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2CAN101402

October 24, 2014

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

Subject: Licensee Event Report 50-368/2014-004-01
Arkansas Nuclear One, Unit 2
Docket No. 50-368
License No. NPF-6

Reference: Licensee Event Report 50-368/2014-004-00

Dear Sir or Madam:

Pursuant to the reporting requirements of 10 CFR 50.73, attached is the revised Licensee Event Report (LER) concerning a Technical Specification 3.0.4 Violation due to a Mode Change with an Inoperable Emergency Feedwater Pump. The original LER was submitted on August 11, 2014 (ML14223A683). This revision is required due to new information being discovered after the submittal of the original LER.

There are no new commitments contained in this submittal.

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

Sincerely,

SLP/jas

Attachment: Licensee Event Report 50-368/2014-004-01

IE22
NRR

cc: Mr. Marc L. Dapas
Regional Administrator
U. S. Nuclear Regulatory Commission
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Attachment to
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Licensee Event Report 50-368/2014-004-01

NRC FORM 366 (02-2014) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 01/31/2017

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 Section (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 reverse 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 4

4. TITLE

Technical Specification 3.0.4 Violation due to a Mode Change with an Inoperable Emergency Feedwater Pump

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
06	09	2014	2014	– 004 –	01	10	23	2014	N/A	N/A
									FACILITY NAME N/A	DOCKET NUMBER N/A

9. OPERATING MODE

3

10. POWER LEVEL

000

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

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	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	N/A	N/A	N/A	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 June 12, 2014, at 1136 Central Standard time (CST), while shutdown in Mode 3, it was determined that on June 9, 2014, at 1820 CST Arkansas Nuclear One – Unit -2 (ANO-2) made a Mode Change from Mode 4 to Mode 3 with one of the two required Emergency Feedwater Pumps (EFW) inoperable due to a human performance error. The work instructions for the normal control system calibration performed in Mode 5 was not performed as written and did not require a second verification after critical adjustments were performed. This permitted an undetected mis-adjustment of the low governor frequency null voltage to exist within the governor control circuit resulting in EFW pump 2P-7A being inoperable. The 2P-7A inoperability resulted in a violation of Technical Specification (TS) 3.0.4 which precludes entry in a mode or other specified condition in the Applicability statement when a Limiting Condition of Operation (LCO) is not met and the Action requires a plant shutdown if the LCO is not met within a specified interval. LCO 3.7.1.2 requires two EFW pumps to be OPERABLE in Modes 1, 2, and 3. EFW pump 2P-7A has a 72-hour Allowable Outage Time with a required plant shutdown per TS 3.7.1.2 Action statement. The condition was corrected and a surveillance test assuring Operability was completed on June 11, 2014, at 0420 CST. 2P-7A EFW pump was declared Operable on June 11, 2014, at 0523 CST. This issue resulted in minimal safety significance.

NARRATIVE

A. Plant Status

At the time of the subject event, Arkansas Nuclear One, Unit 2 (ANO-2) was in the process of heating up after a refueling outage and was in Mode 3. There were no other structures, systems, and components inoperable at the time of the issue that contributed to the event.

B. Event Description

On June 9, 2014, at 1820 Central Standard Time (CST) ANO-2 made a Mode Change from Mode 4 to Mode 3 with steam-driven EFW pump (2P-7A), one of the two required Emergency Feedwater Pumps (EFW) [BA], inoperable due to an inadequate work instruction.

The ANO-2 EFW System (EFWS) [BA] employs two safety related pumps (turbine driven and motor driven) with two independent feedwater trains, each capable of supplying either of the two steam generators, and a non-safety related pump with interconnections with each of the safety-related EFW pump's discharge line, and to the main feedwater discharge line. During an emergency condition, the safety-related EFW pumps (2P-7A and 2P-7B) are designed to automatically supply water to the steam generators upon the actuation of an Emergency Feedwater Actuation System (EFAS) [JE] signal or a Diverse Emergency Feedwater Actuation System (DEFAS) [JE] signal. In the unlikely failure of both safety related EFW pumps, the non-safety related auxiliary feedwater pump [SJ] can be manually actuated to supply water to the steam generators.

The issue was discovered during the investigation following EFW pump 2P-7A tripping on overspeed during the performance of surveillance test 2106.006 Supplement 4, *EFW Green Train Flow Path Verification From Q-CST (T-41B).*

C. Event Cause

An apparent cause evaluation determined that the apparent cause was a human performance error due to a failure to perform the work instructions as written for the normal control system calibration performed in Mode 5. The work instruction required the test leads to be left attached for the duration of the testing. Contrary to the instructions, the test leads did not remain in place due to connector issues and were reconnected during the testing. When the leads were reattached, the reinstallation of the leads were performed as a "skill-of-the craft" evolution and the instructions for initially installing the test leads was not utilized. This resulted in the polarity of the leads being incorrect and the incorrect null voltage to be applied to the control circuit. Contributing to this event was the work instructions did not require a second verification after critical adjustments were performed. This permitted an undetected mis-adjustment of the low governor frequency null voltage to exist within the governor control circuit resulting in EFW pump 2P-7A being inoperable.

C. Event Cause (continued)

The 2P-7A inoperability resulted in a violation of Technical Specification (TS) 3.0.4 which precludes entry in a mode or other specified condition in the Applicability statement when a Limiting Condition of Operation (LCO) is not met, and the Action requires a plant shutdown if the LCO is not met within a specified interval. LCO 3.7.1.2 requires two EFW pumps to be OPERABLE in Modes 1, 2, and 3. EFW pump 2P-7A has a 72-hour Allowable Outage Time with a required plant shutdown per the Action in TS 3.7.1.2.

D. Corrective Actions

A recalibration of the governor control system was performed which identified and corrected the mis-adjusted low governor frequency null voltage and returned the signal to within the acceptable range. A manual start of 2P-7A per step10 of procedure 2106.006, *Emergency Feedwater System Operations*, was performed to ensure the turbine was being controlled properly before returning control to the control station. The model work order for Unit 2 and the procedure for Unit 1 is expected to be revised to ensure critical steps are identified and verifications to be required for any calibration adjustment to be completed. The Entergy performance management process was entered for the individuals involved in the error.

E. Safety Significance Evaluation

The safety significance for this condition was minimal. ANO-2 TS 4.7.1.2.1.b allows 24 hours after exceeding 700 pounds per square inch absolute (psia) in the steam generators to perform Inservice Testing (IST). The scope of the 2P-7A work performed during the refueling outage was such that the IST program did not require surveillance 2106.006 Supplement 1, *2P-7A Quarterly Surveillance,* to be conducted within 24 hours of reaching 700 psia. Surveillance 2106.006 Supplement 10, *2P-7A Start Test,* was successfully performed as post maintenance testing for the governor which resulted in 2P-7A being operable within 24 hours of both steam generator's pressure reaching 700 psia.

Additional justification for the minimal safety significance is contained in the Nuclear Regulatory Commission's Safety Evaluation Report for ANO-2 TS Amendment 188 (March 12, 1998) (ML021560525):

> "The proposed TS 4.7.1.2.b.1 also eliminates the need for an exception from TS 4.0.4 (currently in TS 4.7.1.2.a.1) pertaining to performing surveillances prior to entering an operating mode in which the subject system is required to be operable. The exception to TS 4.0.4 was previously required to allow the surveillance of the turbine-driven EFW pump to be deferred until steam generator pressure was above the test pressure. The proposed revision to TS 4.7.1.2.b.1 defines a maximum period of 24 hours within which the surveillance of the turbine-driven EFW pump is required to be performed once the defined test conditions are reached. Based on the expected heat removal requirements present during the 24-hour period in which the testing of the turbine-driven EFW pump can be deferred, the availability of alternate heat removal systems (including the motor-driven EFW pump) during this period, and engineering judgment, the staff finds it acceptable to perform the surveillance of the turbine-driven EFW pump within 24 hours of establishing plant conditions that can support the test.

E. Safety Significance Evaluation (continued)

Therefore, the staff agrees that the exception from TS 4.0.4 contained in TS 4.7.1.2.a.1 can be deleted.

In proposed TS 4.7.1.2.d, the licensee has revised the current 18 month surveillance requirement for verifying the turbine-driven EFW train flow path (currently TS 4.7.1.2.b.4) to include verification of the electric-driven EFW train flow path."

This change corrects a deficiency in the current TS in that the routine verification of the electric-driven EFW train flow is not included in the current TS 4.7.1.2 as a required surveillance activity. The proposed surveillance requirements would also revise the frequency of flow path verification from at least once per 18 months (during shutdown) to whenever the plant has been below Mode 3 for greater than 30 days and prior to entering Mode 2.

This change would continue to require the verification of the EFW flow paths (now for both EFW trains) following refueling outages and would add the requirement to verify the EFW flow paths following any outage that involves extended operation in those modes most likely to affect the EFW flow path configuration. The proposed flow path verifications further ensure that the EFW system is properly aligned following extended outages. The staff finds the proposed changes to be acceptable."

F. Basis For Reportability

This LER is being submitted pursuant to Title 10 Code of Federal Regulations 50.73(a)(2)(i)(B) "Any operation or condition which was prohibited by the plant's Technical Specifications".

G. Previous Occurrences

A search of the corrective action program revealed there have been no occurrences of making a Mode change not allowed by TS 3.0.4 at Arkansas Nuclear One in the past three years.

Additional Information

Energy industry identification system (EIIS) codes are identified in the text within brackets [ ]