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10 CFR 50.73

Serial: RNP-RA/15-0072  
AUG 26 2015

United States Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261/RENEWED LICENSE NO. DPR-23

LICENSEE EVENT REPORT NO. 2015-004-00:  
REFUELING WATER STORAGE TANK (RWST) DISCHARGE VALVE FAILED TO CLOSE ON  
DEMAND

Ladies and Gentlemen:

Pursuant to 10 CFR 50.73, Duke Energy Progress, Inc. is submitting the attached Licensee Event Report. Corrective actions were completed that have restored compliance with NRC regulations. Should you have any questions regarding this matter, please contact Mr. R. Hightower, Manager – Nuclear Regulatory Affairs at (843) 857-1329.

This document contains no new regulatory commitments.

Sincerely,

R. Michael Glover  
Site Vice President

RMG/jmw

Attachment

c: V. McCree, NRC, Region II  
NRC Resident Inspector, HBRSEP  
M. Barillas, NRR

**H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2**

**REFUELING WATER STORAGE TANK (RWST) DISCHARGE VALVE FAILED TO  
CLOSE ON DEMAND**

**LICENSEE EVENT REPORT (LER)**(See Page 2 for required number of  
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [Infocollections.Resource@nrc.gov](mailto:Infocollections.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

**1. FACILITY NAME**

H. B. Robinson Steam Electric Plant, Unit No. 2

**2. DOCKET NUMBER**

05000 261

**3. PAGE**

1 OF 3

**4. TITLE**

Refueling Water Storage Tank (RWST) Discharge Valve Failed To Close On Demand

| 5. EVENT DATE            |     |  | 6. LER NUMBER |                   |   | 7. REPORT DATE |     |   | 8. OTHER FACILITIES INVOLVED |               |   |  |  |
|--------------------------|-----|--|---------------|-------------------|---|----------------|-----|---|------------------------------|---------------|---|--|--|
| MONTH                    | DAY | YEAR   | YEAR          | SEQUENTIAL NUMBER | REV NO  | MONTH          | DAY | YEAR  | FACILITY NAME                | DOCKET NUMBER |   |  |  |
| 05                       | 18  | 2015   | 2015          | 004               | 00  | 08             | 27  | 2015  | FACILITY NAME                | DOCKET NUMBER |   |  |  |
|                          |     |  |               |                   |   |                |     |   |                              | 05000         |   |  |  |
|                          |     |  |               |                   |   |                |     |   |                              | 05000         |   |  |  |
| <b>9. OPERATING MODE</b> |     | <b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b> |               |                   |   |                |     |   |                              |               |   |  |  |
| 6                        |     | <input type="checkbox"/> 20.2201(b)  |               |                   | <input type="checkbox"/> 20.2203(a)(3)(i)             |                |     | <input type="checkbox"/> 50.73(a)(2)(i)(C)  |                              |               | <input type="checkbox"/> 50.73(a)(2)(vii)     |  |  |
|                          |     | <input type="checkbox"/> 20.2201(d)  |               |                   | <input type="checkbox"/> 20.2203(a)(3)(ii)            |                |     | <input type="checkbox"/> 50.73(a)(2)(ii)(A) |                              |               | <input type="checkbox"/> 50.73(a)(2)(viii)(A) |  |  |
|                          |     | <input type="checkbox"/> 20.2203(a)(1)   |               |                   | <input type="checkbox"/> 20.2203(a)(4)                |                |     | <input type="checkbox"/> 50.73(a)(2)(ii)(B) |                              |               | <input type="checkbox"/> 50.73(a)(2)(viii)(B) |  |  |
|                          |     | <input type="checkbox"/> 20.2203(a)(2)(i)  |               |                   | <input type="checkbox"/> 50.36(c)(1)(i)(A)            |                |     | <input type="checkbox"/> 50.73(a)(2)(iii)   |                              |               | <input type="checkbox"/> 50.73(a)(2)(ix)(A)   |  |  |
| 10. POWER LEVEL          |     | <input type="checkbox"/> 20.2203(a)(2)(ii)   |               |                   | <input type="checkbox"/> 50.36(c)(1)(ii)(A)           |                |     | <input type="checkbox"/> 50.73(a)(2)(iv)(A) |                              |               | <input type="checkbox"/> 50.73(a)(2)(x)       |  |  |
|                          |     | <input type="checkbox"/> 20.2203(a)(2)(iii)  |               |                   | <input type="checkbox"/> 50.36(c)(2)                  |                |     | <input type="checkbox"/> 50.73(a)(2)(v)(A)  |                              |               | <input type="checkbox"/> 73.71(a)(4)          |  |  |
|                          |     | <input type="checkbox"/> 20.2203(a)(2)(iv)   |               |                   | <input type="checkbox"/> 50.46(a)(3)(ii)              |                |     | <input type="checkbox"/> 50.73(a)(2)(v)(B)  |                              |               | <input type="checkbox"/> 73.71(a)(5)          |  |  |
|                          |     | <input type="checkbox"/> 20.2203(a)(2)(v)  |               |                   | <input type="checkbox"/> 50.73(a)(2)(i)(A)            |                |     | <input type="checkbox"/> 50.73(a)(2)(v)(C)  |                              |               | <input type="checkbox"/> OTHER                |  |  |
|                          |     | <input type="checkbox"/> 20.2203(a)(2)(vi)   |               |                   | <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) |                |     | <input type="checkbox"/> 50.73(a)(2)(v)(D)  |                              |               | Specify in Abstract below or in NRC Form 366A |  |  |

**12. LICENSEE CONTACT FOR THIS LER**

## LICENSEE CONTACT

W. R. Hightower - Manager, Nuclear Regulatory Affairs

## TELEPHONE NUMBER (Include Area Code)

(843) 857-1329

**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

| CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX |
|-------|--------|-----------|---------------|--------------------|-------|--------|-----------|---------------|--------------------|
| X     | BQ     | RLY       | W121          | Y                  |       |        |           |               |                    |

**14. SUPPLEMENTAL REPORT EXPECTED**☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

| MONTH | DAY | YEAR |
|-------|-----|------|
|       |     |      |

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)**

At 2311 hours EDT on 05/18/2015 with H. B. Robinson Steam Electric Plant, Unit No. 2 in Mode 6 at zero percent power, the Refueling Water Storage Tank discharge valve (SI-864A) failed to stroke closed on demand from the Reactor Turbine Gauge Board (RTGB) during surveillance testing of Emergency Core Cooling System (ECCS) boundary valves. Troubleshooting revealed the thermal overload relay within the breaker that supplies power to SI-864A was tripped with the breaker closed. In this condition, SI-864A would not have stroked closed on demand from the RTGB as designed, rendering the 'A' ECCS train inoperable. The approximate time and cause of the tripped relay is unknown at present; an investigation is ongoing.

Technical Specification (TS) 3.5.2, ECCS - Operating, requires two ECCS trains operable in Modes 1, 2, and 3, allowing 72 hours to return the inoperable ECCS train to service. The latest satisfactory stroke of SI-864A was on 3/26/14. Since the trip time of the overload relay is unknown, it must be assumed that the valve was inoperable for a period greater than that allowed by TS. Therefore, this circumstance is reportable as a condition prohibited by TS under 10 CFR 50.73(a)(2)(i)(B).

The investigation into the cause of the tripped overload relay is ongoing, and should the results of the investigation yield a definite cause, a follow-up report will be submitted. The thermal overload relay and associated push-button on MCC-5(10J) were replaced during RO29. The health and safety of the public was not in jeopardy as a result of this condition.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

| 1. FACILITY NAME                                | 2. DOCKET | 6. LER NUMBER |                      |             | 3. PAGE |
|---|-----------|---------------|----------------------|-------------|---------|
|   |           | YEAR          | SEQUENTIAL<br>NUMBER | REV/<br>NO. |         |
| H. B. Robinson Steam Electric Plant, Unit No. 2 | 05000 261 | 2015          | - 004                | - 00        | 2 OF 3  |

**NARRATIVE****PLANT IDENTIFICATION**

Westinghouse Pressurized Water Reactor

**BACKGROUND**

Technical Specification (TS) 3.5.2, (Emergency Core Cooling System) ECCS[BQ] - Operating, requires two ECCS trains be operable in MODES 1, 2, and 3. If one or more trains are inoperable, the licensee must enter Condition A - restore the inoperable train(s) to operable status within 72 hours. If this completion time is not met, Condition C is entered - be in MODE 3 within 6 hours AND be in MODE 4 within 12 hours. Since the Completion Times for the Required Actions of Conditions A and C were exceeded, this event is reportable as a condition prohibited by TS under 10 CFR 50.73(a)(2)(i)(B). The regulatory impact to the station as a consequence of this exceedance necessitates a 60-day licensee event report (LER) to the NRC under 10 CFR 50.73(a)(2)(i)(B), "Operation or Condition Prohibited by Technical Specifications."

**EVENT DESCRIPTION**

At 2311 hours EST on 5/18/2015, with the plant in Mode 6 and zero percent power and no involvement of out-of-service structures, systems or components, the Refueling Water Storage Tank (RWST)[TK] discharge motor-operated valve [20](MOV) (SI-864A) failed to stroke closed on demand from the Reactor Turbine Gauge Board (RTGB) [MCBD] during Engineering Surveillance Test (EST)-140, Leak Test for ECCS Boundary Valves [ISV]. Troubleshooting found the thermal overload relay [RLY] on motor control center [MCC]-5 breaker (10J) [BKR] was tripped, and the external reset push-button [HS] on the MCC-5 door [DR] was missing. As a result, it was necessary to open the MCC-5 cubicle door to reset the tripped relay. While resetting, the reset lever did not spring back to its normal position as expected, and was manually pulled back into the reset position. Once the thermal overload relay was reset, EST-140 was resumed and the valve operated successfully. The malfunctioning relay and reset push-button were subsequently replaced and the former sent for testing to determine the cause of the trip.

The failure of SI-864A to stroke on demand was documented in condition report (CR) 749789 and a reportability evaluation was performed on 6/15/15. This evaluation concluded that the failure of SI-864A was not reportable. This conclusion was later challenged by Duke Energy Oversight personnel and has since been re-evaluated as reportable as a condition prohibited by TS 3.5.2, ECCS - Operating, based on the best available information indicating that the overload relay was tripped prior to beginning EST-140 on 5/18/2015. On 7/22/15, the General Manager of Engineering initiated CR 760178 to document the incorrect conclusion. As a consequence of this re-evaluation, the 60-day reporting requirement was exceeded.

**CAUSAL FACTORS**

The exact cause of the thermal overload relay trip on breaker MCC-5(10J) is unknown at present. However, the relay was tested and was within the required tolerance for the "as-found" condition. Additionally, the RWST was full, eliminating any excess current demand that would result from a "dry" stroking condition related to the RWST being drained at the time of valve testing. Physical evidence at the breaker cubicle, which includes the location of the breaker in the lower section of MCC-5, high traffic in the area during the refueling outage (RO29), and missing external reset push-button, suggests that the cubicle may have been disturbed (bumped). Forensic testing of the relay also indicates the relay may have tripped due to mechanical shock when something dislocated the reset push-button from the MCC-5(10J) door, likely damaging the relay's reset mechanism. However, since there is no firm evidence to support a time frame for this cause, it must be assumed that the relay has been tripped for a period greater than that allowed by TS. With the relay tripped, SI-864A would not have functioned as designed.

The investigation related to the cause of the tripped thermal overload relay is ongoing, with destructive forensic testing results of the relay pending. Should the results of this testing indicate a definite cause, a follow-up report will be submitted.

LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET

| 1. FACILITY NAME                                | 2. DOCKET | 6. LER NUMBER |                      |            | 3. PAGE |
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## NARRATIVE

## CORRECTIVE ACTIONS

Corrective actions taken to restore compliance with regulations are listed below.

## Immediate:

1. CR 749789 generated to capture event in Corrective Action Program
2. Troubleshooting MCC-5(10J) thermal overload relay trip (WO 13524604-01)

## Completed:

1. Non-destructive forensic testing of MCC-5(10J) thermal overload relay
2. CR 760178 generated to capture reportability evaluation error in Corrective Action Program
3. Thermal overload relay and external reset push-button replaced (WO 13524604-02)

## Planned:

1. Destructive forensic testing of MCC-5(10J) thermal overload relay

## SAFETY ANALYSIS

The consequence of the failure of the RWST discharge valve SI-864A to close on demand is of very low safety significance. The risk consequences of this event are reduced as the failure of valve SI-864A to close on demand is mitigated by the presence of a second RWST discharge valve in series, SI-864B. The primary event in which the valves would be required to perform on demand is when a loss of reactor coolant inventory occurs and the plant is required to isolate the RWST to perform recirculation from the sump. There is no indication that SI-864B would also fail to close upon demand. Failure of SI-864A is important when SI-864B also fails to close and when recirculation from the sump is needed.

Another factor contributing to the low safety significance of the SI-864A failure is that the operator sent to investigate the valve would check the breaker and attempt a reset, which would have cleared the thermal overload relay, thus restoring the auto functions to SI-864A.

## ADDITIONAL INFORMATION

A search for previous similar events at HBRSEP2 was conducted within the past three years. In October 2013, the MOV team stroked the SI-864A valve from closed to open and subsequently from open to closed and the valve did not move. Investigation found that the thermal overload relay was tripped, and was manually reset of the relay was performed. Troubleshooting revealed that the valve demanded greater than 150% of the required stroking current, tripping the thermal overload relay. This increased current demand was the result of the increased load on the valve due to the "dry" stroking condition resulting from the RWST being drained at the time of valve testing. This event differs in that the RWST was not drained, thus no dry stroking condition was present.

Energy Industry Identification System (EIIS) codes for systems and components relevant to this event are identified in the text of this document within brackets [ ].