



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II**

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

October 25, 2017

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 – NUCLEAR REGULATORY
COMMISSION INTEGRATED INSPECTION REPORT 05000261/2017003**

Dear Mr. Kapopoulos:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your H. B. Robinson Steam Electric Plant, Unit 2. On October 25, 2017, the NRC inspectors discussed the results of this inspection with you and members of your staff. The results of this inspection are documented in the enclosed report.

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

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, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000261/2017003
w/Attachment: Supplemental Information

cc Distribution via ListServ

E. Kapopoulos, Jr.

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SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT – NUCLEAR REGULATORY
COMMISSION INTEGRATED INSPECTION REPORT 05000261/2017003
October 25, 2017

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-261

License Nos.: DPR-23

Report No.: 05000261/2017003

Licensee: Duke Energy Progress, LLC

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

Location: 3581 West Entrance Road
Hartsville, SC 29550

Dates: July 1, 2017 through September 30, 2017

Inspectors: J. Rotton, Senior Resident Inspector
G. Eatmon, Acting Senior Resident Inspector
A. Beasten, Resident Inspector
D. Jackson, Project Engineer (Section 1R04)
A. Alen, Vogtle Resident Inspector (Section 1R22)

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

Enclosure

SUMMARY

Integrated Inspection Report 05000261/2017003, July 1, 2017, through September 30, 2017; Duke Energy Progress, LLC, H. B. Robinson Steam Electric Plant, Unit 2, Integrated Inspection Report.

The report covered a 3-month period of inspection by resident inspectors and two visiting 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 6.

REPORT DETAILS

Summary of Plant Status

The unit began the inspection period at essentially 100 percent power and remained there for the duration of the quarter.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

a. Inspection Scope

Impending Adverse Weather Conditions

The inspectors reviewed the licensee's preparations to protect risk-significant systems from potential hurricane conditions expected during September 8-11, 2017. 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 potential hurricane 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.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04 – 4 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:

- 'B' containment spray pump while 'A' containment spray pump was out of service for pump alignment

- 'B' emergency diesel generator (EDG) starting air following the 'B' EDG monthly slow speed start
- 'A' service water booster pump (SWBP) while 'B' SWBP was out of service for planned maintenance

.2 Complete Walkdown

The inspectors verified the alignment of the component cooling water 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 updated final safety analysis report, 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 (WOs). 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 five fire areas to assess material condition and operational status of fire protection equipment. Documents reviewed are listed in the attachment.

- Auxiliary Building Hallway – Central, fire zone 7
- 'A' EDG room, fire zone 2
- Unit 2 cable spread room, fire zone 19
- Rod control room, fire zone 21
- Safety injection pump room, fire zone 3

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, 2017, 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 stuck open pressurizer spray valve followed by two faulted steam generators outside of containment.

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

On July 21, 2017, the inspectors observed licensed operator performance in the main control room during licensee procedure AOP-003, Malfunction of Reactor Makeup Control.

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 – 2 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.

- Nuclear condition report (NCR) 02134763, 'A' CV Spray Pump binding during alignment
- NCR 02144775, 4kV Bus 2 underfrequency trip relay failure

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 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.

- July 3-5, 2017, Green risk for emergent work due to issues on containment spray pump 'A' maintenance
- August 7-10, 2017, Green risk for emergent transmission work due to a lightning strike that caused a loss of both auto transformers and multiple sources of 115kV offsite power
- September 14-15, 2017, Emergent green risk for blown steam dump fuses during MST-020
- August 18, 2017, Emergent green risk for 4kV Bus 2 underfrequency trip relay failure and RPS half-trip actuation
- September 13, 2017, Green risk for steam driven auxiliary feedwater (AFW) pump routine maintenance

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 samples)

a. Inspection Scope

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 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 technical specification 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.

- NCR 02134816, 'B' SWBP oil level lowering and NCR 02151341, Oil level is dropping in the bubbler for the 'B' SWBP
- NCR 02153161, HVE-17 Damper for 'B' EDG Room not fully closed
- NCR 02134817, 'C' Main transformer oil pumps and fans failure
- NCR 02142653, 'A' and 'B' motor driven AFW pumps flow control valve handwheel locking chain interference with seismic restraints
- NCR02142731, Scaffold in contact with 'A' containment spray pump piping

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 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 20183706, Charging pump 'A' middle plunger oil leak
- WO 20106048, Contingency task for low margin on containment spray pump 'A' during OST-352-1
- WO 20196752, Bank 1 steam dump loss of indication
- WO 20058597, Dedicated shutdown diesel generator maintenance outage
- WOs 20157252, 200773946, 12220027, steam driven AFW pump routine maintenance outage
- WO 20193761, 4kV Bus 2 underfrequency relay failure replacement

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.

1R22 Surveillance Testing (71111.22 – 6 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 technical specifications) 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

- OST-401-2, EDG 'B' Slow Speed Start
- OST-409-1, EDG 'A' Fast Speed Start
- OST-948, Dedicated Shutdown Diesel Generator Auto-start
- OWP-011, Nuclear Instrumentation, and PIC-112, Axial Power Distribution Calibration

In-Service Tests (IST)

- OST-908-2, Component Cooling Water Pump A Test

Reactor Coolant System Leak Detection

- OST-051, Reactor Coolant System Leakage Evaluation

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

a. Inspection Scope

The inspectors observed the emergency preparedness drill conducted on July 11, 2017. The inspectors observed licensee activities in the simulator and/or technical support center to evaluate implementation of the emergency plan, including event classification, notification, and protective action recommendations. The inspectors evaluated the licensee's performance against criteria established in the licensee's procedures. Additionally, the inspectors attended 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.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 5 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, 2016 and March 31, 2017 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 power changes per 7000 critical hours

Cornerstone: Mitigating Systems

- emergency ac power system
- heat removal system

Cornerstone: Barrier Integrity

- reactor coolant system specific activity

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 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 the following two condition reports:

- NCR 02138493, No Boric Acid Flow while Borating
- NCR 02134817, Pumps and Fans Failed on C Main Transformer

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.

4OA6 Meetings, Including Exit

On October 25, 2017, the resident inspectors presented the inspection results to Mr. Kapopoulos 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.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

F. Giannone, Training Manager
T. Giese, Manager, Operations Training
D. Hall, Nuclear Oversight Manager
S. Hall, Acting Radiation Protection Superintendent
G. Hartzer, Chemistry Manager
D. Hoffman, Manager, Operations
J. Kammer, General Manager, Engineering
E. Kapopoulos, Site Vice President
T. Kirwin, Manager, Maintenance
J. Krakuszeski, Plant General Manager
C. Orr, Manager, Nuclear Work Management
T. Pilo, Regulatory Affairs Manager
D. Pitsley, Manager, Emergency Preparedness
C. Sherman, Organizational Effectiveness Director
J. Wild, Regulatory Affairs

NRC personnel

J. Rotton, Senior Resident Inspector
A. Beaten, Resident Inspector
S. Rose, Branch Chief, Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Seasonal Extreme Weather Conditions

AD-WC-ALL-0230, Seasonal Readiness

AP-053, Severe Weather Response

OMM-021, Operation During Adverse Weather Conditions

Section 1R04: Equipment Alignment

Partial Walkdown

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

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

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

Drawing G-190204-A, Emergency Diesel Generator System Flow Diagram, Sheet 1, Rev. 39

Drawing G-190199, Service and Cooling Water System Flow Diagram, Sheet 7, Rev. 40

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

Complete Walkdown

Drawing 5379-376, Component Cooling Water System Flow Diagram, Sheet 1, Rev. 44;
Sheet 2, Rev. 34; Sheet 3, Rev. 28; Sheet 4, Rev. 36

Section 1R05: Fire Protection

AD-EG-ALL-1520, Transient Combustible Control

OMM-002, Fire Protection Manual

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

OMM-020, Fire Protection List

AOP-041, Response to the Fire Event

AD-EG-ALL-1522, Duties of a Fire Watch

OST-625, Fire Door Inspections

HBR2-11937, Fire Pre-Plan A Diesel Generator Room, Sheet 10

HBR2-11937, Fire Pre-Plan Auxiliary Building Hallway- Central, Sheet 2

HBR2-11937, Fire Pre-Plan Unit 2 Cable Spread Room, Sheet 29

HBR2-11937, Fire Pre-Plan Rod Control Room, Sheet 31

HBR2-11937, Fire Pre-Plan Safety Injection Room, Sheet 19

Section 1R11: Licensed Operator Regualification Program and Licensed Operator Performance

Resident Inspector Quarterly Review of Licensed Operator Regualification

AOP-019, Malfunction of RCS Pressure Control

EOP-E-0, Reactor Trip or Safety Injection, Rev. 8

EOP-E-2, Faulted Steam Generator Isolation, Rev. 4

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

AD-OP-ALL-1000, Conduct of Operations

AD-OP-ALL-0203, Reactivity Management

AOP-003, Malfunction of Reactor Makeup Control

Section 1R12: Maintenance Effectiveness

AD-EG-ALL-1210, Maintenance Rule Program

NCR 02135009, 'A' CV Spray Pump troubleshooting

NCR 02134846, Preparations for CV-Spray-Pmp-A activities
 NCR 00302718, CV-Spray-PMP-B binding while hand turning, OP-202
 NCR 02144775, 4KV Bus 2 underfrequency trip relay failure
 WO 20193761, 4KV Bus 2 underfrequency relay replacement and post maintenance testing

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

AD-WC-ALL-0200, On-Line Work Management
 AD-OP-ALL-0201, Protected Equipment
 OMM-48, Work Coordination and Risk Assessment
 AD-WC-ALL-0410, Work Activity Integrated Risk Management
 AD-NF-ALL-0501, Electronic Risk Assessment Tool (ERAT)
 NCR 02142216, Temporary loss of Power/Lightning Strike
 NCR 02142744, #1 Autobank Transformer Tripped due to Grid Through Fault
 NCR 02142748, #2 Autobank Transformer Tripped due to Grid Through Fault
 NCR 02141891, Unplanned Trip of Switchyard Breaker – Florence 115kV Line
 NCR 02144775, 4KV Bus 2 underfrequency trip relay failure

Section 1R15: Operability Determinations and Functionality Assessments

Operability and Functionality Review

AD-OP-ALL-0102, Operational Decision Making
 AD-OP-ALL-0105, Operability Determination and Functionality Assessments
 RNP-M/MECH-1892, System Mission Times
 RNP-M/MECH-1708, Evaluation of NFPA 12 Code Compliance Variances
 NCR 02084329, HVE-17 Discharge damper blades not fully closed
 WO 20129912, HVE-17 Discharge damper blades not fully closed

Section 1R19: Post Maintenance Testing

PLP-033, Post Maintenance Testing Program
 OST-101-1, CVCS Component Test Charging Pump 'A'
 NCR 02137420, Charging pump 'A' middle plunger oil leak
 OST-352-1, Containment spray component test – Train A
 OST 352-3, Comprehensive flow test for containment spray pump A
 NCR 02147971, Bank 1 steam dump loss of indication
 MST-020, Reactor protection logic train 'A' at power
 PIC-806, Westinghouse Type KF underfrequency relay
 OST-910, Dedicated Shutdown Diesel Generator Monthly
 OP-602, Dedicated Shutdown System
 OST-948, Auto-Start of the Dedicated Shutdown Diesel Generator
 OST-202, Steam Driven Auxiliary Feedwater Pump System Component Test

Section 1R22: Surveillance Testing

OMM-015, Operations Surveillance Testing

Section 4OA1: Performance Indicator Verification

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

Section 4OA2: Problem Identification and Resolution

AD-PI-ALL-0100, Corrective Action Program
 AD-PI-ALL-0101, Root Cause Evaluation
 AD-PI-ALL-0102, Apparent Cause Evaluation

AD-PI-ALL-0103, Quick Cause Evaluation
AD-PI-ALL-0104, Prompt Investigation Response Team
AD-LS-ALL-0006, Notification/Reportability Evaluation
AD-EG-ALL-1311, Failure Investigation Process (FIP)