



LICENSEE EVENT REPORT (LER)

(See Page 3 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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk all: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name

Braidwood Station, Unit 1

2. Docket Number

05000456

3. Page

1 OF 3

4. Title

Liquid Penetrant Indications in Control Rod Drive Mechanism Nozzle Seal Weld Repair due to Subsurface Weld Defects Opening Up from Thermal and Pressure Stresses during Operation

5. Event Date

| Month | Day | Year |
|-------|-----|------|
| 10 | 07 | 2022 |

6. LER Number

| Year | Sequential Number | Revision No. |
|------|-------------------|--------------|
| 2022 | - 001 - | 00 |

7. Report Date

| Month | Day | Year |
|-------|-----|------|
| 11 | 30 | 2022 |

8. Other Facilities Involved

| Facility Name | Docket Number |
|---------------|---------------|
| N/A | N/A |
| Facility Name | Docket Number |
| N/A | N/A |

9. Operating Mode

6

10. Power Level

000

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> 10 CFR Part 20 | <input type="checkbox"/> 20.2203(a)(2)(vi) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) |
| <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | 10 CFR Part 73 |
| <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.69(g) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(4) |
| <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> 73.71(a)(5) |
| <input type="checkbox"/> 20.2203(a)(2)(i) | 10 CFR Part 21 | <input type="checkbox"/> 50.73(a)(2)(i)(B) | <input type="checkbox"/> 50.73(a)(2)(v)(D) | <input type="checkbox"/> 73.77(a)(1)(i) |
| <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 21.2(c) | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input type="checkbox"/> 50.73(a)(2)(vii) | <input type="checkbox"/> 73.77(a)(2)(i) |
| <input type="checkbox"/> 20.2203(a)(2)(iii) | 10 CFR Part 50 | <input checked="" type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) | <input type="checkbox"/> 73.77(a)(2)(ii) |
| <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <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)(v) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) | |

OTHER (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact

Dane Brunswick, Regulatory Assurance Manager

Phone Number (Include area code)

(815) 417-2800

13. Complete One Line for each Component Failure Described in this Report

| Cause | System | Component | Manufacturer | Reportable to IRIS | Cause | System | Component | Manufacturer | Reportable to IRIS |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
| B | AB | 1718E72 | W120 | Y | N/A | N/A | N/A | N/A | N/A |

14. Supplemental Report Expected

No Yes (If yes, complete 15. Expected Submission Date)

15. Expected Submission Date

| Month | Day | Year |
|-------|-----|------|
| N/A | N/A | N/A |

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On October 7, 2022, during a Liquid Penetrant examination on the embedded flaw seal weld repair of Control Rod Drive Mechanism Penetration 69, five 1/4-inch rounded indications were discovered that were determined to be unacceptable per the acceptance criteria in ASME Section III.

The cause of these indications is attributed to existing mechanical discontinuities/minor subsurface voids growing or opening to the weld surface due to thermal and/or pressure stresses during plant operation. The indications were reduced to an acceptable dimension by grinding/blending the indications to meet the applicable acceptance criteria in ASME Section III.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(ii)(A), "any event or condition that results in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded" since the as-found indications did not meet the applicable acceptance criterion referenced in ASME Section III to remain in service without repair.



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

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| 1. FACILITY NAME | 2. DOCKET NUMBER | 3. LER NUMBER | | |
|---------------------------|------------------|---------------|-------------------|---------|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. |
| Braidwood Station, Unit 1 | 05000456 | 2022 | - 001 | - 00 |

NARRATIVE

A. Plant Operating Conditions Before the Event:

Event Date: October 7, 2022

Unit: 1 MODE: 6

Unit 1 Reactor Coolant System (RCS) [AB]: Not Applicable

No structures, systems or components were inoperable at the start of this event that contributed to the event.

B. Description of Event:

On October 07, 2022, a Liquid Penetrant (PT) examination on the embedded flaw seal weld repair of Control Rod Drive Mechanism (CRDM) Penetration 69 was performed. During the PT examination, five unacceptable 1/4-inch rounded indications were discovered on the embedded flaw seal weld repair of the penetration. Rounded indications that exceed 3/16 inches in any dimension are unacceptable per the acceptance criteria in ASME Section III.

- The first indication is a 1/4-inch rounded indication located at 90 degrees at the weld saddle of the penetration.
- The second indication is a 1/4-inch rounded indication located at 90 degrees on the nozzle portion of the seal weld and 0.5 inches from the transition of the head to the penetration.
- The third indication is a 1/4-inch rounded indication located at 90 degrees on the nozzle portion of the seal weld and 1.5 inches from the transition of the head to the penetration.
- The fourth indication is a 1/4-inch rounded indication located at 180 degrees on the nozzle portion of the seal weld and 1 inch from the transition of the head to the penetration.
- The fifth indication is a 1/4-inch rounded indication located at 180 degrees on the nozzle portion of the seal weld and 2.5 inches from the transition of the head to the penetration. This indication was discovered during a prior TP examination in refueling outage A1R21 (October 10, 2019), and at the time was at an acceptable size per ASME Section III. This was the only indication of the five that was present during a prior examination.

0 degrees azimuth is the location at the outermost portion of the penetration on the flange side (downhill/outermost side). The transition is the point where the vertical portion of the penetration meets the horizontal area of the reactor head.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(ii)(A), "any event or condition that results in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded" since the as-found indications did not meet the applicable acceptance criterion referenced in ASME Section III to remain in service without repair. This LER is being submitted in follow-up to ENS 56153 made on October 7, 2022, at 0735 CDT.

C. Cause of Event

The cause of these indications is attributed to existing mechanical discontinuities/minor subsurface voids growing or opening to the weld surface due to thermal and/or pressure stresses during plant operation. Unacceptable rounded indications have previously been identified on the embedded flaw seal weld repair on CRDM Penetration 69.



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| Braidwood Station, Unit 1 | 05000456 | 2022 | - 001 | - 00 |

NARRATIVE

D. Safety Consequences:

This condition had no actual safety consequences impacting plant or public safety.

Each unacceptable indication was identified in a timely manner during routine inspection activities and repaired prior to through wall leakage occurring. None of the indications penetrated through the embedded seal weld repair. Were these indications to go undetected, they could have potentially propagated through the embedded seal weld repair over time, creating a leak path through the reactor coolant pressure boundary. With these required inspections being performed at the required intervals, detected degradation that does not meet acceptance criteria will be repaired or evaluated prior to reaching any level of significance. This condition is limited to CRDM Penetration 69 at Braidwood Unit 1. CRDM Penetration 69 is the only penetration at Braidwood Unit 1 that has been repaired utilizing this embedded flaw seal weld repair method.

Bare metal visual examination on the reactor vessel closure head did not detect any evidence of reactor coolant pressure boundary leakage. Volumetric examination did not detect any evidence of through-wall reactor coolant pressure boundary leakage. Based on the characteristics and dimensions of the unacceptable indications discovered during PT examination, there was no loss of safety function due to these indications.

E. Corrective Actions:

Actions were completed to grind/blend the indications to remove or reduce the indication size to meet the applicable acceptance criteria in ASME Section III. Progressive PT examination was performed during the grinding/blending to determine if the indications met acceptance criteria, and all five of the previously unacceptable indications were determined to meet acceptance criteria via PT examination.

F. Previous Occurrences:

Previous Licensee Event Reports were made in June 2012, November 2013, June 2015 and November 2016 at Braidwood Station Unit 1 for indications on CRDM penetration 69 (LER 2012-002-00, LER 2013-002-00, LER 2015-002-00 and LER 2016-003-00).

G. Component Failure Data:

| <u>Manufacturer</u> | <u>Nomenclature</u> | <u>Model</u> | <u>Mfg. Part Number</u> |
|---------------------|---|--------------|-------------------------|
| Westinghouse | Reactor Vessel Integrated Head Package Termination | 1718E72 | N/A |