



Benjamin C. Waldrep
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919.362.2502

10 CFR 50.73

October 5, 2016
Serial: HNP-16-082

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Shearon Harris Nuclear Power Plant, Unit 1
Docket No. 50-400/Renewed License No. NPF-63

Subject: Licensee Event Report 2016-003-00

Ladies and Gentlemen:

Duke Energy Progress, LLC, submits the enclosed Licensee Event Report, 2016-003-00, in accordance with 10 CFR 50.73 for Shearon Harris Nuclear Power Plant, Unit 1. This report details a condition affecting the site's containment high-range radiation monitors (CHRRMs). The CHRRMs were declared inoperable on September 21, 2016, due to the potential impact of temperature induced current on the accuracy of the CHRRMs, as documented per Information Notice 97-45, Supplement 1.

This document contains no regulatory commitments. Please refer any questions regarding this submittal to John Caves, Manager of Regulatory Affairs, at (919) 362-2406.

Sincerely,

A handwritten signature in black ink, appearing to read "Ben C. Waldrep", written in a cursive style.

Benjamin C. Waldrep

Enclosure: Licensee Event Report 2016-003-00

cc: Mr. M. J. Riches, NRC Sr. Resident Inspector, HNP
Ms. M. Barillas, NRC Project Manager, HNP
Regional Administrator, Region II

**LICENSEE EVENT REPORT (LER)**

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 e-mail to 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

Shearon Harris Nuclear Power Plant - Unit 1

2. DOCKET NUMBER

05000 400

3. PAGE

1 OF 3

4. TITLE

Containment High-Range Radiation Monitors Declared Inoperable Due to Potential for Temperature Induced Current

| 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 | | |
| 9 | 21 | 2016 | 2016 | 003 | 00 | 10 | 5 | 2016 | None. | 05000 N/A | | |
| | | | | | | | | | FACILITY NAME | DOCKET NUMBER | | |
| | | | | | | | | | | 05000 N/A | | |
| 9. OPERATING MODE | | | 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) | | | | | | | | | |
| 1 | | | <input type="checkbox"/> 20.2201(b) | | | <input type="checkbox"/> 20.2203(a)(3)(i) | | | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | | <input type="checkbox"/> 50.73(a)(2)(viii)(A) | |
| | | | <input type="checkbox"/> 20.2201(d) | | | <input type="checkbox"/> 20.2203(a)(3)(ii) | | | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | | <input type="checkbox"/> 50.73(a)(2)(viii)(B) | |
| | | | <input type="checkbox"/> 20.2203(a)(1) | | | <input type="checkbox"/> 20.2203(a)(4) | | | <input type="checkbox"/> 50.73(a)(2)(iii) | | <input type="checkbox"/> 50.73(a)(2)(ix)(A) | |
| | | | <input type="checkbox"/> 20.2203(a)(2)(i) | | | <input type="checkbox"/> 50.36(c)(1)(i)(A) | | | <input type="checkbox"/> 50.73(a)(2)(iv)(A) | | <input type="checkbox"/> 50.73(a)(2)(x) | |
| 100 | | | <input type="checkbox"/> 20.2203(a)(2)(ii) | | | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | | | <input type="checkbox"/> 50.73(a)(2)(v)(A) | | <input type="checkbox"/> 73.71(a)(4) | |
| | | | <input type="checkbox"/> 20.2203(a)(2)(iii) | | | <input type="checkbox"/> 50.36(c)(2) | | | <input type="checkbox"/> 50.73(a)(2)(v)(B) | | <input type="checkbox"/> 73.71(a)(5) | |
| | | | <input type="checkbox"/> 20.2203(a)(2)(iv) | | | <input type="checkbox"/> 50.46(a)(3)(ii) | | | <input type="checkbox"/> 50.73(a)(2)(v)(C) | | <input type="checkbox"/> 73.77(a)(1) | |
| | | | <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)(D) | | <input type="checkbox"/> 73.77(a)(2)(i) | |
| | | | <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)(vii) | | <input type="checkbox"/> 73.77(a)(2)(ii) | |
| | | | | | | <input type="checkbox"/> 50.73(a)(2)(i)(C) | | | <input checked="" type="checkbox"/> OTHER | | Specify in Abstract below or in NRC Form 366A | |

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT

John Caves - Manager, Regulatory Affairs.

TELEPHONE NUMBER (Include Area Code)

(919) 362-2406

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 |
|-------|--------|-----------|---------------|--------------------|-------|--------|-----------|---------------|--------------------|
| B | IL | CBL1 | RSCC | N | | | | | |

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)

On February 17, 1998, the NRC issued Information Notice (IN) 97-45, Supplement 1, to alert licensees of the potential of erratic indications from high-range radiation monitors as result of a problem with the associated coaxial cables. These erratic indications could mislead operators assessing radiation levels in the containment building during accident scenarios. The erratic indications result from positive and negative current flow when exposed to transient temperature conditions, such as those postulated during a loss-of-coolant accident or a main steamline break. This phenomenon is known as temperature induced current (TIC), and could result in false high radiation readings for approximately 15 minutes following a design basis accident.

On September 21, 2016, Shearon Harris Nuclear Power Plant (Harris) declared both Containment High-Range Radiation Monitors (CHRRMs) inoperable. The CHRRMs utilize Rockbestos cables similar to those described in IN 97-45, Supplement 1. The use of these cables by Harris is historical, going back at least 20 years. To address, Harris will either test the cables to quantify a correction factor, replace the impacted cables with cables less susceptible, or complete a License Amendment Request to restore compliance.

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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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|---------------------------------------------|------------------|---------------|-------------------|---------|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. |
| Shearon Harris Nuclear Power Plant - Unit 1 | 05000-400 | 2016 | 003 | 00 |

NARRATIVE

Note: Energy Industry Identification System (EIIIS) codes are identified in the text within brackets [].

A. Background

Event Date: September 21, 2016 Mode: 1 Reactor Power: 100 percent

No change in plant mode or in reactor power occurred as a result of the conditions described in this report.

On February 17, 1998, the NRC issued Information Notice (IN) 97-45, Supplement 1, to alert licensees of the potential of erratic indications from high-range radiation monitors as result of a problem with their associated coaxial cables. These erratic indications could mislead operators assessing radiation levels in the containment building during accident scenarios. The erratic indications result from positive and negative current flow when exposed to transient temperature conditions, such as those postulated during a loss-of-coolant accident or a main steamline break. This phenomenon is known as temperature induced current (TIC), and could result in false high radiation readings for approximately 15 minutes following a design basis accident.

B. Event Description

On September 21, 2016, Shearon Harris Nuclear Power Plant, Unit 1, (Harris) declared both Containment High-Range Radiation Monitors (CHRRMs) [RIT] inoperable following a review of the previous actions taken in response to IN 97-45, Supplement 1, and determining them to be inadequate. The CHRRMs utilize Rockbestos cables [CBL1] similar to those described in IN 97-45, Supplement 1. The use of these cables by Harris is historical, going back at least 20 years.

The CHRRMs are part of the Radiation Monitoring System [IL] and provide an estimate to operations personnel of radioactivity inside containment for the purpose of detection of, or verification of, a breach of fission product barriers, and for monitoring and accessing conditions following an accident. This is a safety-related function that is required for Technical Specification (TS) operability. This is a monitoring function only, and does not initiate any specific control actions or provide an actuation signal for other equipment.

For inoperable CHRRMs, TS requires "either restore the inoperable channel(s) to OPERABLE status within 7 days or prepare and submit a Special Report to the Commission, pursuant to Specification 6.9.2, within the next 14 days." The cables have been installed for at least 20 years, with none of the TS-prescribed actions occurring. Thus, this condition is reportable as a condition prohibited by TS per 10 CFR 50.73(a)(2)(i)(B). In addition, the CHRRMs will not be restored to operable in 7 days, thus the TS 6.9.2 Special Report is required. This LER is being submitted to address both reporting requirements.

The potentially impacted components are coaxial cables manufactured by RSCC under the name Rockbestos, model RSS-6-104/LD.

C. Causal Factor

The cables were installed in accordance with Harris' design configuration. The use of these cables by Harris is historical, going back at least 20 years.

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NARRATIVE**D. Safety Analysis**

The CHRRMs provide a monitoring function only, and do not initiate any specific control actions or provide an actuation signal for other components. These monitors do not perform a specific function in mitigating the consequences of an accident, and are not modeled per Probabilistic Risk Assessment. Alternate means of monitoring conditions in containment are available to the operators. This condition does not render the CHRRMs inoperable for all conditions, but only for a period of about 15 minutes immediately following a loss-of-coolant accident or a main steamline break. Periodic testing of the CHRRMs has not revealed any other conditions that would challenge the monitor's accuracy or reliability. Therefore, this condition represents a degradation of low safety significance.

At no point in the potentially impacted period were the CHRRMs required to provide information during a design basis accident. Thus, there is no consequence to the health and safety of site personnel or to the public.

E. Corrective Actions**Completed Actions:**

Information regarding this condition has been added to the Operations' Turnover sheet to ensure adequate awareness by operations.

Planned Actions:

Either (1) perform site specific testing on the currently installed cables to implement a correction factor for use with the radiation monitoring system, (2) replace the affected cables with cables not impacted by TIC, or (3) gain NRC approval of a License Amendment Request to restore compliance.

F. Additional Information

There have been no previous Licensee Event Reports due to the impact of TIC on the CHRRMs.