



Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72802
Tel 479-858-3110

Stephenie L. Pyle
Manager – Regulatory Assurance
Arkansas Nuclear One

10 CFR 50.73

1CAN111702

November 13, 2017

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

Subject: Licensee Event Report 50-313/2017-002-01
Operation or Condition Prohibited by Technical Specifications
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 concerning loss of High Pressure Injection Pump at Arkansas Nuclear One, Unit 1, which resulted in the plant being in an Operation or Condition Prohibited by Technical Specifications. Additional reporting requirements related to Technical Specification 3.0.4 were discovered during NRC review and added to this LER revision.

There are no new commitments contained in this submittal. Should you have any questions concerning this issue, please contact Stephenie Pyle, Manager, Regulatory Assurance, at 479-858-4704.

Sincerely,

ORIGINAL SIGNED BY DAVID BICE FOR STEPHENIE L. PYLE

SLP/ble

Attachment: Licensee Event Report 50-313/2017-002-01

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

NRC Senior Resident Inspector
Arkansas Nuclear One
P.O. Box 310
London, AR 72847

Institute of Nuclear Power Operations
700 Galleria Parkway
Atlanta, GA 30339-5957
LEREvents@inpo.org

NRC FORM 366 (04-2017)	U.S. NUCLEAR REGULATORY COMMISSION LICENSEE EVENT REPORT (LER) (See Page 2 for required number of digits/characters for each block)	APPROVED BY OMB: NO. 3150-0104 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.	EXPIRES: 03/31/2020
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1. FACILITY NAME Arkansas Nuclear One – Unit 1	2. DOCKET NUMBER 05000313	3. PAGE 1 OF 4
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4. TITLE
High Pressure Injection Pump Inoperable for Greater Than Technical Specification Completion Time

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
05	27	2017	2017	- 002	- 01	11	13	2017	N/A	05000
									FACILITY NAME	DOCKET NUMBER
									N/A	05000

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: <i>(Check all that apply)</i>			
	<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 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 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 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 <i>(Include Area Code)</i> (479) 858-4704
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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	BJ	BKR		N					

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES <i>(If yes, complete 15. EXPECTED SUBMISSION DATE)</i> <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
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ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On May 27, 2017, an attempt to start the red train High Pressure Injection (HPI) pump [BJ] in accordance with normal operating procedures was initiated. Control Room operators received an annunciator, HPI PUMP TRIP, and observed no indication of the pump starting.

During investigative walk downs with the relay department, personnel discovered the HPI breaker was not fully racked up (trip pedal still in a tripped (down) condition and roller not free to roll). Operations personnel performed manual breaker operations to rack the 4160 V breaker [EB] further in the up direction. The pump was successfully started and declared operable.

The condition was the result of an inadequate risk evaluation.

The associated Operations Directive has been revised to require Operations management approval when waiving start-checks of vital 4160 VAC components following racking up of the respective breaker. The revision is expected to ensure appropriate personnel are involved when determining the risk associated with not testing components for functionality/operability following racking up evolutions of an associated breaker.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nureqs/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.

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Arkansas Nuclear One, Unit 1	05000-313	YEAR	SEQUENTIAL NUMBER	REV NO.
		2017	- 002	- 01

NARRATIVE

A. PLANT STATUS

Arkansas Nuclear One, Unit 1 (ANO-1) was operating at 100% rated thermal power in Mode 1 when this condition was discovered. There were no other structures, systems, or components (SSCs) that were inoperable at the time that contributed in the event.

B. EVENT DESCRIPTION

On May 11, 2017, all four High Pressure Injection (HPI) pump breakers were racked up to support ANO-1 startup from a unit outage. Operations elected to not cycle each of the breakers (start each pump individually) because the realignments required are relatively complex and would introduce the potential for human error.

On May 27, 2017, Operations attempted to place the red train HPI pump in service in accordance with normal operating procedures, in order to secure the swing HPI pump for upcoming maintenance. Annunciator, HPI PUMP TRIP, was received in the Control Room and operators observed that the pump failed to start.

During investigative walk downs, the red train HPI pump breaker was observed to not be fully racked up (trip pedal still in a tripped (down) condition and roller not free to roll). Operations personnel performed manual breaker operations to rack the 4160 V breaker further in the up direction. The red train pump was successfully started and declared operable. The green train HPI loop and pump and the swing HPI pump were not impacted by this condition.

C. BACKGROUND – SYSTEM DESIGN

The HPI system is an integral part of the Makeup and Purification system which uses two of the three makeup pumps (P-36A, P-36B, P-36C) for injection of coolant from the Borated Water Storage Tank (BWST). The HPI, Low Pressure Injection [BO], and the Core Flooding systems are collectively designed as an Emergency Core Cooling System (ECCS) which, for the entire spectrum of RCS break sizes, terminates the core thermal transient, limits the amount of zirconium-water reaction, and assures that core integrity is maintained. P-36A is the dedicated red train HPI pump, P-36C the dedicated green train HPI pump, and HPI pump P-36B can be aligned to support either train. One HPI pump train is required to satisfy accident analysis assumptions.

During accident conditions, injection of borated water is initiated by a low RCS pressure or high reactor building pressure signal, which automatically starts one HPI pump in each train. Automatic actuation of the associated valves and pumps switches the system from its normal operating makeup mode to the emergency operating mode of operation, in order to deliver water from the BWST into the reactor vessel through the reactor coolant lines. HPI pumps are powered from one of two train-specific 4160 VAC vital switchgear which are backed by train specific safety-related Emergency Diesel Generators.

In light of single failure considerations, the ANO-1 Technical Specifications (TSs) require two ECCS trains to be operable in Modes 1, 2, and Mode 3 when RCS temperature is greater than 350 °F. With one HPI train inoperable, restoration is required within 72 hours or the unit must be placed in Mode 3 within the following 6 hours and RCS temperature reduced to ≤ 350 °F within 12 hours of expiration of the 72 hour restoration Completion Time.



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		2017	- 002	- 01

In addition, plant mode changes with one train of HPI inoperable may only be made following completion of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the mode in the Applicability, and the establishment of risk management actions, if appropriate, in accordance with ANO-1 TS 3.0.4.b.

D. EVENT CAUSE

The direct cause of the red train HPI pump not starting was that its 4160 V supply breaker was not fully and properly racked up. The cause of HPI train inoperability was the failure to effectively assess risk associated with the decision to waive the start-check of the HPI pump following the breaker racking evolution.

E. CORRECTIVE ACTIONS

The associated Operations Directive has been revised to require Operations management approval when waiving start-checks of vital 4160 VAC components following racking up of the respective breaker. The revision is expected to ensure appropriate personnel are involved when determining the risk associated with not testing components for functionality/operability following racking up evolutions of an associated breaker.

The red train HPI pump receives 4160 VAC power from the red train vital switchgear A-3 via a breaker manufactured by Siemens. All other A-3 Switchgear Siemens breakers were inspected (no Siemens breakers are installed on A-4 Switchgear) and no issues with the foot pedal or roller alignment were identified.

F. SAFETY SIGNIFICANT EVALUATION

The red train HPI pump was inoperable for approximately thirteen days prior to the condition being discovered and corrected. However, the pump was only required to be operable to meet TS requirements for five of the thirteen days. While this condition resulted in exceeding the associated TS 3.5.2 Completion Time and resulted in plant mode changes being made without assessing station risk in accordance with TS 3.0.4.b, the green HPI train remained operable and available during this time period. Because one train of HPI remained operable at all times, the accident mitigation function of the system remained available over the relevant time period. Therefore, this event did not create a safety significant condition at ANO-1.

G. BASIS FOR REPORTABILITY

This event is reportable pursuant to the following criteria:

10 CFR 50.73(a)(2)(i)(B) Any operation or condition which was prohibited by Technical Specifications

The guidance provided in NUREG 1022 states under 10 CFR 50.73(a)(1):

The holder of an operating license for a nuclear power plant (licensee) shall submit a Licensee Event Report (LER) for any event of the type described in this paragraph within 60 days after the discovery of the event.



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CONTINUATION SHEET**

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		2017	- 002	- 01

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 LERs for the previous three years was performed. There were no similar events identified at ANO during this time period.

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