



**Steve Snider**  
Vice President

**Nuclear Engineering**  
526 South Church Street, EC-07H  
Charlotte, NC 28202  
980-382-6195  
Steve.Snider@duke-energy.com

Serial: RA-19-0393  
March 8, 2021

10 CFR 50.55a

U.S. 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

**SUBJECT: H. B. Robinson Steam Electric Plant Unit No. 2, Refuel 32 (R2R32) Inservice Inspection Program Ninety Day Owner's Activity Report**

Ladies and Gentlemen:

Pursuant to the reporting requirements of American Society of Mechanical Engineers (ASME) Section XI, as amended by ASME Code Case N-532-5, Duke Energy Progress (Duke Energy) hereby submits the Owner's Activity Report for the H. B. Robinson Nuclear Plant Unit No. 2 (RNP) outage R2R32.

No new regulatory commitments have been made in this submittal. If you have additional questions, please contact Mr. Art Zaremba, Manager – Regulatory Affairs, at 980-373-2062.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Snider", written in a cursive style.

Steve Snider  
Vice President – Nuclear Engineering

Enclosures:

1. Ninety Day Owner's Activity Report for Refueling Outage 32

cc:

L. Dudes, Regional Administrator USNRC Region II  
T. Hood, NRC Project Manager, NRR  
J. Klos, NRC Project Manager, NRR  
M. Fannon, NRC Senior Resident Inspector

Enclosure 1  
RA-19-0393

**Enclosure 1**  
**Ninety Day Owner's Activity Report for Refueling Outage 32**

**FORM OAR-1 OWNER'S ACTIVITY REPORT**

Report Number: RA-19-0393 Plant: H.B. Robinson Steam Electric Plant, 3581 West Entrance Road Hartsville, SC 29550

Unit No.: 2 Commercial Service Date: March 7, 1971 Refueling Outage No.: R2R32

Current Inspection Interval: Fifth Interval (ISI), Third Interval (CISI) Current Inspection Period: Third Period (ISI), Second Period (CISI)

Edition and Addenda of Section XI Applicable to the Inspection Plans: 2007 Edition through 2008 Addenda (ISI), 2013 Edition (CISI)

Date and Revision of Inspection Plans: See the table in Attachment 1.

Edition and Addenda of Section XI Applicable to Repair/Replacement Program, if Different than the Inspection Plans: same as above

Code Cases Used: N-432-1, N-508-4, N-513-3, N-516-3, N-526, N-532-5, N-586-1, N-597-2, N-600, N-613-1, N-629, N-639, N-641, N-643-2, N-648-1, N-651, N-660, N-663, N-705, N-706-1, N-716-1, N-722-1, N-729-4, N-731, N-735, N-762, N-770-5

**Certificate of Conformance ISI Inspections**

I certify that (a) the statements made in this report are correct; and (b) the examinations and tests meet the Inspection Plan as required by the ASME Code, Section XI; and the completion of R2R32 conform to the requirements of Section XI.

Signed Angela Staller Digitally signed by E50268 (342024) Date: 2021.03.02 07:30:04 -05'00' Angela Staller, ISI Program Manager Date 3/2/2021  
Owner or Owner's Designee, Title

**Certificate of Conformance ISI Repair/Replacement**

I certify that (a) the statements made in this report are correct; and (b) the repair/replacement activities and evaluations supporting the completion of R2R32 conform to the requirements of Section XI.

Signed Ben Babb Ben Babb, Repair/Replacement PM Date 2/25/21  
Owner or Owner's Designee, Title

**Certificate of Inservice Inspection**

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of South Carolina and employed by OneCIS Insurance Company of Lynn, MA. have inspected the items described in this Owner's Activity Report, and state that, to the best of my knowledge and belief, the Owner has performed all activities represented by this report in accordance with the requirements of Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the repair/replacement activities and evaluation described in this report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Elmostafa Elkouri Digitally signed by Elmostafa Elkouri Date: 2021.03.02 07:35:23 -05'00' Commissions NB #13930, Endorsements A, N, I, C  
Inspector's Signature National Board, State, Province, and Endorsements

Date 3/2/2021

## Attachment 1

The H.B. Robinson Steam Electric Plant, Unit 2 (RNP), Fifth Ten-Year Interval Inservice Inspection (ISI) Plan, and Third Ten-Year Interval Containment Inservice Inspection (CISI) Plan complies with 10CFR50.55a(g), which implements, by reference, the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.

This summary report is submitted pursuant to the reporting requirements of ASME Section XI as amended by ASME Code Case N-532-5, "Repair/Replacement Activity Documentation Requirements and Inservice Inspection Summary Report Preparation and Submission Section XI, Division 1".

Contained within this summary report are the Owner's Activity Report, Form OAR-1, and Tables 1 and 2 of Code Case N-532-5 for RNP during Cycle 32 and Refueling Outage 32 (R2R32). R2R32 is the first of two outages of the third period in the fifth inspection interval for the ISI and Pressure Testing programs, and the first of two outages of the first period in the third inspection interval for the Containment ISI program. The Repair/Replacement activities from November 26, 2018 to December 9, 2020 are included. See the table below for the dates and revisions of the inspection plans.

Plan Title	Document Number and Revision	Date of Issue
Fifth Ten-Year Interval Inservice Inspection Plan	RNP-PM-008, Rev. 10	October 21 2019
Fifth Ten-Year Interval Inservice Inspection Schedule	RNP-PM-009, Rev. 7	October 21 2019
Augmented Inservice Inspection (AIS) Plan and Schedule	RNP-PM-012, Rev. 2	December 21, 2020
Third Ten-Year Interval Inservice IWE/IWL Inspection Plan	RNP-PM3-006, Rev. 0	September 9, 2019
Third Ten-Year Interval Inservice IWE/IWL Inspection Schedule	RNP-PM3-007, Rev. 0	September 9, 2019

**Table 1**  
**Items with Flaws or Relevant Conditions That Required Evaluation for**  
**Continued Service**

Exam Category and Item Number	Item Description	Evaluation Description
F-A/F1.20C	Spring Support 218/SI-3-6030: misalignment	Support was evaluated as functional and acceptable for continued service in as found condition per EC 418718. NCR 2359256 was generated to address the condition.
F-A/F1.40	Support 313/S6-1A: The fastener nuts on the south side support legs exhibited evidence of corrosion with material wastage.	Support was evaluated as functional and acceptable for continued service in as found condition per EC 418616. NCR 2356877 was generated to address the condition.
F-A/F1.20A	Support 244/SI-5-6003A: A missing nut was discovered on the pipe to clevis attachment.	Support was evaluated as functional and acceptable for continued service in the as found condition per the evaluation documented on report EV-20-RN2-003. NCR 2357719 was generated to address the condition.
F-A/F1.30B	Support 313/SW-1-H-1: Support is shown as embedded on the design drawing but is sitting on top of the floor in the field.	Support was evaluated as functional and acceptable for continued service in the as found condition per the evaluation documented on report EV-20-RN-2002. NCR 2357078 was generated to address this condition.
F-A/F1.20C	Support 262/FW-3A-6007: The settings were found to be out of tolerance on the spring hanger.	Support was evaluated as functional and acceptable for continued service in the as found condition per the evaluation documented on report EV-20-RN2-004. NCR 2359031 was generated to address the condition.
E-C/E4.11 <sup>1</sup>	Containment liner examinations revealed relevant conditions exceeding 10% of the nominal wall thickness resulting in evaluation to meet the requirements of IWE-3122.3 in accordance with IWE-3521(a).	EC 419006 was generated to document acceptance of the relevant conditions noted.

Note 1: See information required by 10 CFR 50.55a(b)(2)(ix)(A) in Attachment 2.

**Table 2**  
**Abstract of Repair/Replacement Activities Required for Continued Service**

Code Class	Item Description	Description of Work	Date Completed	Repair/Replacement Plan Number
1	SG-C Tubes	Steam Generator One Tube Plugging	11/4/2020	20370442
2	RHR -PMP-A	RHR-PMP-A Seal Replacement	12/6/2020	20437344

## **Attachment 2**

### **Containment Liner Plate**

#### **Requirements per 10 CFR 50.55a(b)(2)(ix)(A)(2)**

For each inaccessible area identified for evaluation, the applicant or licensee must provide the following in the ISI Summary Report as required by IWA-6000:

- (i) A description of the type and estimated extent of degradation, and the conditions that led to the degradation;
- (ii) An evaluation of each area, and the result of the evaluation; and
- (iii) A description of necessary corrective actions.

#### **Information required to meet 10 CFR 50.55a(b)(2)(ix)(A)(2)(i):**

##### **A. Description of Degradation**

1. During RNP Refueling Outage RO32 (Fall 2020), twenty-eight insulation panels were removed for inspection of the containment liner. The panels were in three groups: group 1 ranging from elevation 300'-308', approximate azimuth 30°-50°; group 2 ranging from elevation 304'-312', approximate azimuth 350°-5°, and group 3 ranging from elevation 268'-276', approximate azimuth 112°-160°. Twenty-seven of these panel inspections were first time inspections. Areas of general corrosion, as well as pitting, were found on twenty-one panels that exceeded 10% loss of nominal wall thickness. It is suspected that adjacent areas of the inaccessible liner may have similar conditions.

##### **B. Estimated Extent of Degradation**

1. Based on the findings of inspections during RO32, and previous outages since RO18 (Spring 1998), surface corrosion on the containment liner under the containment insulation panels is consistent throughout various areas of the containment liner. Areas of general corrosion exist on the liner underneath the insulation panels, as well as some areas of pitted corrosion. In all cases, degradation continues to meet the minimum required thickness for the liner to fully function as designed.
2. The containment liner of the dome is accessible for visual inspection and has not exhibited degradation shown to challenge the function of the leak tight liner membrane.
3. Selection of panels for inspection in RO32 was based on areas identified with distorted insulation panels and insufficient caulking between the insulation panels, as documented in CR 2239389. The distorted insulation system is a general condition over much of the liner.

##### **C. Description of Conditions That Led to the Degradation**

1. It is estimated that moisture from the environment comes in contact with the containment liner. The containment liner is covered by insulation panels, which are protected by metal sheathing panels. These sheathing panels are caulked at the joints to

create a cohesive insulation system. However, over time, the caulking of the insulation system has dried and cracked. This allows for panel distortion, and exposure of the insulation system to the containment atmosphere. It is estimated that exposure to the humid environment in areas of coating degradation cause corrosion of the containment liner.

**Information required to meet 10 CFR 50.55a(b)(2)(ix)(A)(2)(ii):**

- A. The containment liner is covered by an insulation system, and therefore inaccessible in accordance with ASME Code Interpretation XI-1-13-25. Evaluation of inaccessible areas of the vertical liner above the floor slab are evaluated based on the degradation found during liner inspections. Data from past inspections is considered to evaluate the liner. Despite the limitations of access in some areas, it is judged that the available sample size obtained since RO18 provides a representative sample of the vertical liner.

It is expected that the areas recently inspected during RO32, as well as areas inspected throughout the history of the plant, are representative of the vertical containment liner. Since RO18 (Spring 1998), approximately 400 insulation panels have been removed for inspection of the of the underlying liner. Examinations have taken place at various elevations and various azimuths. In some locations, physical obstructions exist, such as HVAC units, ducts, and support structures, which create hardship for inspection, particularly between the 280'-308' elevation. No inspections have been completed above the 308' elevation, as this is greater than 20' from the floor surface, and access is obstructed by the HVAC duct ring.

The RO32 inspection areas were targeted based off identified areas with loss of caulking adhesion between insulation panels. The row of insulation just above the ground slab at 228' elevation has previously been removed for liner inspection in both the first and second inspection intervals. This elevation was previously submerged during a small break LOCA in 1975 and has been fully inspected twice. Each time a panel is inspected, it is recoated as necessary, and left with an acceptable coating in place.

The worst case of liner corrosion found in all previously performed inspections has been pitting with up to 50% wall loss. These pits are small in area. The design analysis provides that the containment liner will continue to fully function with 50% wall loss over the entirety of the liner where nominal thickness is 3/8" (elevation from 253'-0" up to 351'-10"), and 64% wall loss over the entirety of the liner where nominal thickness is 1/2" (elevation from 226'-0" up to 253'-0").

This provides ample margin to the worst case as-found conditions for assurance that all areas of the containment liner remain acceptable to fully perform the design function. Additionally, in RO32, an integrated leak rate test was successfully performed, providing additional assurance that no leak paths through the liner currently exist.



**Information required to meet 10 CFR 50.55a(b)(2)(ix)(A)(2)(iii):**

- A. As a category E-C examination, successive inspections are required in subsequent periods in accordance with IWE-2420. A relief request for the third containment interval is under development to address this requirement. All inspected areas to date have been recoated as necessary and left with satisfactory coatings in place.
- B. Additional examinations of the containment liner are planned for the remaining of the interval. This plan is contingent upon approval of the relief requests, to focus on areas which have not been previously recoated or inspected for monitoring of corrosion on the liner.