



SVP-23-059

10 CFR 50.73

November 30, 2023

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

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

Subject: Licensee Event Report Revision 265/2023-001-01 "Turbine Trip and Automatic Reactor Scram due to High Moisture Separator Level"

Enclosed is Licensee Event Report Revision 265/2023-001-01 "Turbine Trip and Automatic Reactor Scram due to High Moisture Separator Level," for Quad Cities Nuclear Power Station, Unit 2.

This revised report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A) for an event or condition that resulted in manual or automatic actuation of the reactor protection system including a reactor scram.

There are no regulatory commitments contained in this letter.

Should you have any questions concerning this revised report, please contact Rachel Luebke at (309) 227-2813.

Respectfully,

A handwritten signature in black ink, appearing to read "Brian Wake" followed by a small flourish.

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

NRC FORM 366 (10-01-2023)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104		EXPIRES: 03/31/2024												
<div style="display: flex; justify-content: space-between; align-items: center;"><div>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/)</div></div>										<div>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 email to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: 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.</div>									
1. Facility Name Quad Cities Nuclear Generating Station Unit 2					<input checked="" type="checkbox"/> 050 <input type="checkbox"/> 052		2. Docket Number 05000-265		3. Page 1 OF 4										
4. Title Turbine Trip and Automatic Reactor Scram due to High Moisture Separator Level																			
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		<input type="checkbox"/> 050	Docket Number							
08	11	2023	2023	- 001 -	01	11	30	2023	Facility Name		<input type="checkbox"/> 052	Docket Number							
9. Operating Mode 1 – Power Operation						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)		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"/> 73.1200(a)									
<input type="checkbox"/> 20.2201(b)		<input type="checkbox"/> 20.2203(a)(3)(i)		<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"/> 73.1200(b)									
<input type="checkbox"/> 20.2201(d)		<input type="checkbox"/> 20.2203(a)(3)(ii)		<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)		<input type="checkbox"/> 73.1200(c)									
<input type="checkbox"/> 20.2203(a)(1)		<input type="checkbox"/> 20.2203(a)(4)		<input type="checkbox"/> 50.36(c)(2)		<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)		<input type="checkbox"/> 50.73(a)(2)(x)		<input type="checkbox"/> 73.1200(d)									
<input type="checkbox"/> 20.2203(a)(2)(i)		10 CFR Part 21		<input type="checkbox"/> 50.46(a)(3)(ii)		<input type="checkbox"/> 50.73(a)(2)(v)(A)		10 CFR Part 73		<input type="checkbox"/> 73.1200(e)									
<input type="checkbox"/> 20.2203(a)(2)(ii)		<input type="checkbox"/> 21.2(c)		<input type="checkbox"/> 50.69(g)		<input type="checkbox"/> 50.73(a)(2)(v)(B)		<input type="checkbox"/> 73.77(a)(1)		<input type="checkbox"/> 73.1200(f)									
<input type="checkbox"/> 20.2203(a)(2)(iii)				<input type="checkbox"/> 50.73(a)(2)(i)(A)		<input type="checkbox"/> 50.73(a)(2)(v)(C)		<input type="checkbox"/> 73.77(a)(2)(i)		<input type="checkbox"/> 73.1200(g)									
<input type="checkbox"/> 20.2203(a)(2)(iv)				<input type="checkbox"/> 50.73(a)(2)(i)(B)		<input type="checkbox"/> 50.73(a)(2)(v)(D)		<input type="checkbox"/> 73.77(a)(2)(ii)		<input type="checkbox"/> 73.1200(h)									
<input type="checkbox"/> 20.2203(a)(2)(v)				<input type="checkbox"/> 50.73(a)(2)(i)(C)		<input type="checkbox"/> 50.73(a)(2)(vii)													
<input type="checkbox"/> OTHER (Specify here, in abstract, or NRC 366A).																			
12. Licensee Contact for this LER																			
Licensee Contact Erin Whitsell, Senior Regulatory Engineer										Phone Number (Include area code) 309-227-2828									
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										
A	SN	LC	F130	Y	n/a														
14. Supplemental Report Expected										15. Expected Submission Date									
<input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)								Month	Day	Year							
16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines) On August 11, 2023, at 0329, Quad Cities Unit 2 had an automatic scram from full power due to a trip of the main turbine. A fault in the Essential Service System (ESS) caused a feedwater heater (FWH) system transient. The drain valve for the 2A Moisture Separator Drain Tank (MSDT) did not open rapidly enough to prevent water level in the moisture separators from reaching the established turbine trip setpoints. The Unit 2 Main Turbine tripped as designed and generated an automatic reactor scram. All control rods inserted and the scram was uncomplicated. Containment isolation valves actuated closed in multiple systems on a valid Group II signal. The cause of the event is an improperly tuned Level Controller for the 2A MSDT allowing the high level turbine trip to be reached following a FWH transient. Completed corrective action was a component recalibration. Planned actions are procedure changes and training. This report is being submitted per 10 CFR 50.73(a)(2)(iv)(A) for an event that resulted in manual or automatic actuation of the reactor protection system including a reactor scram.																			

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

(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 email to Infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: 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 Generating Station Unit 2	<input checked="" type="checkbox"/> 050	2. DOCKET NUMBER 05000-265	3. LER NUMBER				
	<input type="checkbox"/> 052		<table border="1"><thead><tr><th>YEAR</th><th>SEQUENTIAL NUMBER</th><th>REV NO.</th></tr></thead><tbody><tr><td>2023</td><td>- 001</td><td>- 01</td></tr></tbody></table>	YEAR	SEQUENTIAL NUMBER	REV NO.	2023
YEAR	SEQUENTIAL NUMBER	REV NO.					
2023	- 001	- 01					

NARRATIVE**PLANT AND SYSTEM IDENTIFICATION**

General Electric – Boiling Water Reactor, 2957 Megawatts Thermal Rated Core Power
Energy Industry Identification System (EIS) codes are identified in text as [XX].

EVENT IDENTIFICATION

Turbine Trip and Automatic Reactor Scram due to High Moisture Separator Level

CONDITION PRIOR TO EVENT

Unit: 2 Event Date: August 11, 2023 Event Time: 0329 CDT

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

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

A. DESCRIPTION OF EVENT

On August 11th, 2023, at 0329, Quad Cities Unit 2 had an automatic scram from full power due to a trip of the main turbine [TRB]. A fault in the Essential Service System (ESS)[UJX] caused a feedwater heater (FWH)[HX] system transient. The drain valve [LC] for the 2A Moisture Separator Drain Tank (MSDT)[SN][TK] did not open rapidly enough to prevent water level in the moisture separators [MSR] from reaching the established turbine trip setpoints. The Unit 2 Main Turbine tripped as designed and generated an automatic reactor scram. All control rods were inserted and the scram was uncomplicated. Containment isolation valves actuated closed in multiple systems on a valid Group II signal.

B. CAUSES OF EVENT

The cause of the scram was an improperly tuned emergency level control valve (LCV) for a MSDT. Tuning was performed by a utility technician based on knowledge of the component and their understanding of plant response without adequate work instructions. There was no evidence of time pressure during this evolution. The controller's [LCO] setpoints were configured to provide a slower response than was appropriate for responding to a FWH level transient. In this case, the valve did not respond rapidly enough to prevent overfilling the associated MSDT and eventually tripping the turbine on high level in the moisture separators.

C. SAFETY ANALYSIS**SYSTEM DESIGN**

Moisture Separator Drain Tank Level Controller

High pressure turbine exhaust steam is routed to four moisture separators prior to entering the low-pressure turbines. Steam passes through chevron separator elements to remove water droplets which drain to two MSDTs. On a High Level in the MSDT, the MSDT emergency drain valve opens and the normal MSDT LCV



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	<input type="checkbox"/> 052		YEAR 2023	SEQUENTIAL NUMBER - 001	REV NO. - 01

NARRATIVE

remains open. On loss of power from ESS, the normal MSDT LCV fails closed and level is maintained by the emergency drain valve.

SAFETY ANALYSIS

There were no safety consequences as a result of this event. The operators performed all actions in accordance with the procedures and training. An Automatic scram occurred without complications due to a turbine trip caused by moisture separator high level. All expected ESF actuations occurred as designed to bring the reactor to a safe shutdown condition. Adequate makeup to the vessel was available at all times from the feedwater system, as well as from the ECCS systems. The event was within the analysis of the UFSAR Chapter 15, UFSAR Chapter 6, and there were no radioactive releases. Off-site power was maintained on both Units supplying power to the 4 kV safety busses. The Emergency Diesel Generators (EDG) were available if required. Unit 1 was not affected by the Unit 2 scram.

This is not a Safety System Functional Failure per NEI 99-02, Revision 7.

D. CORRECTIVE ACTIONS

Immediate:

1. Tuned the emergency MSDT LCV to ensure appropriate transient response (Complete)

Follow Up:

1. Implement procedure change to provide additional direction for MSDT LCV tuning at all power levels.
2. Implement training on the requirements regarding the acceptable situations in which maintenance activities can be conducted without a set of written instructions.

E. PREVIOUS OCCURRENCES

The station events database, LERs, and INPO Industry Reporting Information System (IRIS) were reviewed for similar events at Quad Cities Nuclear Power Station in the last three years. A similar event had occurred on 2/26/2020, in which a failure of a component in the Unit 2 ESS UPS had resulted in a FWH level transient (reference IR 4321603). This event differed from the more recent event on 8/11/2023, in that the emergency LCVs functioned appropriately to control level in the FWH system. This ESS UPS component failure factored into the decision to replace/upgrade the ESS UPS systems on both Unit 1 and Unit 2 at Quad Cities Nuclear Generating Station. This upgrade was installed on Unit 1 in 2023 during the refuel outage and is scheduled for installation on Unit 2 during the 2024 refueling outage.

No other relevant events were identified during the previous 3-year history.



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NARRATIVE

F. COMPONENT FAILURE DATA

Level Controller
Manufacturer: Fisher Controllers
Supplier: Fisher Controllers
Nomenclature: Pneumatic Controller
Model/Part Number: 4195KB