NRC FORM 366 (08-2020) U.S. NUCLEAR REGULATORY COMMISSION

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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/)

1. Facility Name	2. Docket Number	3. Page
Sequoyah Nuclear Plant Unit 1	05000327	1 OF 5

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
									NA	05000
09	26	2018	2021	- 002 -	00	09	22	2021	Facility Name: NA	Docket Number: 05000

9. Operating Mode	10. Power Level
1	100

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

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(4)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(i)(A)	☒ **50.73(a)(2)(v)(C)**	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.73(a)(2)(i)(B)	☒ **50.73(a)(2)(v)(D)**	☐ 73.77(a)(1)(i)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(iii)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.77(a)(2)(ii)
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	

☐ **Other** (Specify here, in Abstract, or in NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include Area Code)
Scott Bowman	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	TR	Y006	N					

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☒ No	☐ **Yes** (If yes, complete 15. Expected Submission Date)				

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

On September 26, 2018, at 1525 eastern daylight time (EDT), the SQN Unit 1 ice bed temperature monitoring system stopped providing accurate data for the ice bed due to the failure of a temperature recorder 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. At 2333, SR 3.6.12.1 was successfully performed; however, this exceeded the specified Frequency plus the 25 percent extension allowed by SR 3.0.2 by 32 minutes (SR 3.6.12.1 had last been completed at 0801). Therefore, the Unit 1 ice bed was declared inoperable for 32 minutes from 2301 until 2333.

The cause of the Unit 1 ice bed inoperability was the failure of the ice bed temperature monitoring system temperature recorder. The corrective action for this event was to replace the ice bed temperature monitoring system temperature recorder. This was completed via Engineering Change Package SQN-19-877 and Work Order 121519017.

NARRATIVE

I. Plant Operating Conditions Before the Event

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

II. Description of Event

A. Event Summary:

On September 26, 2018, at 1525 eastern daylight time (EDT), the SQN Unit 1 ice bed [EIIS: BC] temperature monitoring system stopped providing accurate data for the ice bed due to the failure of a temperature recorder [EIIS: TR] 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 the performance of 1-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 2333, SR 3.6.12.1 was successfully performed; however, this exceeded the specified Frequency plus the 25 percent extension allowed by SR 3.0.2 by 32 minutes (SR 3.6.12.1 had last been completed at 0801). Therefore, the Unit 1 ice bed was declared inoperable for 32 minutes from 2301 until 2333.

This event was not identified as reportable until July 30, 2021, when a similar event occurred on SQN Unit 2 (reported in Event Notification 55379). During development of lessons learned for the Unit 2 event, Operations personnel discovered the September 26, 2018, event. The failure to provide a report 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 was documented in Condition Report 1711038. 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 1 ice bed to be declared inoperable, the Unit 1 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.

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
09/26/18, 0801	SR 3.6.12.1 successfully performed.
1525	MCR operators recognized the Ice Bed Temperature Monitoring System was nonfunctional.
2301	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 1 entered TS 3.6.12, Condition A in accordance with SR 3.0.1.
2333	Conditional performance of SR 3.6.12.1 successfully completed. Unit 1 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-1-TR-061-0138 is an ice bed temperature monitoring system temperature recorder manufactured by Yokogawa Corporation of America, model number Y006/HR2500E.

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.

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 1-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 Unit 1 ice bed inoperability was the failure of the ice bed temperature monitoring system temperature recorder.

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 1 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.

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 32 minutes.

VI. Corrective Actions

The event was entered into the Tennessee Valley Authority Corrective Action Program (CAP) under condition reports (CRs) 1711038.

A. Immediate Corrective Actions:

Operations personnel authorized the conditional performance 1-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:

The corrective action for this event was to replace the ice bed temperature monitoring system temperature recorder. This was completed via Engineering Change Package (ECP) SQN-19-877 and Work Order 121519017.

VII. Previous Similar Events at the Same Site:

LER 2-2021-001-00 was submitted for an inoperable Unit 2 ice bed (It was during the review of previous similar events for Unit 2 that this Unit 1 event was discovered). The cause of the Unit 2 event was the failure of the Unit 2 ice bed temperature monitoring system remote scanner. The corrective actions for the Unit 2 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.

VIII. Additional Information

There is no additional information.

IX. Commitments:

There are no commitments.