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February 2, 2017

Docket Nos.: 50-348
50-364

NL-17-0009

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

Joseph M. Farley Nuclear Plant – Units 1 and 2
Licensee Event Report 2016-009-00
Tornado Missile Vulnerabilities Result in Condition Prohibited by Technical Specifications

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(i)(B), 10 CFR 50.732(a)(2)(v)(D), and 10 CFR 50.73(a)(2)(ii)(B), Southern Nuclear Company is submitting the enclosed Licensee Event Report for Units 1 and 2.

This letter contains no NRC commitments. If you have any questions regarding the submittal, please contact Ms. Julie Collier at (334) 814-4639.

Respectively submitted,

Mr. D. R. Madison
Vice President – Farley

DRM/JAC

Enclosure: Units 1 and 2 Licensee Event Report 2016-009-00

cc: Southern Nuclear Operating Company
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Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
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Joseph M. Farley Nuclear Plant – Units 1 and 2

Licensee Event Report 2016-009-00

Tornado Missile Vulnerabilities Result in Condition Prohibited by Technical Specifications

NRC FORM 366 (11-2015) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2018

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, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet 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.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET NUMBER		3. PAGE
Joseph M. Farley Nuclear Plant, Unit 1	05000 -	348	1 of 4

4. TITLE

Tornado Missile Vulnerabilities Result in Condition Prohibited by Technical Specifications

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
12	7	2016	2016	- 009 -	00	2	2	2017	Joseph M. Farley Nuclear Plant Unit 2	05000-364
									FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

1

10. POWER LEVEL

100

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

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☒ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☒ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
☐ 20 2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
	☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Julie Collier, Licensing Engineer	334-814-4639

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					

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 12/7/16 Units 1 and 2 were in Mode 1 at 100 percent rated thermal power. Engineering personnel determined that the Unit 1 and Unit 2 Service Water Intake Structure (SWIS) intake and exhaust ventilation hoods were not adequately protected from tornado generated missiles. Subsequent evaluations on 1/26/17 resulted in the determination that the emergency diesel generator (EDG) fuel oil storage tank (FOST) vents were also not adequately protected from tornado generated missiles. Operations subsequently declared the affected systems inoperable, implemented Enforcement Guidance Memorandum (EGM) 15-002, "Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance" and the required compensatory measures, and then declared the affected equipment operable but non-conforming.

This condition is an original plant design legacy issue. Immediate compensatory measures included actions to take if needed as described in severe weather procedures, and monitoring of system parameters on the MCB in accordance with annunciator response procedures. A risk based evaluation will be performed or plant modifications will be undertaken to establish compliance with the site's tornado missile protection design basis.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Joseph M. Farley Nuclear Plant, Unit 1	05000- 348	2016	- 009 -	00

NARRATIVE

PLANT AND SYSTEM IDENTIFICATION
Westinghouse - Pressurized Water Reactor

A. UNIT STATUS AT TIME OF EVENT

Unit 1, Mode 1, 100 percent power
Unit 2, Mode 1, 100 percent power
No plant transients were associated with this event. Thus, no structures, systems, or components (SSC) were inoperable at the start of this event which contributed to this condition.

Background NRC documents:

Enforcement Guidance Memorandum (EGM) 15-002, "Enforcement Discretion for Tornado-Generated Missile Protection Noncompliance," provides guidance to exercise enforcement discretion when an operating power reactor licensee does not comply with a plant's current site-specific licensing basis for tornado-generated missile protection. Specifically, discretion would apply to the applicable Technical Specification (TS) Limiting Condition(s) for Operation (LCO) that would require a reactor shutdown or mode change in the event a licensee could not meet TS LCO required action(s) within the TS completion time.

Interim Staff Guidance DSS-ISG-2016-01, "Clarification of Licensee Actions in Receipt of Enforcement Discretion Per Enforcement Guidance Memorandum EGM 15-002," provides interim staff guidance to facilitate staff understanding of expectations for consistent oversight associated with implementing enforcement discretion for tornado missile protection noncompliance(s) per EGM 15-002.

Appendix A to DSS-ISG-2016-01 provides guidance for acceptable initial and comprehensive compensatory measures for licensee use in implementing the enforcement discretion outlined in EGM 15-002. The licensee should declare (log) the utilization of EGM 15-002, inform the resident inspector, and enter the issue into the corrective action program. For initial compensatory measures, it is expected that the measures listed are already in place at sites that may be affected by severe weather, such as tornados and/or hurricane force winds. The measures should be verified as current and readily deployable within a very short timeframe.

B. DESCRIPTION OF EVENT

On 12/7/16 during the evaluation of protection of Technical Specification (TS) equipment from damage from tornado generated missiles, Farley site engineering identified nonconforming conditions in the plant design such that the specified TS equipment did not meet the current design basis for protection against tornado generated missile impacts. Specifically, the Unit 1 and Unit 2 Service Water (SW) [BI] pumps could be rendered inoperable due to a tornado generated missile strike on the Service Water Intake Structure (SWIS) intake and exhaust ventilation hoods. This vulnerability was not included in the site's tornado missile risk analysis (TORMIS).

The SWIS intake and exhaust ventilation hoods, located on the roof of the SWIS, could be crimped as a result of a tornado missile strike, thus reducing air flow and challenging the performance of their heating and cooling safety functions. In addition, if the SWIS ventilation hoods were damaged or removed by a tornado missile strike, rainwater may enter the area below the hoods. The SWIS batteries and breakers

for the 1C and 2C SW pump motors could be rendered inoperable due electrical shorts caused by intrusion of rainwater.

Subsequent evaluations on 1/26/17 resulted in the determination that the emergency diesel generator (EDG) fuel oil storage tank (FOST) [DC] vents were also not adequately protected from tornado generated missiles. Each EDG FOST is provided with a 1-inch vent pipe that extends above the ground and is exposed to tornado missiles. If these vent pipes were hit by a tornado missile they could become crimped and impede the transfer of fuel oil thereby resulting in failure of the associated EDGs to perform their safety functions.

These SSCs were declared inoperable and EGM 15-002 was invoked. To meet the intent of EGM 15-002 to restore the SW Pumps to an operable but degraded / non-conforming (OBDN) status, existing measures were verified as current and readily deployable for both units and were implemented as initial compensatory measures within the allowed time by the applicable LCOs. These measures included actions to take if needed as described in severe weather procedures, and monitoring of system parameters on the MCB in accordance with annunciator response procedures. In addition, new Compensatory Measures were established to inspect, protect, and restore function to the ventilation hoods and affected areas in the SWIS, and similar measures are being established for the FOST vent pipes.

C. CAUSE OF EVENT

This condition is an original plant design legacy issue. Due to the historical nature of this vulnerability, a specific cause has not been identified.

D. REPORTABILITY ANALYSIS AND SAFETY ASSESSMENT

This event is reportable as required by:

- 10 CFR 50.73(a)(2)(i)(B) for a condition that is prohibited by Technical Specifications.
- 10 CFR 50.73(a)(2)(v)(D) for a condition that at the time of discovery could have prevented the fulfillment of a safety function of structures or systems needed to mitigate the consequences of an accident.
- 10 CFR 50.73(a)(2)(ii)(B) for an event or condition that results in the plant being in an unanalyzed condition that significantly degrades plant safety.

As documented in EGM 15-002, tornado missile scenarios that may lead to core damage are very low probability events because safety-related SSCs are typically designed to withstand effects of tornados. For a tornado missile-induced scenario to occur, a tornado would have to hit the site and result in the generation of missiles that would hit and fail vulnerable, unprotected safety-related equipment, and/or unprotected safety-related subcomponents in a manner that is non-repairable and non-recoverable. In addition, because plants are designed with redundancy and diversity, the tornado missiles would have to affect multiple trains of safety systems and/or means of achieving safe shutdown.

The NRC has completed a generic risk analysis of potential tornado missile protection noncompliances to examine the risk significance of these scenarios. This assessment documents a conservative, bounding-type analysis of the risk significance for plant facilities. The generic analysis assumed that core damage would occur if a tornado hit a plant located in the most active tornado region in the country and

that it caused a tornado-generated missile to fail all emergency core cooling equipment at the plant with no ability to recover. Given this conservative assumption, the staff's study established that the core damage frequency (CDF) associated with tornado missile-related noncompliances are well below CDFs requiring immediate regulatory action. In summary, the generic bounding risk analysis performed by the NRC concluded that this issue is of low risk significance.

During a postulated design basis tornado, the conditions documented could have resulted in a loss of function for the SW pumps or a loss of the safety function for the EDGs. The SW pumps mitigate the effects of postulated accidents by providing essential plant cooling to safety related systems and components, including those required for emergency core cooling. The EDGs are used to mitigate the effects of a loss of offsite power by providing an emergency AC power source. This condition had no actual safety consequences impacting plant or public safety as Farley did not experience an actual tornado missile event. Compensatory measures were and continue to be in place to mitigate the effects of a tornado missile strike. Also, only three of six exhaust ventilator fans are required to handle the heating load of the pump room. This redundancy reduces the risk of the postulated conditions from occurring during a tornado missile event. Therefore, enforcement discretion until June 10, 2018, will not impose significant additional risk to public health and safety.

E. CORRECTIVE ACTION

A risk based evaluation will be performed or a plant modification will be undertaken to establish compliance with the site's tornado missile protection design basis.

F. ADDITIONAL INFORMATION

1) Previous Similar Events: No other similar previous events have been reported.

2) Commitment Information: This report does not create any licensing commitments.