



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 <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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1. Facility Name
Sequoyah Nuclear Plant Unit 2

2. Docket Number
05000328

3. Page
1 OF 6

4. Title
Ice Bed Inoperable Due to Exceeding Surveillance Requirement Frequency

| 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 |
| 07 | 25 | 2021 | 2021 | - 001 - | 00 | 09 | 22 | 2021 | NA | 05000 |
| | | | | | | | | | NA | 05000 |

9. Operating Mode

1

10. Power Level

100

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

| 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 checked="" 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 checked="" 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 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 in NRC 366A).

12. Licensee Contact for this LER

Licensee Contact

Scott Bowman

Phone Number (Include Area Code)

423.843.6910

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 |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
| X | BC | MPX | Y006 | N | | | | | |

14. Supplemental Report Expected

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

15. Expected Submission Date

| Month | Day | Year |
|-------|-----|------|
| | | |

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

On July 25, 2021, at 0544 eastern daylight time (EDT), the SQN Unit 2 ice bed temperature monitoring system stopped providing accurate data for the ice bed. The data is used to complete a surveillance instruction (SI) to verify the ice bed temperature does not exceed 27 degrees Fahrenheit (F) as required by Technical Specification (TS) Surveillance Requirement (SR) 3.6.12.1 at a Frequency of every 12 hours. Due to the failure, Main Control Room operators authorized performance of 2-SI-IXX-061-138.0, Backup Ice Condenser Temperature Monitoring. At 1258, SR 3.6.12.1 was successfully performed; however, the completion time exceeded the specified Frequency plus the 25 percent extension allowed by SR 3.0.2 by 20 minutes (SR 3.6.12.1 had last been completed at 2138 on July 24). Therefore, the Unit 2 ice bed was declared inoperable for 20 minutes from 1238 until 1258.

The cause of the event was the failure of the ice bed temperature monitoring system remote scanner due to an internal power supply failure. Corrective actions for this event include developing procedural guidance for the response required for a nonfunctional ice bed temperature monitoring system and replacement of obsolete instrumentation in the ice bed temperature monitoring system.

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

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|-------------------------------|------------------|---------------|-------------------|---------|
| | | YEAR | SEQUENTIAL NUMBER | REV NO. |
| Sequoyah Nuclear Plant Unit 2 | 05000-328 | 2021 | - 001 | - 00 |

NARRATIVE**I. Plant Operating Conditions Before the Event**

At the time of the event, Sequoyah Nuclear Plant (SQN) Unit 2 was in Mode 1 at 100 percent rated thermal power.

II. Description of Event**A. Event Summary:**

On July 25, 2021, at 0544 eastern daylight time (EDT), the SQN Unit 2 ice bed [EIS: BC] temperature monitoring system stopped providing accurate data for the ice bed due to the failure of a remote scanner [EIS: MPX] in the system. The data is used to complete a surveillance instruction (SI) to verify the ice bed temperature does not exceed 27 degrees Fahrenheit (F) as required by Technical Specification (TS) Surveillance Requirement (SR) 3.6.12.1 at a Frequency of every 12 hours. Due to the failure, Main Control Room (MCR) operators authorized performance of 2-SI-IXX-061-138.0, Backup Ice Condenser Temperature Monitoring, which requires calling in instrumentation and controls technicians to take resistance temperature detector readings on individual temperature elements inside containment.

At 1258, SR 3.6.12.1 was successfully performed; however, the completion time exceeded the specified Frequency plus the 25 percent extension allowed by SR 3.0.2 by 20 minutes (SR 3.6.12.1 had last been completed at 2138 on July 24). SR 3.0.1 states, in part, "[f]ailure to perform a Surveillance within the specified Frequency shall be failure to meet the LCO [limiting condition for operation]." Therefore, the Unit 2 ice bed was declared inoperable for 20 minutes from 1238 until 1258.

At 1600, an 8-hour non-emergency event notification (EN 55379) was made to the NRC in accordance with 10 CFR 50.72(b)(3)(v), as an event or condition that could have prevented the fulfillment of a safety function of structures or systems that are needed to: (C) control the release of radioactive material and (D) mitigate the consequences of an accident. This LER is submitted based on NUREG-1022, Revision 3, Section 3.2.7 guidance that identifies that the requirements of 10 CFR 50.73(a)(2)(v) apply when a system that is within the scope of the criterion is declared inoperable and no redundant system or equipment could be declared operable (the ice bed is a single train system).

Although the Frequency of SR 3.6.12.1 was exceeded and required the Unit 2 ice bed to be declared inoperable, the Unit 2 ice bed remained below 27 degrees F and capable of performing its required safety function to provide a heat sink during a Design Basis Accident (DBA) in containment. Therefore, no loss of safety function occurred.

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- B. Status of structures, components, or systems that were inoperable at the start of the event and contributed to the event:

No inoperable structures, components, or systems contributed to this event.

- C. Dates and approximate times of occurrences:

| Date/Time (EDT) | Description |
|-----------------|--|
| 07/24/21, 2138 | SR 3.6.12.1 successfully performed. |
| 07/25/21, 0538 | The Plant Engineering Data System indicated the maximum ice bed temperature was 20.93 degrees. |
| 0544 | MCR operators recognized the Ice Bed Temperature Monitoring System was nonfunctional. |
| 1030 | Operations personnel authorized a conditional performance of 2-SI-IXX-061-138.0, Backup Ice Condenser Temperature Monitoring. |
| 1238 | SR 3.6.12.1 declared not met due to exceeding the specified Frequency plus the 25 percent extension allowed by SR 3.0.2 (15 hours total). Unit 2 entered TS 3.6.12, Condition A in accordance with SR 3.0.1. |
| 1258 | Conditional performance of SR 3.6.12.1 successfully completed. Unit 2 ice bed declared operable and TS 3.6.12, Condition A exited. |

- D. Manufacturer and model number of each component that failed during the event:

SQN-2-XS-061-0138B is an ice bed temperature monitoring system remote scanner manufactured by Yokogawa Corporation of America, model number 38826-232-12/NS-SR.

- E. Other systems or secondary functions affected:

There were no other systems or secondary functions affected by this event.

- F. Method of discovery of each component or system failure or procedural error:

The component failure was identified by operator walkdown.

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G. Failure mode, mechanism, and effect of each failed component:

The failure mode and mechanism of the component are unknown. The failure of the component caused the ice bed temperature monitoring system to become nonfunctional.

H. Operator actions:

Operations personnel authorized a conditional performance of 2-SI-IXX-061-138.0, Backup Ice Condenser Temperature Monitoring.

I. Automatically and manually initiated safety system responses:

There were no automatic or manually initiated safety system responses associated with this event.

III. Cause of the Event**A. Cause of each component or system failure or personnel error:**

The cause of the event was the failure of the ice bed temperature monitoring system remote scanner due to an internal power supply failure.

B. Cause(s) and circumstances for each human performance related root cause:

There was no identified human performance related root cause.

IV. Analysis of the Event:

The ice bed consists of a minimum of 1,916,000 pounds of ice stored within the ice condenser. The primary purpose of the ice bed is to provide a large heat sink in the event of a release of energy from a DBA in containment. The ice would absorb energy and limit containment peak pressure and temperature during the accident transient. Limiting the pressure and temperature reduces the release of fission product radioactivity from containment to the environment in the event of a DBA.

The Unit 2 ice bed remained below 27 degrees F and remained capable of performing its required safety function to provide a heat sink during a DBA in containment.

V. Assessment of Safety Consequences

There were no actual safety consequences as a result of the ice bed inoperability. No actual loss of safety function occurred. The ice mass required for a DBA in containment was available.

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- A. Availability of systems or components that could have performed the same function as the components and systems that failed during the event:

None.

- B. For events that occurred when the reactor was shut down, availability of systems or components needed to shutdown the reactor and maintain safe shutdown conditions, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident:

The event did not occur when the reactor was shut down.

- C. For failure that rendered a train of a safety system inoperable, an estimate of the elapsed time from discovery of the failure until the train was returned to service:

The ice bed is a single train safety system that was rendered inoperable for approximately 20 minutes.

VI. Corrective Actions

The event was entered into the Tennessee Valley Authority Corrective Action Program (CAP) under condition reports (CRs) 1709839 and 1709881.

- A. Immediate Corrective Actions:

Operations personnel authorized the conditional performance 2-SI-IXX-061-138.0, Backup Ice Condenser Temperature Monitoring, so the ice bed temperatures could be obtained.

- B. Corrective Actions to Prevent Recurrence or to reduce probability of similar events occurring in the future:

Corrective actions for this event include developing procedural guidance for the response required for a nonfunctional ice bed temperature monitoring system and replacement of obsolete instrumentation in the ice bed temperature monitoring system.

VII. Previous Similar Events at the Same Site:

LER 2-2020-001-00 was submitted for an inoperable Unit 2 ice bed. The cause of the event was the failure of a gasket on vendor supplied equipment at the flanged connection of the Auxiliary Glycol Cooling System skid. The corrective action was to repair the skid.

LER 1-2021-002-00 was submitted for an inoperable Unit 1 ice bed (although reported in 2021, the event occurred in 2018). The cause of the event was the failure of the Unit 1 ice bed temperature monitoring system temperature recorder. The corrective action was to replace the ice bed temperature monitoring system temperature recorder.



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VIII. Additional Information

There is no additional information.

IX. Commitments:

There are no commitments.