



Exelon Generation®

Three Mile Island Unit 1
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10 CFR 50.73

February 5, 2017

TMI-18-010

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1)
RENEWED FACILITY OPERATING LICENSE NO. DPR-50
DOCKET NO. 50-289

SUBJECT: LICENSEE EVENT REPORT (LER) NO. 2017-004-00
"Items Nonconforming to Design For Tornado Missile Protection"

This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B), 10 CFR 50.73(a)(2)(ii)(B), 10 CFR 50.73(a)(2)(v)(D) and 10 CFR 50.73(a)(2)(vii)(D). For additional information regarding this Licensee Event Report contact Michael Fitzwater, Sr. Regulatory Engineer, TMI Unit 1 Regulatory Assurance at (717) 948-8228.

There are no regulatory commitments contained in this LER.

Respectively,

E. W. Callan, Jr.
Site Vice President, Three Mile Island Unit 1
Exelon Generation Co., LLC

cc: NRC Senior Resident Inspector – Three Mile Island Nuclear Station, Unit 1
Regional Administrator – NRC Region I
NRC Project Manager – Three Mile Island Nuclear Station, Unit 1
R. R. Janati – Bureau of Radiation Protection, Commonwealth of Pennsylvania

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NRR

**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

Three Mile Island Unit 1

2. DOCKET NUMBER

05000289

3. PAGE

1 OF 4

4. TITLE

Items Nonconforming to Design for Tornado Missile Protection

5. EVENT DATE

MONTH	DAY	YEAR
12	06	17

6. LER NUMBER

YEAR	SEQUENTIAL NUMBER	REV NO.
2017	004	00

7. REPORT DATE

MONTH	DAY	YEAR
02	05	18

8. OTHER FACILITIES INVOLVED

FACILITY NAME	DOCKET NUMBER
	05000

9. OPERATING MODE**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)**

NO

<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

100

<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)
<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)(i)
<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)(ii)
	<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**

Michael Fitzwater – TMI Unit 1 Regulatory Assurance Engineer

TELEPHONE NUMBER (Include Area Code)

717-948-8228

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On December 6, 2017 Three Mile Island Unit 1, determined that both Emergency Diesel Generators do not conform with the licensing bases for protection against tornado generated missiles. The vent on the common Fuel Oil Supply Tank that serves both Emergency Diesel Generators could be damaged by debris generated from a tornado that could affect emergency diesel generator operation. An extent of condition review identified three additional items that are nonconforming to the design for tornado missile protection: vent stacks for each Emergency Diesel Generator Day Fuel Tanks, the Borated Water Storage Tank and steam piping near the main feed pumps that could affect Secondary Pressure Control. Upon determination of the initial nonconformance for the Fuel Oil Supply Tank Vent on December 6, 2017, both Emergency Diesel Generators were declared inoperable. Compensatory measures were put and verified in place in accordance with the NRC Enforcement Guidance Memorandum EGM 15-002, both emergency diesel generators were returned to an operable but nonconforming status and an 8 hour ENS Notification was made to the NRC. This condition has been in existence since original licensing of the plant. It is not known if it was overlooked or considered acceptable at the time of the original licensing process. There are no actual consequences as a result of the nonconforming conditions.

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

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		YEAR	SEQUENTIAL NUMBER	REV NO.
Three Mile Island Unit 1	05000289	2017	- 004	- 00

NARRATIVE**A. EVENT DESCRIPTION**

Plant Conditions before the event:

Babcock & Wilcox – Pressurized Water Reactor – 2568 MWth Core Power

Date/Time: December 6, 2017 / 09:58 EST

Power Level: 100%

Mode: Power Operation

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

On December 6, 2017, the plant was operating at steady state full power operation. TMI-1 was concluding a systematic review of the plant protection for tornado generated missiles against the plant design and licensing basis. It was determined that a non-conforming condition exists with the Emergency Diesel Generator (EDG) Fuel Supply Tank Vent Stack with respect to tornado missile protection. Since the fuel oil supply tank and vent stack is a common integral component of the EDG's and is not protected against tornado missiles, the design does not meet the licensing basis and a non-conforming condition exists.

TMI-1 entered this condition into the corrective action program and notified the NRC via Event Notification 53106 on December 6, 2017.

The extent of condition review identified three additional non-conforming conditions: Vent Stacks for each Emergency Diesel Generator Day Fuel Tanks, the Borated Water Storage Tank and steam piping near the main feed pumps that could affect Secondary Pressure Control. This concluded the TMI-1 evaluation of plant protection for tornado generated missiles against the plant design and licensing basis which results in the reporting of this event as a total of four (4) non-conforming conditions.

The event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications; 10 CFR 50.73(a)(2)(ii)(B) as an event or 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) as an event or 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; 10 CFR 50.73(a)(2)(vii)(D) for any event where a single cause or condition caused at least two independent trains to become inoperable in a single system designed to mitigate the consequences of an accident.

B. CAUSE OF EVENT

These conditions were part of the original plant design and have existed since the initial construction and licensing of the plant. TMI-1 received its operating license on September 19, 1974, based in part on the design as described in the Final Safety Analysis Report (FSAR). The NRC (at that time the Atomic Energy Commission, AEC) issued its safety evaluation for TMI-1 on July 11, 1973. It is not known whether these

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recently identified non-conforming SSCs were considered acceptable due to the low likelihood of damage to the SSCs from tornado-generated missiles during the time of the original design and licensing process.

TMI-1 identified four SSCs as non-conforming conditions to the plant design and licensing basis because of and in concert with a collective industry effort to address the NRC issuance of Regulatory Issue Summary 2015-06 "Tornado Missile Protection".

C. ANALYSIS / SAFETY SIGNIFICANCE

There were no actual consequences resulting from these identified non-conforming conditions. A tornado that could produce the design basis missile is highly unlikely in the mid-Atlantic region. The probability of missiles striking any one of the identified non-conforming SSCs in a fashion to render the SSC inoperable is also very low.

The TMI-1 FSAR described characteristics of the design basis tornado (DBT) wind hazard and tornado generated missile hazard, design requirements are stated as:

- Tangential wind velocity of 300 mph. (A gust factor of 1.3 has been used for those structures designed for tornado loadings.)
- An external vacuum of 3 psig.
- Missile equivalent to a utility pole 35 foot long, 14 inches in diameter, weighing 50 pounds per cubic foot, and traveling at 150 mph.
- Missile equivalent to a 1 ton automobile traveling at grade at 150 mph.

TMI-1 reviewed these requirements against the plant SSCs needed to achieve safe shutdown in the event of a tornado. The result was the identification of four non-conforming conditions described in the event description which were declared inoperable.

NRC Enforcement Guidance Memorandum EGM 15-002, Revision 1, provides for application of NRC enforcement discretion which allows the four 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 one of the identified non-conforming conditions. TMI-1 applied the guidance in EGM 15-002, Revision 1, and, NRC DSS-ISG-2016-01 Revision 1 Appendix A, to determine the acceptable initial and comprehensive compensatory measures necessary to ensure that the identified nonconforming condition could be treated by the NRC with enforcement discretion.

D. CORRECTIVE ACTIONS

Compensatory measures were implemented in accordance with NRC guidance contained in the EGM 15-002 (revision 1) and DSS-ISG-2016-01 (revision 1) as described earlier. Enforcement discretion provided by EGM 15-002 remains in effect until June 10, 2020, for TMI-1, at which time modifications, license amendments or other actions must be implemented to fully resolve the issue. TMI-1 intends to request a



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license amendment to allow for probabilistic methods to be applied to demonstrate that the risk associated with tornado generated missiles on specific components is sufficiently small such that plant modifications are not warranted.

E. PREVIOUS OCCURENCES

No previous similar events have occurred at the site.