



SVP-22-053

10 CFR 50.73

September 1, 2022

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Quad Cities Nuclear Power Station, Unit 1 and 2
Renewed Facility Operating License No. DPR-29 and DPR-30
NRC Docket No. 50-254 and 50-265

Subject: Licensee Event Report 254/2022-003-00 "Both Trains of Standby Gas Treatment Inoperable due to Blockage in the Common Discharge Line"

Enclosed is Licensee Event Report 254/2022-003-00 "Both Trains of Standby Gas Treatment Inoperable Due to Blockage in the Common Discharge Line," for Quad Cities Nuclear Power Station, Unit 1 and 2.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(v)(C) and (D) for an event or condition that could have prevented the fulfillment of a safety function needed to control the release of radioactive material and mitigate the consequences of an accident. This report is also being submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) for an operation or condition which was prohibited by the plant's Technical Specifications.

There are no regulatory commitments contained in this letter.

Should you have any questions concerning this report, please contact Mark Humphrey at (309) 227-2800.

Respectfully,

A handwritten signature in black ink, appearing to read "Brian Wake", written in a cursive style.

Brian Wake
Site Vice President
Quad Cities Nuclear Power Station

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station



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 Infocollects.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 Quad Cities Nuclear Power Station Unit 1	2. Docket Number 05000 - 254	3. Page 1 OF 5
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4. Title
Both Trains of Standby Gas Treatment Inoperable Due to Blockage in the Common Discharge Line

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
07	04	2022	2022	- 003 -	00	09	01	2022	QCNPUS Unit 2	05000-265
									Facility Name n/a	Docket Number 05000

9. Operating Mode 1 - Power Operation	10. Power Level 100%
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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 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 checked="" 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 NRC 366A).

12. Licensee Contact for this LER

Licensee Contact Rachel Luebbe	Phone Number (Include area code) 309-227-2813
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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	BH	PSX	N/A	Y	n/a				

14. Supplemental Report Expected

<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)
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15. Expected Submission Date

Month	Day	Year

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

On 7/4/22 at 0104, Unit 2 experienced a reactor scram. As a result, the 1/2 B Standby Gas Treatment (SGT) train auto started and was found to have lower than Technical Specification (TS) required flow. The 1/2 B SGT train was secured and the 1/2 A SGT train was manually started and found to have the same low flow condition. On 7/4/22 at 0130, both units entered TS 3.6.4.3 Condition D for having both SGT trains inoperable. On 7/4/22 at 0230 TS 3.6.4.3 Condition E was entered. SGT flow slowly increased with the running of the train and on 7/4/22 at 1122 the 1/2 B SGT train was declared operable, and TS 3.6.4.3 Condition E was exited.

The cause of the SGT low flow condition was water in the common SGT discharge line.

This event is being reported under 10 CFR 50.73(a)(2)(v)(C) and (D) - "Any event or condition that could have prevented the fulfillment of the 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 event is also reportable under 10 CFR 50.73(a)(2)(i)(B) - "Any operation or condition which was prohibited by the plant's Technical Specifications."



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

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Quad Cities Nuclear Power Station Unit 1	05000- 254	2022	- 003	- 00

NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

General Electric – Boiling Water Reactor, 2957 Megawatts Thermal Rated Core Power

Energy Industry Identification System (EII) codes are identified in the text as [XX].

EVENT IDENTIFICATION

Both Trains of Standby Gas Treatment Inoperable Due to Blockage in the Common Discharge line

CONDITION PRIOR TO EVENT

Unit: 1 Event Date: July 4, 2022 Event Time: 0130 CST

Reactor Mode: 1 Mode Name: Power Operation Power Level: 100%

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

A. DESCRIPTION OF EVENT

On July 4, 2022, at 0104, Unit 2 experienced a manual scram. As a result of the reactor scram, the 1/2 B train of Standby Gas Treatment (SGT)[BH] auto started; however, the train was running with degraded and oscillating flow between 2400-2600 scfm. Technical Specification 5.5.7 requires a SGT flow of 4000 cfm +/- 10%. TS 3.6.4.3 Condition A was entered on July 4, 2022, at 0127 for one SGT subsystem being inoperable. TS 3.6.4.1 Condition A was also entered for inoperable Secondary Containment because Secondary Containment vacuum was found to be less than 0.25 inches water gauge vacuum required by TS surveillance requirement (SR) 3.6.4.1.3.

On July 4, 2022, at 0130, Operations manually secured the 1/2 B SGT train and started the 1/2 A SGT train and it also indicated degraded and oscillating flow of a similar flowrate and signature to the 1/2 B SGT train. TS 3.6.4.3 Condition D was entered on July 4, 2022, at 0130 for two SGT subsystems being inoperable. Operations initiated troubleshooting efforts that identified a partial blockage in the 24 inch common discharge line [PSX] from both trains of SGT to the main chimney. The SGT flow control valves (FCV)[FCV] were also observed as being fully open, when during normal operation the FCV is partially open and controlling the flow through the train. As the SGT system continued to operate, the flowrate through the train slowly increased. On July 4, 2022, at 0230, TS 3.6.4.3 Condition E was entered for not having restored one SGT subsystem within 1 hour. Condition E requires both Unit 1 and Unit 2 to be in Mode 3 within 12 hours. Unit 2 was already in Mode 3 due to the earlier manual scram.

On July 4, 2022, at 0853 (CT), Event Notification System (ENS) notification #55976 was completed for the immediate reportability required under 10 CFR 50.72(b)(3)(v)(C) and (D) – “Any event or condition



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NARRATIVE

that could have prevented the fulfillment of the 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.”

On July 4, 2022, at 1122, the 1/2 B SGT train met the required flow rate and the 1/2 B SGT train was declared operable. TS 3.6.4.3 Condition E was exited.

On July 4, 2022, at 1212, Operations confirmed that Secondary Containment vacuum met the TS SR 3.6.4.1.3 requirement with SGT operating and Reactor Building ventilation was secured and isolated. TS 3.6.4.1 Condition A was exited.

On July 4, 2022, at 1330, the 1/2 A SGT train met the TS required flow rate and the 1/2 A SGT train was declared operable. TS 3.6.4.3 Condition A was exited. SGT continued to operate until July 8, 2022, with continued improvement in flow rates and the normal use of the SGT system’s FCV.

This event is being reported under 10 CFR 50.73(a)(2)(v)(C) and (D) – “Any event or condition that could have prevented the fulfillment of the 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 event is also reportable under 10 CFR 50.73(a)(2)(i)(B) – “Any operation or condition which was prohibited by the plant’s Technical Specifications.” TS 3.6.4.3 Condition D allows for both trains of SGT to be inoperable for 1 hour. Since the water in the common discharge line did not accumulate during a one-time event but rather resulted from a slow accumulation over time, it is assumed that both trains of SGT were inoperable since the last initiation of the system on May 26, 2022. This is greater than the 1-hour TS allowable time.

B. CAUSE OF EVENT

The cause of low flow condition on both trains of SGT was due to partial water blockage in the SGT 24 inch common discharge line. Portions of the SGT common discharge line run underground before entering the main chimney. The design of the SGT common discharge line does not currently have method of assessing or removing any accumulated water in the line itself. The source of the water intrusion into the SGT common discharge line can come from two potential sources: (1) condensation from the Main Chimney exhausts or (2) groundwater intrusion from a flaw in the wall of the buried common discharge line pipe section. Either of the identified potential sources of water would have caused a gradual buildup of water in the common discharge line.

SAFETY ANALYSIS

System Design

The SGT system consists of two fully redundant subsystems that are shared between Units 1 and 2, each with its own set of ductwork, dampers, charcoal filter train and controls. Each SGT subsystem is capable of processing the secondary containment volume, which includes both Units 1 and 2. The SGT is designed to maintain the reactor building [NH] (common to both Units 1 and 2) at a negative



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pressure and to filter the exhaust of radioactive matter from reactor building spaces to the environment in the unlikely event of a Design Basis Accident (DBA), including the Loss of Coolant Accident (LOCA) or a refueling accident. It is also instrumental in maintaining the integrity of secondary containment by producing greater than 0.25 inches water negative pressure in the reactor building while processing 4000 cfm of exhaust air. The exhaust of the SGT travels to the Main Chimney for an elevated release point, to reduce the offsite radiation doses from a postulated DBA.

The function of the secondary containment (reactor building) is to contain, dilute and hold up fission products that may leak from primary containment following a DBA. In conjunction with operation of the SGT and closure of certain valves whose lines penetrate the secondary containment, the secondary containment is designed to reduce the activity level of the fission products prior to release to the environment, and to isolate and contain fission products released during certain operations that take place inside primary containment, when primary containment is not required to be operable, or that take place outside primary containment.

Safety Impact

Since both trains of SGT had reduced flow, had a DBA of LOCA/LOOP or refueling accident occurred, the SGT would have had reduced capacity to perform its safety function to control the release of radioactive material and mitigate the consequences of an accident. During this event, the SGT system filtration capability was not lost, just reduced due to the lower flow conditions.

Secondary Containment vacuum was reduced below 0.25 inches water gauge but remained positive throughout this event. Because of this, there was no risk of a ground level release of airborne radioactive materials.

This event is considered a safety system functional failure.

C. CORRECTIVE ACTIONS

Immediate:

1. Run the SGT train until water in the common discharge line is dissipated to the point where SGT flow and flow control returns to normal. - Complete
2. Change the frequency of the SGT TS SR 3.6.4.3.1 surveillance from 184 days to 31 days. - Complete

Follow up:

1. Develop and implement a plan for locating, characterizing and resolving the source of water intrusion.
2. Create and implement Work Order's for cleaning out the chimney drains until a permanent preventive maintenance task can be implemented.

D. PREVIOUS OCCURENCES



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The station events database, LERs and INPO Industry Reporting Information System (ISIS) were reviewed for similar events at Quad Cities Nuclear Power Station. This event was caused by water in the SGT common discharge line. Based on the condition of this event, cause and associated corrective actions, two events described below has been found to have a similar condition.

- LER 254-2019-003-00 (12/20/2019) Water Found in Control Room Emergency Ventilation Air Filtration Unit. This LER also involved water found in a safety-related air system rendering the system inoperable. The source of the water was a leaking fire protection valve into the air filtration unit. The cause of this event was determined to be inadequate technical human performance in the preparation and review of work instructions which is different than the cause of SGT low flow event; however, the condition is similar.
- Issue Report (IR) 1016562 (1/14/2010) Actions Recommended to Address the Water in the Chimney. This issue report identifies chimney drains that are clogged and that the chimney water depth is estimated to be above the SGT common discharge line and may cause water intrusion into that line. The work order generated from this issue report is still incomplete.

E. COMPONENT FAILURE DATA

Failed Equipment: 0-7509A-24" common discharge line
 Component Manufacturer: unknown
 Component Model Number: unknown
 Component Part Number: unknown

This event will be reported to IRIS.