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1CAN051604

10CFR 50.73

May 18, 2016

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

Subject: Licensee Event Report 50-313/2016-001-00
Arkansas Nuclear One, Unit 1
Docket No. 50-313
License No. DPR-51

Dear Sir or Madam:

Pursuant to the reporting requirements of 10 CFR 50.73, attached is the subject Licensee Event Report entitled, "Non-Functional External Penetration Flood Seals."

There are no new commitments contained in this submittal.

Should you have any questions concerning this issue, please contact Stephenie Pyle at 479-858-4704.

Sincerely,

ORIGINAL SIGNED BY TERRY A. EVANS FOR JEREMY G. BROWNING

JGB/dbb

Attachment: Licensee Event Report 50-313/2016-001-00

cc: Mr. Marc L. Dapas
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
1600 East Lamar Boulevard
Arlington, TX 76011-4511

NRC Senior Resident Inspector
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LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of
digits/characters for each block)

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 Infocollections.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

Arkansas Nuclear One, Unit 1

2. DOCKET NUMBER

05000313

3. PAGE

1 OF 5

4. TITLE

Non-Functional External Penetration Flood Seals

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	19	2016	2016	- 001	- 00	05	18	2016	Arkansas Nuclear One, Unit 2	05000368
									N/A	05000

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 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 checked="" 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 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 type="checkbox"/> 50.73(a)(2)(i)(B)	<input 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

Stephenie L. Pyle, Manager, Regulatory Assurance

TELEPHONE NUMBER (Include Area Code)

479-858-4704

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

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE)☒ NO15. EXPECTED
SUBMISSION
DATE

MONTH	DAY	YEAR
N/A	N/A	N/A

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

On March 19, 2016, two block-out penetrations separating the Arkansas Nuclear One, Unit 1 (ANO-1) Turbine Building from the Auxiliary Building were determined to be non-functional. The penetrations are located in the floor of Turbine Building elevation 354 ft. Below the penetrations is the Auxiliary Building, housing safety related equipment.

On March 17, 2016, it was identified that two penetration seals did not match approved fire penetration or approved flood seal details. Further investigation, completed on March 19, 2016, revealed that the two block-out penetrations were not grouted and represented a previously unknown vulnerability in a credited external flood barrier.

The apparent cause of this event was less than adequate project management control for the size and scope of the External Flood Mitigation Project associated with post Fukushima Dai-ichi resolutions and requirements set forth by the NRC.

Mitigating strategies and extent of condition reviews have been implemented for the identified conditions. Permanent repair of the deficient flood barriers is complete minus cure time. Actions to correct programmatic aspects of this condition are in progress.

NRC FORM 366
(11-2015)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)(See Page 2 for required number of
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APPROVED BY OMB: NO. 3150-0104

EXPIRES: 10/31/2018

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Arkansas Nuclear One, Unit 1	05000-313	YEAR	SEQUENTIAL NUMBER	REV NO.
		2016	- 001	- 00

NARRATIVE**A. Background**

The design basis flood protection elevation for Arkansas Nuclear One, Units 1 and 2 (ANO-1 and ANO- 2) safety-related components and structures is 361 ft. Mean Sea Level (MSL). The design basis flood is a combination of the probable maximum flood (PMF) (358 ft. MSL), which is based on a 10,000 year probability, and the assumed coincident failure of the upstream Ozark Dam (+3 ft.). The ANO-1 and ANO-2 Safety Analysis Reports (SARs) state that Seismic Class/Category 1 structures are designed for the PMF of 361 ft. MSL and Seismic Class/Category 1 systems and equipment are either located on floors above 361 ft. MSL or protected by walls, waterproof doors, hatches, etc.

B. Plant Status

At the time the condition was discovered, ANO-1 and ANO-2 were operating in Mode 1 at 100% power. There were no other structures, systems, or components that were inoperable at the time that contributed to the event.

C. Event Description

ANO conducted walk downs and design verifications as follow-up activities in response to Near-Term Task Force (NTTF) Recommendation 2.3, "Flooding Walk down of the NTTF Review of Insights from the Fukushima Dai-ichi Accident." As previously reported in LER 50-313/2014-01-00 dated May 5, 2014, multiple instances of ANO-1 and ANO-2 design features that may not have provided adequate external flood protection for safety-related equipment located below the design basis flood elevation of 361 ft. MSL were documented during these walk downs. Examples of the identified deficient design features and procedures included:

- Missing or deficient internal conduit seals
- Missing or deficient seals
- Unsealed removable closure plates
- Missing gaskets
- Roof leaks
- Ground water intrusion through penetrations, building joints and conduits
- Degraded hatch gaskets
- Floor drain system cross connected between flood protected areas and non-flood areas

Due to the lack of designed isolation features on these pathways, the potential existed for flood waters to migrate into the Auxiliary Building where pumps and equipment required for safe shutdown are located.

In March 2016, as part of follow-up actions, a list of dual-function penetrations (fire and flood) was being created to determine where there was a detail difference between the Fire Penetration Log and the Flood Features database. Penetrations 00073-01-0034 and 0073-01-0063 were identified on the Fire Penetration Log as sealed with lathe and plaster; however, the Flood Features database indicated the penetrations were sealed with grout and/or cellular concrete. Lathe and plaster is sufficient for fire protection purposes, but unqualified for flood protection. This was documented in Condition Report CR-ANO-1-2016-0985 on March 17, 2016. No recent documentation could be located supporting the assertion that the penetrations were sealed with grout and/or cellular concrete. Follow-up field inspection confirmed the penetrations were sealed with lathe and plaster and the penetrations were declared non-functional for flood protection on March 19, 2016.

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NARRATIVE**D. Event Causes**

The direct cause of the event (failure to identify the lathe and plaster detail in two flood barrier block-out penetrations) is both the vendor preparer and reviewer failed to perform adequate verification of penetration details in drawings and the associated Flood Features database.

The apparent cause of this event is less than adequate project management control for the size and scope of the External Flood Mitigation Project.

The following contributing causes were also identified:

- Oversight personnel did not recognize and correct inadequate monitoring and management of the project as the scope and complexity increased.
- Flood design documents did not distinguish between lathe and plaster from grout, other than in the Fire Penetration Log, which was not accessible in the field.
- The preparer and reviewer did not follow design verification requirements. Penetration photographs were accepted as sufficient information for assigning incorrect details on architectural drawings and in the Flood Features database for the two block-out penetrations.

E. Corrective Actions

The following corrective actions have been completed to address this condition:

- Carbon steel forms were anchored to the floor around the subject block-out penetrations and sealing materials staged as a contingency until permanent repairs can be completed.
- A comprehensive review of the Flood Features database, Fire Protection Penetration Log, and architectural drawings has been performed. No further external flooding vulnerabilities were identified during this review.
- A human performance error review has been completed to document inappropriate action analysis.

The following corrective actions are being taken to further address this condition (list is not all inclusive):

- Entergy personnel and contractors responsible for gaps in oversight and accountability related to the external flooding project will be briefed on the importance of recognition and mitigation of the impacts of schedule pressures and changes in personnel assigned to the project.
- A detailed review of the vendor's root cause evaluation being developed will be performed and important results and actions from the review will be documented in the ANO corrective action plan.
- A review of completed external flood barrier walk-down packages is planned to determine if post verification entries in the walk-down package have been made without verification and to document the adequacy of all external flood boundary features (including vendor test data, qualification reports and other supporting documentation).
- Permanent repair of the defective block-out penetrations.

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NARRATIVE**F. Safety Significance Evaluation**

Arkansas Nuclear One is required to be protected from flooding within the station's design and licensing basis. The safety-related equipment required to mitigate the consequences of an accident were potentially affected by this condition. There are several factors which could mitigate the impact of these deficiencies depending on the specific conditions encountered during an actual event including the actual flood height, the capability for the subject block-out penetrations to resist water ingress, the sealing of pathways, and water removal actions. Should mitigating strategies fail, the unanalyzed pathways could permit an indeterminate amount of leakage into the Auxiliary building, potentially challenging the ability of safety-related equipment to perform the specified safety function during an accident. There were no actual consequences.

G. Basis for Reportability

This event is reported pursuant to the following criteria:

10 CFR 50.73(a)(2)(ii):

Any event of condition that resulted in

(B) The nuclear power plant being in an unanalyzed condition that significantly degraded plant safety

10 CFR 50.73(a)(2)(v)

Any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to:

(B) Remove residual heat (ANO-1 and ANO-2 Decay Heat Removal system)

H. Additional Information

10 CFR 50.73(b)(5) states that this report shall contain reference to "any previous similar events at the same plant that are known to the licensee." NUREG-1022 reporting guidance states that term "previous occurrences" should include previous events or conditions that involved the same underlying concern or reason as this event, such as the same root cause, failure, or sequence of events.

A review of the ANO corrective action program and Licensee Event Reports for the previous three years was performed. This review identified conditions that were previously identified deficiencies in the flood barrier program. Two relevant similar events were identified. These events are discussed below.

On April 7, 2015, during preparation of walk down packages for flood barrier inspections, two credible flood paths were identified between an unscheduled junction box located in the ANO-2 Turbine Building (floor elevation 329 ft., approximately 4 feet off the floor) and lighting receptacles in the Auxiliary Building elevation 317 ft. The apparent cause of this condition was the failure to recognize a drawing note which identified the junction box seal in addition to the lighting panel seals.

In addition to the above, one Licensee Event Report (50-313/2014-001-00) was submitted to the NRC (described in Section C above) on May 5, 2014 (ML14125A483).

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NARRATIVE

H. Additional Information (*continued*)

The subject condition associated with this report (failure to identify the lathe and plaster detail in two flood barrier block-out penetrations) was identified as part of the ongoing External Flood Mitigation Project extent of condition review and is not associated with corrective actions intended to prevent recurrence. Additional corrective actions are initiated when further deficiencies are identified, as noted in the partial list provided in Section E above.

Energy Industry Identification System (EIS) codes and component codes are identified in the text of this report as [XX].