-UV, Emergency Bus E2 Undervoltage and Load Shed Test, Rev. 2