



April 30, 2018

10 CFR 50.73

SVP-18-033

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

Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Licensee Event Report 254/2018-002-000 "Tornado Missile Protection
Non-Conformance in Association with EGM 15-002"

Enclosed is Licensee Event Report (LER) 254/2018-002-00, "Tornado Missile Protection
Non-Conformance in Association with EGM 15-002," for Quad Cities Nuclear Power Station,
Unit 1 and 2.

This report is submitted in accordance with the following:

- 10 CFR 50.73(a)(2)(i)(B) for operation or condition prohibited by Technical Specifications,
- 10 CFR 50.73(a)(2)(ii)(B) for a condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety,
- 10 CFR 50.73(a)(2)(v)(D) for a condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident, and
- 10 CFR 50.73(a)(2)(vii) for an event where a single cause or condition causes two independent trains or channels to become inoperable in a single system designed to mitigate the consequences of an accident.

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 "K. Ohr".

Kenneth S. Ohr
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 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/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. Facility Name Quad Cities Nuclear Power Station Unit 1	2. Docket Number 05000254	3. Page 1 OF 4
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4. Title
Tornado Missile Protection Non-Conformance in Association with EGM 15-002

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
03	01	2018	2018	002	- 00	04	30	2018	Quad Cities Nuclear Power Station Unit 2	05000265
									Facility Name	Docket Number
									N/A	N/A

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)			
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
10. Power Level	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
100	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(iii)
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)	

12. Licensee Contact for this LER

Licensee Contact Richard Swart – Regulatory Assurance	Telephone Number (Include Area Code) (309) 227-2810
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13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. Supplemental Report Expected	15. Expected Submission Date		
<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No	Month	Day	Year
	N/A	N/A	N/A

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On March 1, 2018, Quad Cities Nuclear Power Station (QCNPS) conservatively identified a non-conforming condition with the three Emergency Diesel Generators (EDG) intake stacks, exhaust stacks, and related fuel oil tank vents, with respect to tornado missile protection. Compensatory measures were implemented and verified in accordance with the NRC Enforcement Guidance Memorandum (EGM) 15-002, "Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance," and DSS-ISG-2016-01, Revision 1, "Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance." All three EDGs were returned to operable but non-conforming status in accordance with EGM 15-002 and DSS-ISG-2016-01 guidance, and an eight-hour Event Notification was made to the NRC. This condition is reportable under multiple reporting criteria in accordance with 10CFR50.73 requirements indicated above. This condition is a legacy issue that has existed since the original licensing of the plant. Due to the historic nature of this issue, a specific cause of the identified vulnerabilities was not determined. No actual consequences resulted from the nonconforming condition.



**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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Quad Cities Nuclear Station Unit 1	05000254	2018	- 002	- 00

NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

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

Emergency Onsite Power Supply System [EK], Emergency Diesel Generators [DG], and Fuel Oil Storage and Transfer System [DE]

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

EVENT IDENTIFICATION

During a systematic review of the plant protection for tornado generated missiles the Unit 1, 2, and Common Emergency Diesel Generators [DG](EDG) were identified as non-conforming to the station Licensing Basis.

A. CONDITION PRIOR TO EVENT

Unit: 1 Event Date: March 1, 2018 Event Time: 1210 hours
Reactor Mode: 1 Mode Name: Power Operation Power Level: 100%

There were no structures, systems, or components (SSCs) out of service or inoperable that contributed to the event.

B. DESCRIPTION OF EVENT

In response to Regulatory Issue Summary (RIS) 2015-06 Quad Cities Nuclear Power Station (QCNPS) reevaluated tornado missile protection under the Enforcement Guidance Memorandum (EGM) 15-002 to insure compliance with the Current Licensing Basis (CLB). The QCNPS CLB requires protection against the effects of single bounding tornado generated missile impacts. Protection against multiple missiles outside the Power Block is not part of the QCNPS CLB. The EDGs [DG] have intake and exhaust piping, and fuel storage [DE] tank vents that are located outside the protection of concrete structures. The potential crimping of these lines from missile impact could prevent the associated Diesel Generator from performing its safety function. Although not described in the CLB, a multiple missile event could prevent redundant EDGs from performing their required safety functions. Therefore, it was conservatively decided to report the EDGs as non-conforming.

On March 1, 2018, at 1210 hours, the Unit 1, 2 and Common Emergency Diesel Generators [DG] were declared inoperable. Compensatory actions in accordance with EGM 15-002 guidance were implemented to return the equipment to operable but non-conforming status. On March 1, 2018, at 1243 hours, ENS #53235 was made to the NRC.

This event is reportable as a licensee event report (LER) in accordance with the following:

- 10 CFR 50.73(a)(2)(i)(B) for operation or condition prohibited by TS, since the design deficiency (i.e., non-conforming condition) existed for a time longer than permitted by TS,
- 10 CFR 50.73(a)(2)(ii)(B) for a condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety,
- 10 CFR 50.73(a)(2)(v)(D) for a condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident, and
- 10 CFR 50.73(a)(2)(vii) for an event where a single cause or condition causes two independent trains or channels to become inoperable in a single system designed to mitigate the consequences of an accident.



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Quad Cities Nuclear Station Unit 1	05000254	2018	- 002	- 00

NARRATIVE

C. CAUSE OF EVENT

The cause of the non-conforming conditions is a legacy design issue that was identified as part of the response to RIS 2015-06. These conditions were part of the original plant design and have existed since the initial construction and licensing of the plant.

D. SAFETY ANALYSIS

No actual safety consequence resulted from the identified non-conforming condition since QCNPS has not experienced an on-site tornado missile event in the past three years, and no equipment damage has taken place.

QCNPS licensing bases for tornados and tornado generated missiles are summarized in original plant licensing documents, including these requirements:

- The tornado has a tangential velocity of 300 mph and a translational velocity of 60 mph.
- The tornado causes a pressure change of three pounds per square inch at the vortex in three seconds.
- One evaluated missile type is a utility pole 50 feet 0 inches long with a butt diameter of 13 inches and a unit weight of fifty pounds per cubic foot, with a velocity of 150 mph.
- The second evaluated missile type is a 1-ton mass with a contact area of 25 square feet and a velocity of 100 mph.

NRC EGM 15-002, Revision 1, provides for application of NRC enforcement discretion which allows the identified non-conforming conditions to be returned to an operable status based on the application of compensatory measures which are intended to reduce the likelihood that the tornado event would result in a failure of any of the identified non-conforming conditions. QCNPS applied the guidance in EGM 15-002, Revision 1, and NRC DSS-ISG-2016-01 Appendix A, Revision 1, to determine the acceptable initial and comprehensive compensatory measures necessary to ensure that the identified non-conforming conditions could be treated by the NRC with enforcement discretion.

An engineering analysis demonstrated this event did not constitute a Safety System Functional Failure (SSFF). (Reference NEI 99-02, Revision 7, Regulatory Assessment Performance Indicator Guideline, Section 2.2, Mitigating Systems Cornerstone, Safety System Functional Failures, Clarifying Notes, Engineering analyses.) As such, this event will not be reported in the NRC Performance Indicator (PI) for safety system functional failures.



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NARRATIVE

E. CORRECTIVE ACTIONS

Compensatory measures were implemented in accordance with NRC guidance contained in EGM 15-002 Revision 1 and DSS-ISG-2016-01 Revision 1. Enforcement discretion provided by EGM 15-002 remains in effect until June 20, 2018. QCNPS letter dated March 23, 2018, to the NRC requested extension of this enforcement discretion to June 10, 2020, at which time modifications, license amendments, or other actions must be implemented to fully resolve the issue.

F. PREVIOUS OCCURRENCES

No previous similar events have occurred at the site based on a search of station LERs and IRs.

G. COMPONENT FAILURE DATA

No component failures were identified.