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2CAN121503

10CFR 50.73

December 21, 2015

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

Subject: Licensee Event Report 50-368/2015-001-00
Purge Radiation Monitor Discovered Inoperable During Fuel Movement
Arkansas Nuclear One – Unit 2
Docket Numbers 50-368
Licensee Number NPF-6

Dear Sir or Madam:

Pursuant to the reporting requirements of 10 CFR 50.73, attached is the subject Licensee Event Report entitled, "Purge Radiation Monitor Discovered Inoperable During Fuel Movement."

There are no new commitments contained in this submittal.

Should you have any questions concerning this issue, please contact me.

Sincerely,

ORIGINAL SIGNED BY DAVID B. BICE (ACTING REGULATORY ASSURANCE MANAGER) FOR STEPHENIE L. PYLE

SLP/mkh

Attachment: Licensee Event Report 50-368/2015-001-00

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

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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 FOI, 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)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Arkansas Nuclear One, Unit 2	05000368	1 OF 5

4. TITLE

Purge Radiation Monitor Discovered Inoperable During Fuel Movement.

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
									N/A	05000
10	26	2015	2015	-- 001 --	00	12	21	2015	FACILITY NAME: N/A	DOCKET NUMBER: 05000

9. OPERATING MODE

6

10. POWER LEVEL

000

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

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ 73.77(a)(1)
- ☐ 73.77(a)(2)(i)
- ☐ 73.77(a)(2)(ii)

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Stephenie, L. Pyle, Manager, Regulatory Assurance	(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
A	IL	BLO	C518	N	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
N/A	N/A	N/A

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

On October 26, 2015, the Containment Purge and Exhaust Isolation Process Monitor was discovered to be inoperable due to not having its required sample pump in operation. The Containment Building Purge Radiation Monitor Sample Pump provides flow to the Containment Purge and Exhaust Isolation Process Monitor. Technical Specification 3.3.3.1, Table 3.3-6, requires the Containment Purge and Exhaust Isolation Process Monitor to be operable in Modes 5 and 6. For approximately 5 hours, Arkansas Nuclear One, Unit 2 was in Mode 6 with refueling operations in progress while the Containment Purge and Exhaust Isolation Process Monitor was inoperable.

The apparent cause of this event was a a human performance error associated with the failure to restart the Containment Building Purge Radiation Monitor Sample Pump following manual transfer to its alternate power supply.

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

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LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV. NO.
Arkansas Nuclear One, Unit 2	**05000368**	2015 --	001 --	00

NARRATIVE

A. Plant Status

At the time this condition was discovered, Arkansas Nuclear One, Unit 2 (ANO-2) was operating in Mode 6 during scheduled refueling outage, 2R24, with fuel handling activities in progress in the Containment Building [NH].

B. Event Description

ANO-2 Technical Specification (TS) 3.3.3.1 requires the Containment Purge and Exhaust Isolation Process Monitor to be operable in Modes 5 and 6. On October 25, 2015, ANO-2 was defueled when the power for the Containment Building Purge Radiation Monitor Sample Pump was transferred from the normal power supply to the alternate power supply during preparation for an electrical bus outage to clean and inspect the associated normal 480 VAC load center [ED]. The sample pump secured as designed during the momentary power loss while shifting power from the normal power supply to the alternate power supply, resulting in a loss of sample flow to the Containment Purge and Exhaust Isolation Process Monitor [IL].

On October 26, 2015, at 1803 CDT, ANO-2 entered Mode 6 and commenced refueling operations. On October 26, 2015, at 2300 CDT, the Containment Purge and Exhaust Isolation Process Monitor was identified as inoperable due to not having its required sample pump in operation. ANO-2 entered TS 3.3.3.1, Action B, suspended fuel movement, verified a purge was not in progress, and verified the applicable Super Particulate Iodine and Noble Gas (SPING) monitor was functional and in operation. On October 26, 2015, at 2307 CDT, the Containment Building Purge Radiation Monitor Sample Pump was restarted and at 2308 CDT, ANO-2 exited TS 3.3.3.1, Action B. For approximately 5 hours ANO-2 was in Mode 6 with refueling operations in progress while the Containment Purge and Exhaust Isolation Process Monitor was inoperable.

C. Apparent Causes

A human performance error resulted in this condition due to using the wrong sample flow indication to verify flow to the Containment Purge and Exhaust Isolation Process Monitor.

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NARRATIVE

D. Corrective Actions

Corrective actions completed:

Performed a human performance error review for this event.

Corrective actions planned include:

Revising procedure OP-2107.007, Engineered Safety Features Electrical Bus Outage, Attachment W, to add clarification of starting the Containment Building Purge Radiation Monitor Sample Pump and to clarify the location of its flow indication.

Revising procedure OP-2104.033, Containment Atmosphere Control, to add a step to verify the Containment Building Purge Radiation Monitor Sample Pump is operating when restarting the Containment Purge Exhaust Fan for continuous ventilation.

Revising checklist OPS-B36, Core Alterations Checklist, to require verification that the Containment Building Radiation Monitor Sample Pump is in operation prior to Core Alterations.

E. Safety Significance

Failure of two entire fuel assemblies is the bounding fuel handing accident for ANO-2. The offsite dose consequences from gases released during a fuel handling accident directly to the atmosphere with no filtration, assuming the reactor has been shut down for 100 hours (TS prohibits fuel handling operations prior to this time), will not exceed the acceptable limits of 10 CFR 50.67. The stated condition in this report affected the monitoring and automatic isolation of the Containment Purge exhaust pathway. The condition would not have prohibited the pathway from being manually secured from the Control Room. The SPING continued to monitor the release pathway and would have provided Control Room alarm upon high radiation signal.

Fuel handling is continuously attended and a fuel handling accident would be required to release the radiation from the fuel assembly. ANO-2 has a specific procedure for a Fuel Handling Accident which utilizes multiple diverse indications to identify fuel damage. The procedure directs that Containment Purge be secured. Based on the alternate indications available to identify a fuel handling accident, the procedural guidance to secure Containment Purge if a fuel handling accident occurs, and the bounding accident requiring two entire assemblies to be damaged and the gases exhausted through an unfiltered exhaust path, this condition had minimal safety significance.

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NARRATIVE

F. Basis For Reportability

TS 3.3.3.1 requires that the radiation monitoring instrumentation channels shown in Table 3.3-6 shall be operable with the alarm/trip setpoints within the specified limits.

Table 3.3-6 requires the Containment Purge and Exhaust Isolation Process Monitor to be operable in Modes 5 and 6 or to take action in accordance with Action 16.

Action 16 – With the number of operable channels one less than the minimum channels operable requirement, complete the following:

a. If performing core alterations or moving irradiated fuel within the reactor building, secure the containment purge system or suspend core alterations and movement of irradiated fuel within the reactor building.

b. If a containment purge is in progress, secure the containment purge system.

c. If continuously ventilating, verify the SPING monitor operable or perform the actions of the Offsite Dose Calculation Manual, Appendix 2, Table 2.2-1, or secure the containment purge system.

The operability of the radiation monitoring channel ensures that the radiation levels are continually measured in the areas served by the individual channel and the alarm or automatic action is initiated when the radiation level setpoint is exceeded.

Movement of irradiated fuel assemblies on October 26, 2015, with the Containment Purge and Exhaust Isolation Process Monitor inoperable, resulted in operation prohibited by TS. This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B).

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NARRATIVE

G. 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, Revision 3, reporting guidance states that the phrase “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. The following ANO events were related to conditions prohibited by technical specifications.

- October 24, 2014 (2CAN101402), Technical Specification 3.0.4 Violation due to a Mode Change with an Inoperable Emergency Feedwater Pump
- May 15, 2014 (2CAN051405), Operation of Switchgear Rooms’ Ventilation Prohibited by Technical Specifications
- October 21, 2013 (2CAN101303), An Inoperable Offsite Power Supply Transformer due to an Inadequate Design Configuration Results in a Condition Prohibited by Technical Specifications
- April 04, 2013 (0CAN041302), An Inoperable Emergency Control Room Chiller due to Maintenance Error Results in a Prevented Safety Function

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