



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

July 20, 2022

Mr. Thomas Haaf
Site Vice President
Duke Energy Progress, LLC
5413 Shearon Harris Road
Mail Code HNP01
New Hill, NC 27562-9300

**SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT – BIENNIAL PROBLEM
IDENTIFICATION AND RESOLUTION INSPECTION REPORT
05000400/2022011**

Dear Mr. Haaf:

On June 10, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed a problem identification and resolution inspection at your Shearon Harris Nuclear Power Plant. On June 9, 2022, the NRC inspectors discussed the results of this inspection with Ms. Kim Maza and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspection team reviewed the site's problem identification and resolution 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 problem identification and resolution 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.

No findings or violations of more than minor significance were identified during this inspection.

T. Haaf

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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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,



Signed by Fannon, Matthew
on 07/20/22

Matthew S. Fannon, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket No. 05000400
License No. NPF-63

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT – BIENNIAL PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION REPORT
05000400/2022011 – dated July 20, 2022

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| OFFICE | RII/DRP | RII/DRP | | | |
| NAME | A. Wilson | M. Fannon | | | |
| DATE | 07/12/2022 | 07/20/2022 | | | |

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Number: 05000400

License Number: NPF-63

Report Number: 05000400/2022011

Enterprise Identifier: I-2022-011-0024

Licensee: Duke Energy Progress, LLC

Facility: Shearon Harris Nuclear Power Plant

Location: New Hill, NC 27562

Inspection Dates: May 23, 2022 to June 10, 2022

Inspectors: S. Ninh, Senior Project Engineer
W. Pursley, Health Physicist
C. Smith, Resident Inspector
R. Taylor, Senior Project Engineer
A. Wilson, Senior Project Engineer (Team Lead)

Approved By: Matthew S. Fannon, Chief
Reactor Projects Branch 4
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 Shearon Harris Nuclear Power 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 of more than minor significance were identified.

Additional Tracking Items

None.

INSPECTION SCOPES

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.

OTHER ACTIVITIES – BASELINE

71152B - Problem Identification and Resolution

Biennial Team Inspection (IP Section 03.04) (1 Sample)

- (1) The inspectors performed a biennial assessment of the effectiveness of the licensee's Problem Identification and Resolution program, use of operating experience, self-assessments and audits, and safety conscious work environment.
 - Problem Identification and Resolution Effectiveness: The inspectors assessed the effectiveness of the licensee's Problem Identification and Resolution program in identifying, prioritizing, evaluating, and correcting problems. The inspectors also conducted a five-year review of equipment aging issues.
 - Operating Experience: The inspectors assessed the effectiveness of the licensee's processes for use of operating experience.
 - Self-Assessments and Audits: The inspectors assessed the effectiveness of the licensee's identification and correction of problems identified through audits and self-assessments.
 - Safety Conscious Work Environment: The inspectors assessed the effectiveness of the station's programs to establish and maintain a safety-conscious work environment.

INSPECTION RESULTS

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| Assessment | 71152B |
| 1. Corrective Action Program Effectiveness | |
| Problem Identification: The inspectors determined that the licensee was effective in identifying problems and entering them into the corrective action program and there was a low threshold for entering issues into the corrective action program. This conclusion was based on a review of the requirements for initiating condition reports as described in licensee procedure AD-PI-ALL-0100, "Corrective Action Program," and management's expectation that employees were encouraged to initiate condition reports. Additionally, site management was actively involved in the corrective action program and focused appropriate attention on significant plant issues. | |

Problem Prioritization and Evaluation: Based on the review of condition reports, the inspectors concluded that problems were prioritized and evaluated in accordance with the condition report significance determination guidance in procedure AD-PI-ALL-0100. The inspectors determined that adequate consideration was given to system or component operability and associated plant risk. The inspectors determined that plant personnel had conducted cause evaluations in compliance with the licensee's corrective action program procedures and cause determinations were appropriate, and considered the significance of the issues being evaluated.

Corrective Actions: Based on a review of corrective action documents, interviews with licensee staff, and verification of completed corrective actions, the inspectors determined that 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 inspectors reviewed effectiveness reviews to ensure corrective actions were properly implemented and were effective.

Based on the samples reviewed, the team determined that the licensee's corrective action program complied with regulatory requirements and self-imposed standards. The licensee's implementation of the corrective action program adequately supported nuclear safety.

2. Operating Experience

The inspectors determined that the station's processes for the use of industry and NRC operating experience information were effective and complied with all regulatory requirements and licensee standards. The implementation of these programs adequately supported nuclear safety. The inspectors concluded that operating experience was adequately evaluated for applicability and that appropriate actions were implemented to address lessons learned as needed.

3. Self-Assessments and Audits

The inspectors determined that the licensee effectively performed self-assessments and audits to identify issues at a low level, properly evaluate those issues, and resolve them commensurate with their safety significance. Self-assessments were generally detailed and critical. The inspectors verified that corrective action documents were initiated to document areas for improvement and findings resulting from self-assessments and verified that actions had been completed consistent with those recommendations. Quality assurance program audits appropriately assessed performance and identified areas for improvement.

4. Safety Conscious Work Environment

Based on safety culture interviews with plant personnel, reviews of the latest safety culture survey results, and interviews with employee concerns program personnel, the inspectors found no evidence of challenges to the safety conscious work environment. Employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

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| Minor Violation | 71152B |
| <p>Minor Violation: During the inspectors' review of the maintenance rule program implementation, specifically the documentation of local leak rate test (LLRT) 1SP-40 "Pressurizer Liquid Space Sample Valve (IRC)," 1SP-41 "Pressurizer Liquid Space Sample Valve (ORC)," 1SP-84 "Safety Injection System Accumulator "C" Sample Valve (IRC)," and 1SP-85 "Safety Injection System Accumulator "C" Sample Valve (ORC)," the maintenance rule evaluations concluded that a functional failure had occurred for each penetration. The licensee's evaluation concluded that the failures were representative of a Repetitive Maintenance Rule Functional Failure (MRFF). In accordance with procedure AD-EG-ALL-1210, "Maintenance Rule Program," Rev. 2, step 5.6.2.4.b, a Maintenance Rule (a)(1) evaluation was required for a Repetitive MRFF. Contrary to this procedure requirement, the inspectors found that no Maintenance Rule (a)(1) evaluation was completed. AD-EG-ALL-1210 is used to establish a program for implementing and maintaining the NRC Maintenance Rule as required by Title 10 of the Code of Federal Regulations (10 CFR) 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants." The inspectors determined the failure to accomplish step 5.6.2.4.b of AD-EG-ALL-1210 represents a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings."</p> <p>Screening: The inspectors determined the performance deficiency was minor. This performance deficiency was screened in accordance with Inspection Manual Chapter (IMC) 0612 Appendix B, "Issue Screening Directions," dated October 1, 2021, and was determined to be of minor significance because when the Maintenance Rule (a)(1) evaluation was completed for the repetitive MRFF, it was concluded that the initial maintenance rule evaluations failed to take into account the LLRT leakage test failures of each penetration were not in excess of the administrative limits as defined in EST-212, "Type C Local Leak Rate Test," and were evaluated as acceptable in Engineering Change 419545. Therefore, the licensee ultimately concluded that the LLRT failures should not be considered functional failures, and thus no unacceptable performance occurred, and the barrier integrity cornerstone objectives were not adversely affected.</p> <p>Enforcement: This failure to comply with 10 CFR Part 50, Appendix B, Criterion V, constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.</p> | |

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| Observation: Residual Heat Removal (RHR) Breaker Failure Observation | 71152B |
| <p>The inspectors reviewed Nuclear Condition Report (NCR) 02376252, originated on March 29, 2021, which documented a failure of the 'B' RHR pump breaker during testing due to a termination that became loose over time and disconnected due to vibrations experienced during breaker cycling. The licensee had experienced a similar breaker failure in 2001, documented in NCR 29022, and recognized that the spade type connections had the potential of coming loose. Actions were initiated in 2001 due to the loose connection and a corrective action was implemented in PM-E0044, "480 VAC Siemens Type RLN(F) Load Center Breaker and Cubicle PM," that required the installation of Ty-Wraps near the connection point to reduce the probability of the connection from coming loose. The inspectors observed that the corrective actions implemented in 2001 did not prevent the failure of the RHR breaker in 2021. NCR 02376252 determined that PM-E0044 could be enhanced by directing the staff to ensure that spade type connections are confirmed to be tight to prevent slip on the connector. Additionally, a revision to PM-E0044 clarified that where the breaker frame is inaccessible Ty-Wraps are to be installed to fasten to adjacent</p> | |

wiring. The inspectors observed that NCR 02376252 did not clarify the as-found configuration of the Ty-Wraps installed on the RHR breaker connection that came loose. The inspectors observed that no similar failures have occurred since PM-E0044 has been revised with the updated guidance, however, the vendor design using slip on spade type connections is not optimum and that a design weakness still remains.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On June 9, 2022, the inspectors presented the biennial problem identification and resolution inspection results to Ms. Kim Maza and other members of the licensee staff.

DOCUMENTS REVIEWED

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|----------------------|-----------------------------|--|----------------------|------------------|
| 71152B | Corrective Action Documents | 2212531 2222505 2223719 2224273 2232409 2235891 2258970 2259418 2263709 2276765 2288171 2297861 2297958 2300449 2311457 2320227 2321895 2326566 2330396 2335154 2337926 2339383 2339968 2339978 2340658 2342424 2342816 2344303 2347273 2347492 2348031 2349762 | | |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|----------------------|------|-------------|----------------------|------------------|
| | | 2350357 | | |
| | | 2351619 | | |
| | | 2353159 | | |
| | | 2353624 | | |
| | | 2354050 | | |
| | | 2354786 | | |
| | | 2355203 | | |
| | | 2355227 | | |
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| | | 2359532 | | |
| | | 2360087 | | |
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| | | 2366635 | | |
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| | | 2369538 | | |
| | | 2372140 | | |
| | | 2372270 | | |
| | | 2374367 | | |
| | | 2374915 | | |
| | | 2376252 | | |
| | | 2379092 | | |
| | | 2379651 | | |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|----------------------|------|-------------|----------------------|------------------|
| | | 2379780 | | |
| | | 2380375 | | |
| | | 2380478 | | |
| | | 2380481 | | |
| | | 2380777 | | |
| | | 2380884 | | |
| | | 2381326 | | |
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| | | 2400230 | | |
| | | 2403501 | | |
| | | 2403733 | | |
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| | | 2406828 | | |
| | | 2408631 | | |
| | | 2408989 | | |
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| | | 2409079 | | |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|----------------------|---|--|--|------------------|
| | | 2409314 2410990 2411360 2411682 2411730 2412354 2413545 2413628 2413948 2417230 2417987 2418968 2419412 2420239 2420406 2421858 2422025 2422807 2422808 2423085 2423332 2424516 2426647 2426973 | | |
| | Corrective Action Documents Resulting from Inspection | 2428530 | Missed Maintenance Rule (a)(1) Evaluation | |
| | | 2430708 | NRC PI&R Inspection Observation | |
| | Engineering Changes | EC 419545 | Acceptability of Valves Exceeding LLRT Admin Limits Exiting RFO-23 | REVISION 0 |
| | Engineering Evaluations | ESR 9800571 | Calculation HNP-C/STRS-1050, Evaluation of Permanent Lead Shielding Installed on RHR Pump 1A | 12/23/1998 |
| | | ESR-9900169 | Evaluation of Permanent Lead Shielding Installed on RHR Pump | 01/28/2000 |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date | |
|----------------------|---------------|----------------------------------|----------------------|---|------------|
| | | EVAL-2020-HNP-1065-00002161 | | | |
| | | EVAL-2020-HNP-4085-00002154 | | | |
| | | EVAL-2020-HNP-5015-00002157 | | | |
| | | EVAL-2021-HNP-2085-00002177 | | | |
| | | EVAL-2021-HNP-5145-00002175 | | | |
| | | EVAL-2021-HNP-5175-00002173 | | | |
| | Miscellaneous | | | Station Health Report - Emergency Diesel Generator and Auxiliaries | 12/31/2021 |
| | | AD-EG-ALL-1207 | | Plant Health Process for Bridging Strategy for Refurbishment of the Siemens, Model RLN, 480V Circuit Breakers | |
| | | CSD-AD-ALL-0004-01 | | CORRECTIVE ACTION PROGRAM REVIEW MEETING | REVISION 7 |
| | | EVT-2085-2021-00075447 | | Maintenance Rule Manager Event | |
| | | EVT-5145-2021-00075253 | | Maintenance Rule Manager Event | |
| | | EVT-5175-2021-00075457 | | Maintenance Rule Manager Event | |
| | | MTG- 2021-00000291 | | Maintenance Rule Meeting Minutes | |
| | | MTG-2022-00000323 | | Maintenance Rule Meeting Minutes | |
| | | MTG-2022-00000328 | | Maintenance Rule Meeting Minutes | |
| | | MTG-2022-00000336 | | Maintenance Rule Meeting Minutes | |
| MTG-2022-00000345 | | Maintenance Rule Meeting Minutes | | | |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|----------------------|------------|---|--|------------------|
| | | TTC1018-N CAP Overview for New Employees | | |
| | Procedures | AD-LS-ALL--0003 | NRC AUDIT AND INSPECTION ACTIVITIES | REVISION 10 |
| | | AD-MN-ALL-0017 | HOUSEKEEPING, MATERIAL CONDITION, AND SEISMIC REQUIREMENTS FOR EQUIPMENT STORAGE | REVISION 1 |
| | | AD-PI-ALL-0400 | OPERATING EXPERIENCE PROGRAM | REVISION 11 |
| | | ADMINISTRATIVE PROCEDURE, AD-EG-ALL-1214 | CONDITION MONITORING OF STRUCTURES | REVISION 1 |
| | | ADMINISTRATIVE PROCEDURE, AD-WC-ALL-0210 | WORK REQUEST INITIATION, SCREENING, PRIORITIZATION AND CLASSIFICATION. | REVISION 15 |
| | | ADMINISTRATIVE PROCEDURE, AD-EG-ALL-1104 | OBSOLESCENCE PROGRAM | REVISION 5 |
| | | ADMINISTRATIVE PROCEDURE, AD-EG-ALL-1202, | PREVENTIVE MAINTENANCE AND SURVEILLANCE TESTING ADMINISTRATION | REVISION 11 |
| | | ADMINISTRATIVE PROCEDURE, AD-EG-ALL-1206 | EQUIPMENT RELIABILITY CLASSIFICATION | REVISION 6 |
| | | ADMINISTRATIVE PROCEDURE, AD-EG-ALL-1210 | MAINTENANCE RULE PROGRAM | REVISION 2 |
| | | ADMINISTRATIVE PROCEDURE, AD-EG-ALL-1210 | MAINTENANCE RULE PROGRAM | REVISION 3 |
| | | ADMINISTRATIVE PROCEDURE, AD-EG-ALL-1650 | LICENSE RENEWAL AGING MANAGEMENT | REVISION 4 |
| | | ADMINISTRATIVE | BORIC ACID CORROSION CONTROL PROGRAM – | REVISION 4. |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|----------------------|-------------------|--|---|------------------|
| | | PROCEDURE, AD-EG-PWR-1611 | IMPLEMENTATION | |
| | | ADMINISTRATIVE PROCEDURE, AD-OP-ALL-0105 | OPERABILITY DETERMINATIONS | REVISION 6 |
| | | ADMINISTRATIVE PROCEDURE, AD-PI-ALL-0100 | CORRECTIVE ACTION PROGRAM | REVISION 27 |
| | | ADMINISTRATIVE PROCEDURE, AD-PI-ALL-0101 | ROOT CAUSE EVALUATION | REVISION 8 |
| | | ADMINISTRATIVE PROCEDURE, AD-PI-ALL-0106 | CAUSE INVESTIGATION CHECKLISTS | REVISION 7 |
| | | ADMINISTRATIVE PROCEDURE, AD-RP-ALL-5000 | PREPARATION AND SHIPMENT OF RADIOACTIVE MATERIAL AND RADIOACTIVE WASTE | REVISION 5 |
| | | ADMINISTRATIVE PROCEDURE, AD-WC-ALL-0250 | WORK IMPLEMENTATION AND COMPLETION | REVISION 14 |
| | | AP-038 | DEFICIENCY TAG PROCEDURE | REVISION 14 |
| | | ENGINEERING SURVEILLANCE TEST, NUMBER: EST-212 | TYPE C LOCAL LEAK RATE TESTS | REVISION 63 |
| | | PM-E0044 | 480 VAC SIEMENS TYPE RLN(F) LOAD CENTER BREAKER AND CUBICLE P.M. | REVISION 24, 25 |
| | Radiation Surveys | HNP-M-20210505-8 | Follow-up Survey in Chemistry Lab Following Dose Rate Alarm | 05/05/2021 |
| | Self-Assessments | 2020-FLEET-CAP-01 | NUCLEAR OVERSIGHT - AUDIT FLEET PERFORMANCE IMPROVEMENT AND CORRECTIVE ACTION PROGRAM | |
| | | 2020-HNP-SEC-01 | NUCLEAR OVERSIGHT - AUDIT HARRIS PHYSICAL SECURITY | |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
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| | | 2021-HNP-ENG-01 | NUCLEAR OVERSIGHT - AUDIT HARRIS ENGINEERING | |
| | | 2021-HNP-MNT-01 | NUCLEAR OVERSIGHT - AUDIT HARRIS MAINTENANCE AND SPECIAL PROCESSES | |
| | | 2022-HNP-FIRE-01 | NUCLEAR OVERSIGHT - AUDIT HARRIS FIRE PROTECTION | |
| | | 2022-HNP-OPT-01 | NUCLEAR OVERSIGHT - AUDIT HARRIS OPERATIONS TRAINING | |
| | | 2340613-05 | 2020 CR Initiation Rate Analysis | 07/22/2020 |
| | | 2363582-05 | Operator Knowledge of Important Parameters and Control | 08/17/2021 |
| | | 2370171-05 | Operational Risk | 03/04/2021 |
| | | 2406757-05 | HNP 2022 NRC PI&R Readiness Assessment | 02/17/2022 |
| | | RP Bench Strength 5-2-22 (1).xlsx (Excel Spreadsheet) | Harris Radiation Protection Technician Qualification Tracker | 05/22/2022 |
| | Work Orders | 02339383 02340658 02359190 02361630 02372270 02380375 02380478 02380884 02389593 02390237 02392028 02392806 02395124 02398689 02409078 02409079 02410990 02412354 | | |

| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|----------------------|------|--|---|------------------|
| | | 02413948 20459046 20445753 20460102 20203719 | | |
| | | W/O 98704-1 | Perform PM E0044, Perform 480VAC Cubicle and Breaker Inspection and Cleaning for RHR Pump 1B-SB | 06/06/2014 |