



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

April 11, 2018

Ernest J. Kapopoulos, Jr.  
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 PROBLEM IDENTIFICATION  
AND RESOLUTION INSPECTION REPORT 05000261/2018012**

Dear Mr. Kapopoulos:

On March 22, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution biennial inspection at your H.B. Robinson Steam Electric Plant. On that date, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed inspection report.

The NRC inspection team reviewed the station's corrective action program and the station's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the station was complying with NRC regulations and licensee standards for corrective action programs. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

The team also evaluated the station's processes for use of industry and NRC operating experience information and the effectiveness of the station's audits and self-assessments. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

Finally, the team reviewed the station's programs to establish and maintain a safety-conscious work environment, and interviewed station personnel to evaluate the effectiveness of these programs. Based on the team's observations and the results of these interviews, the team found no evidence of challenges to your organization's safety-conscious work environment. Your employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

The NRC inspectors did not identify any finding or violation of more than minor significance.

E. Kapopoulos

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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/*

Randall A. Musser, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

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

Enclosure:  
NRC PI&R IR 05000261/2018012

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AND RESOLUTION INSPECTION REPORT 05000261/2018012 April 11, 2018

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No.: 50-261

License No.: DRP-23

Report No.: 05000261/2018012

Enterprise Identifier: I-2018-012-0009

Licensee: Duke Energy Progress, Inc.

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

Location: 3581 West Entrance Road  
Hartsville, SC 29550

Dates: March 5 through March 22, 2018

Inspectors: R. Taylor, Senior Project Engineer, Team Leader  
A. Beasten, Resident Inspector  
N. Hobbs, Project Engineer  
A. Wilson, Project Engineer

Approved by: R. Musser, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

Enclosure

## **SUMMARY**

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a Biennial Problem Identification and Resolution Inspection at Robinson Nuclear Plant in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

### **List of Findings and Violations**

No findings or violations were identified.

## INSPECTION SCOPE

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards."

## REACTOR SAFETY

### 71152 – Problem Identification and Resolution

The inspectors performed a biennial assessment of the licensee's corrective action program, use of operating experience, self-assessments and audits, and safety conscious work environment. The assessment is documented below.

- (1) Corrective Action Program Effectiveness: Problem Identification, Problem Prioritization and Evaluation, and Corrective Actions – The inspection team reviewed the station's corrective action program and the station's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the station was complying with NRC regulations and licensee standards for corrective action programs.
- (2) Operating Experience and Self-Assessments and Audits – The team evaluated the station's processes for use of industry and NRC operating experience information and the effectiveness of the station's audits and self-assessments.
- (3) Safety Conscious Work Environment - The team reviewed the station's programs to establish and maintain a safety-conscious work environment, and interviewed station personnel to evaluate the effectiveness of these programs.

## INSPECTION RESULTS

Corrective Action Program Effectiveness Observations	71152—Problem Identification and Resolution
<p>Based on the samples reviewed, the team determined that the licensee's corrective action program (CAP) complied with all regulatory requirements and self-imposed standards. The licensee's implementation of the CAP adequately supported nuclear safety.</p> <p>Effectiveness of Problem Identification: The inspectors determined that the licensee was generally effective in identifying problems and entering them into the CAP and there was a low threshold for entering issues into the CAP. This conclusion was based on a review of the requirements for initiating Condition Reports (CRs) as described in licensee procedure AD-PI-ALL-0100, Corrective Action Program, and management's expectation that employees were</p>	

encouraged to initiate CRs for any reason. Additionally, site management was actively involved in the CAP and focused appropriate attention on significant plant issues.

Based on reviews and walkdowns of accessible portions of the selected systems, the inspectors determined that deficiencies were being identified and placed in the CAP.

Effectiveness of Prioritization and Evaluation of Issues: Based on the review of CRs sampled by the inspection team during the onsite period, the inspectors concluded that problems were generally prioritized and evaluated in accordance with the CR significance determination guidance in procedure AD-PI-ALL-0100. The inspectors determined that in general, adequate consideration was given to system or component operability and associated plant risk.

The inspectors determined that plant personnel had conducted root cause and apparent cause analyses in compliance with the licensee's CAP procedures and assigned cause determinations were appropriate, considering the significance of the issues being evaluated. A variety of formal causal-analysis techniques were used to evaluate CRs depending on the type and complexity of the issue consistent with the applicable cause evaluation procedures.

Effectiveness of Corrective Actions: Based on a review of corrective action documents, interviews with licensee staff, and verification of completed corrective actions, the inspectors determined that overall, corrective actions were timely, commensurate with the safety significance of the issues, and effective, in that conditions adverse to quality were corrected. For significant conditions adverse to quality, the corrective actions directly addressed the cause and effectively prevented recurrence. The team reviewed performance indicators, CRs, and effectiveness reviews, as applicable, to verify that the significant conditions adverse to quality had not recurred. Effectiveness reviews for corrective actions to prevent recurrence (CAPRs) were sufficient to ensure corrective actions were properly implemented and were effective.

One observation that the team provided the licensee was that previous revisions of the corrective action program instruction allowed closure of corrective actions to other processes in which the corrective action could be cancelled without consideration for the need of an alternate corrective strategy. For example, CR 664206 was initiated in January 2014 to document the lack of a heater in the starter panel for the C Auxiliary Feedwater Pump diesel, which resulted in the accumulation of condensation and the start of rust. The immediate action of installation of Zerust corrosion inhibitors was taken to temporarily address the undesired condition of condensation and rust. The permanent corrective action of installation of a heater in the panel was issued and eventually closed to the approval of Long Range Plan Funding (LRPF) for the heater installation. This practice of closure of a corrective action to LRPF approval was allowable at the time. That LRPF was later associated with Long Term Action Management (LTAM) RNP-14-0059, which was cancelled by Plant Health Subcommittee in October 2016 as part of an Engineering Excellence Plan initiative to reduce items in the LTAM backlog. As a result, a heater was never installed in the panel and consideration was not given to an alternate corrective action to manage the effects of aging. The licensee captured this observation in Action Request 02192835 to perform an extent of condition on all LTAMs canceled as part of the engineering excellence initiative that are tied to CAP condition reports and evaluate the need to implement alternative corrective actions.

Operating Experience and Self-Assessments and Audits Observations	71152—Problem Identification and Resolution
<p>Based on the samples reviewed, the team determined that station’s processes for the use of industry and NRC operating experience information and for the performance of audits and self-assessments were effective and complied with all regulatory requirements and licensee standards. The implementation of these programs adequately supported nuclear safety. Overall, the team concluded that operating experience was adequately evaluated for applicability and that appropriate actions were implemented to address lessons learned as needed. In general, the inspectors determined that the licensee was effective at performing self-assessments and audits to identify issues at a low level, properly evaluated those issues, and resolved them commensurate with their safety significance.</p>	

Safety Conscious Work Environment Observations	71152—Problem Identification and Resolution
<p>Based on interviews with plant staff and reviews of the latest safety culture survey results to assess the safety conscious work environment on site, the team found no evidence of challenges to safety-conscious work environment. Employees appeared willing to raise nuclear safety concerns through at least one of the several means available.</p>	

**EXIT MEETINGS AND DEBRIEFS**

The inspectors confirmed that proprietary information was controlled to protect from public disclosure. No proprietary information was documented in this report.

- On March 22, 2018, the inspectors presented the Biennial Problem Identification and Resolution inspection results to Mr. Ernest J. Kapopoulos, Jr., and other members of the licensee staff.



## DOCUMENTS REVIEWED

### Procedures

- AD-PI-ALL-0100; Corrective Action Program; Revision 10
- AD-PI-ALL-0200; Performance Trending; Revision 5
- AD-PI-ALL-1000; Conduct of Performance Improvement; Revision 5
- AD-PI-ALL-0101; Root Cause Evaluation; Revision 5
- AD-PI-ALL-0102; Apparent Cause Evaluation; Revision 4
- AD-PI-ALL-0103; Quick Cause Evaluation; Revision 4
- AD-PI-ALL-0104; Prompt Investigation Response Team; Revision 4
- AD-PI-ALL-0105; Effectiveness Reviews; Revision 1
- AD-PI-ALL-0106; Cause Evaluation Checklists; Revision 0
- AD-PI-ALL-0400; Operating Experience Program; Revision 5
- AD-NO-ALL-0202; Employee Concerns Program; Revision 1
- AD-PI-ALL-0300; Self-Assessment and Benchmark Programs; Revision 4
- AD-OP-ALL-0105; Operability Determinations and Functionality Assessments; Revision 4
- AD-OP-ALL-0201; Protected Equipment; Revision 4
- AD-EG-ALL-1210; Maintenance Rule Program; Revision 1
- AD-WC- ALL-0410; Work Activity Integrated Risk Management; Revision 6
- AD-EG-ALL-1204; Single Point Vulnerability Identification, Elimination and Mitigation; Revision 4
- OST-201-1; MDAFW System Component Test -Train "A"; Revision 37
- OST-201-2; MDAFW System Component Test -Train "B", Revision 34

### Condition Reports

- CR 02056554; Reactor Trip as a Result of an Automatic Turbine Trip; 08/24/2016
- CR 02095411; JBX-89 Giving Numerous Tamper Alarms; 01/29/2017
- CR 02102255; SW-PM P-C NW Foundation Bolt, Slight Material Loss; 02/22/2017
- CR 02106632; SW-561 SWBP A Disch Check Valve shows internal corrosion; 03/09/2017
- CR 02170504; SWBP-B Oil Leak Rate Increase; 12/06/2017
- CR 02130303; SW Pump D has Increased Seal Leakage; 06/11/2017
- CR 02050325; 'B' SW pump failed to meet acceptance criteria of OST-302-1; 08/02/2016
- CR 02102540; SW PMP MTR 'C' Lead Box and Cover Misalignment; 02/23/2017
- CR 02086645; NCON for SW-258 will not be resolved this cycle; 12/15/2016
- CR 02063400; Check the problem first - Obtain Vibration Data on SW-PMP-B; 09/20/2016
- CR 02053680; SWBP-A Oil in Oil Cup Visibly Degraded, Seal Casing Hot; 08/15/2016
- CR 02023602; PSL-1616A Service Water Pressure Switch Out of Tolerance; 04/26/2016
- CR 02023604; PI-1616 Service Water Indicator Found Out of Tolerance; 04/26/2016
- CR 02020301; "C" SW Pump vibration data has a rising trend; 04/13/2016
- CR 02060138; CFAM Escalation RNP Eng Technical Task Rigor - PJB/Risk Mgmt; 09/08/2016
- CR 02055272; Trip Block will Stick During Testing; 08/19/2016
- CR 02063623; Model WO instructions are contrary to vendor guidance; 09/21/2016
- CR 02070303; Contingency task instructions not captured in procedures; 10/16/2016
- CR 02056043; Add WO 20105601, Turbine Trip Block Reset Stuck During Testing; 08/23/2016
- CR 02135113; RCP A High Temperature Alarm; 07/05/2017

- CR 02143151; Control Room received APP-001-B3 (RCP " A" Bearing Hi Temp); 08/11/2017
- CR 02160100; "A" RCP motor Upper Thrust Bearing - Indication Issue; 10/23/2017
- CR 02172122; ADD RCP Temperature Indication WOs to R2R31; 12/13/2017
- CR 02164745; Adverse Trend in RCP Indications; 11/10/2017
- CR 02144167; Add WP 20187972 to forced outage/RF0 -31; 08/16/2017
- CR 02140956; PQ-504 (Hi Point Vent Power Supply) found OOT; 08/02/2017
- CR 02175596; R-7 Incore Room No-Link Fail Locked In; 01/08/2018
- CR 02162583; TE-129 (RCP B Seal Leak Off Temp.) Indication; 11/02/2017
- CR 02178824; N-51 Wide Range % Power and Source Range Indication; 01/22/2018
- CR 02182366; Cognitive Trend in N51/N52 Power Supply Failures; 02/05/2018
- CR 02180925; Unplanned LCO entry due to N-51 power supply; 01/30/2018
- CR 01993790; Blockage in the Service Water Return Line for MDAFW Pump B; 01/21/2016
- CR 01993873; "A" MDAFW Pump declared inoperable due to low service water; 01/22/2016
- CR 01993881; SW-563, AFW Cooler return check valve inoperable; 01/22/2016
- CR 01995930; Configuration Control issue with SW Pipe Connections; 01/28/2016
- CR 01998012; SW Valves with PQL (0) installed on Safety Related Equipment; 02/04/2016
- CR 01998030; Lunkenheimer SW-115 not evaluated prior to installation; 02/04/2016
- CR 02192835; 2018 PIR: Alternate Actions Not Considered When LTAM Cancel; 03/20/2018
- CR 02107257; RV SI-857B Passed Initial Setpoint Test, Failed As-Left; 03/12/2017
- CR 02129421; RWST Inleakage; 06/06/2017
- CR 02021641; NOS Identified: B SI Pump Surveillance and ISI Pressure Test; 04/19/2016
- CR 02078724; SI Accumulator Level Surveillance Indicator Uncertainty; 11/14/2016
- CR 02167915; Oil Seep "C" SI Pump I/B Bearing; 11/28/2017
- CR 02120908; Investigate/Repair Nitrogen Leak 'C' SI Accumulator; 05/02/2017
- CR 02134355; Replace SI-857A; 6/29/2017
- CR 02041483; 52/MCC-4(3J) Reset Mechanism Found Defective & Repaired; 06/28/2016
- CR 02058523; Degraded Cable Insulation Found on RHR "A" Motor; 09/01/2016
- CR 02122865; Maintenance Rule (a)(3) Periodic Assessment; 05/09/2017
- CR 0621411; Service Water Pipe to Turbine Lube Oil Cooler; 08/08/2013
- CR 0634867; DG-A-Engine Degraded Jacket Water Piping; 10/13/2013
- CR 0664206; Rusting Components in the AFW Pump "C" Starter Panel; 01/22/2014
- CR 0634820; CCW "A" HTX Has Cracked/Missing Nut; 10/12/2013
- CR 02180160; Repair Response of Charging Pump Speed Controller; 01/26/2018
- CR 02152182; Misposition of IA-3898 Charging Pump C Backup Air Test; 09/20/2017
- CR 02151853; Check DS Conduit Box on Control Room Patio; 09/19/2017
- CR 02131028; RCS Leakage Rate Trending Upwards; 06/14/2017
- CR 02125000; Damaged Journal Bearings in CHG-PMP-C; 05/16/2017
- CR 02182015; AOP-003, RCS Makeup Malfunction Entry; 02/05/2018
- CR 02138493; No Boric Acid Flow While Borating; 07/21/2017
- CR 02063189; "C" Charging Pump Would Not Rotate; 09/20/2016
- CR 02127151; LI-108 Failed High (B BAST); 05/25/2017
- CR 02107684; FCV-605 Will Not Open; 08/25/2016
- CR 02031074; Unplanned LCO Entry; 05/19/2016

- CR 02057190; Repair "A" RHR Pump Seal; 08/28/2016
- CR 02108650; Repair R-7 Monitor After Internal Source Check Failure; 03/15/2017
- CR 02035500; LR Tainter Gate Full Travel Test; 06/06/2016
- CR 02043826; East Tainter Gate Chains Binding
- CR 02155050; 2017 RNP EQ DBAIP Error in Qualified Life Calculation; 10/02/2017
- CR 02158467; 2017 RNP EQ DAAI(P) HVH-8A-MTR and HVH-8B-MTR; 10/16/2017
- CR 01997952; HVE-2A, HVE-2B, HVE-5A, and HVE-5B S.R. Classification; 02/03/2016
- CR 01991686; Instrument Air to Containment Isolated; 01/16/2016
- CR 02193236; 2018 PI&R; Minor Oxidation on AFW Pump "C" Cntrl Pwr Xfmer; 03/21/2018
- CR 2186760; Radiation Monitors Classified Maint Rule (a)(1); 02/22/2018
- CR 2186971; R-11 COUNTS CYCLICAL-CV AND PLANT VENT AIR PARTICULATE MONIT; 02/23/2018
- CR 2185416; R-11 Spike Secured CV Press Relief; 02/17/2018
- CR 2186041; R-14 Sample Pump failed; 02/20/2018
- CR 2184221; Unplanned LCO entry due to R-11 elevated counts; 02/13/2018
- CR 2143020; ADVERSE TREND WITH RESPECT TO RADIATION MONITORS; 08/10/2017
- CR 2091218; unplanned LCO entry; 01/11/2017
- CR 2147562; Rad Monitors Losing Communications during OST-924-1; 08/30/2017
- CR 2100152; Unanticipated trip of the primary air compressor; 02/15/2017
- CR 2167197; A-IAC NOT MAINTAINING IA PRESSURE WITH DRYER BYPASSED ; 11/21/2017
- CR 2184119; IAC- D HAS TRIPPED ON MOTOR OVERLOAD; 02/12/2018
- CR 2005141; OMM-021 deficiencies; 03/02/2016
- CR 2062735; 2016 CDBI: R-32A and R-32B Operability Determination; 09/19/2016
- CR 2052758; 2016 CDBI: IN 97-45 Response; 08/10/2016
- CR 2109909; IN 2014-07 Incomplete Resolution; 03/21/2017
- CR 2162081; RNP-M/MECH-1792 Calc has high CV Sump/Spray pH vs EQ maps; 10/31/2017
- CR 2163569; Spray Additive Tank NaOH% misentry in NuclearIQ; 11/07/2017
- CR 2012658; MSLB Unanalyzed Condition; 03/21/2016
- CR 2020495; MSLB single failure case MFWIV failure to close; 04/14/2016
- CR 2018710; Incorrect response to NRC IE bulletin 80-04.; 04/07/2016
- CR 2024743; Operating Experience Regarding Complications from a Loss of Instrument Air; 04/07/2016
- CR 2134544; Anchor/Darling Double Disc Gate Valve Wedge Pin and Stem-Disc Separation Failures; 06/15/2017
- CR 2175374; RP surveillance not perform IAW procedural requirement; 01/05/2018
- CR 2108188; Worker Exited site without follow-up Whole Body Count; 03/15/2017
- CR 2100120; RP Techs source checked instrument out of calibration; 02/14/2017
- CR 2185717; "A" BAST Boron above Administrative Limit; 02/19/2018
- CR 2182797; Decrease in FW Hydrazine Concentration; 02/07/2018
- CR 2143873; Environmental Air Monitors calibrated without required flow; 08/15/2017
- CR 2094647; No communication regarding Zinc inj tank below admin limit; 03/05/2018
- CR 2184325; Priority level set by the TSC does not align with OSC; 02/13/2018
- CR 2154028; Environmental Monitoring Team Portable Generator Missing; 09/17/2017
- CR 2085665; NOS ID: SFP Level Indicator Design Control; 12/12/2016
- CR 2039684; 2016 NRC Emergency Preparedness Inspection; 06/21/2016
- 14 Security-related CRs were reviewed during the inspection

### Work Orders

- WO 20228285
- WO 20217543
- WO 20223673
- WO 20181019
- WO 20187972
- WO 20209386
- WO 20196277
- WO 20025029
- WO 20037971
- WO 20140909
- WO 20051516
- WO 20060103
- WO 20060104
- WO 20063292
- WO 20063296
- WO 20063301
- WO 20063304
- WO 13352372
- WO 11984154
- WO 20153173

### Other

- Rad Monitor System Health; 2017 Q2
- Instrument Air System Health; 2017 Q2
- Operations Training Radiation Monitoring System; SD-019, Revision 08; 06/25/2008
- Operations Training Instrument and Service Air System; SD-017, Revision 12; 01/27/2009
- Maintenance Rule System (a)(1) Action Plan; System 7005 Rad; 03/07/2018
- EC 406551; SYSTEM 4045 Maintenance Rule Quality, and Equipment Reliability Evaluation for the Tainter Gates; Revision 0; 11/22/2016
- LRPF 676999; 05/29/2014
- LTAM RNP-14-0059; Install Heater in 'C' AFW Pump Starter Panel; 05/01/2014
- DBD/R87038/SD02, SYS DBD Safety Injection System, Revision 21
- Safety Injection System Health Report, dated January 30, 2018