



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION IV  
1600 EAST LAMAR BOULEVARD  
ARLINGTON, TEXAS 76011-4511

October 2, 2019

Mr. Richard L. Anderson, Site Vice President  
Arkansas Nuclear One  
Entergy Operations, Inc.  
N-TSB-58  
1448 S.R. 333  
Russellville, AR 72802-0967

SUBJECT: ARKANSAS NUCLEAR ONE, UNITS 1 AND 2 – BIENNIAL  
PROBLEM IDENTIFICATION AND RESOLUTION INSPECTION  
REPORT 05000313/2019011 AND 05000368/2019011

Dear Mr. Anderson:

On August 22, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed a biennial problem identification and resolution inspection at your Arkansas Nuclear One Units 1 and 2, and discussed the results of this inspection with Mr. Brian Patrick and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspection team reviewed the station's corrective action program and the station's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the station was complying with NRC regulations and licensee standards for corrective action programs. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

The team also evaluated the station's processes for use of industry and NRC operating experience information and the effectiveness of the station's audits and self-assessments. Based on the samples reviewed, the team determined that your staff's performance in each of these areas adequately supported nuclear safety.

Finally, the team reviewed the station's programs to establish and maintain a safety-conscious work environment and interviewed station personnel to evaluate the effectiveness of these programs. Based on the team's observations and the results of these interviews the team found no evidence of challenges to your organization's safety-conscious work environment. Your employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

The NRC inspectors did not identify any finding or violation of more than minor significance.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

***/RA/***

Geoffrey B. Miller, Deputy Director  
Division of Reactor Safety

Docket Nos. 05000313 and 05000368  
License Nos. DPR-51 and NPF-6

Enclosure:  
As stated

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ARKANSAS NUCLEAR ONE, UNITS 1 AND 2 – BIENNIAL PROBLEM IDENTIFICATION AND  
RESOLUTION INSPECTION REPORT 05000313/2019011 AND 05000368/2019011 –  
OCTOBER 2, 2019

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**U.S. NUCLEAR REGULATORY COMMISSION**  
**Inspection Report**

Docket Numbers: 05000313 and 05000368

License Numbers: DPR-51 and NPF-6

Report Numbers: 05000313/2019011 and 05000368/2019011

Enterprise Identifier: I-2019-011-0002

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Units 1 and 2

Location: Russellville, Arkansas

Inspection Dates: August 5, 2019, to August 22, 2019

Inspectors: I. Anchondo-Lopez, Reactor Inspector  
R. Azua, IPAT, Acting Team Leader  
P. Jayroe, Reactor Inspector  
T. Sullivan, Resident Inspector

Approved By: Geoffrey B. Miller  
Deputy Director  
Division of Reactor Safety

Enclosure

## **SUMMARY**

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a biennial problem identification and resolution inspection at Arkansas Nuclear One, Units 1 and 2, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

### **List of Findings and Violations**

No findings or violations of more than minor significance were identified.

### **Additional Tracking Items**

None

## INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

## OTHER ACTIVITIES – BASELINE

### 71152B - Problem Identification and Resolution

#### Biennial Team Inspection (IP Section 02.04) (1 Sample)

The inspectors performed a biennial assessment of the licensee's corrective action program, use of operating experience, self-assessments and audits, and safety-conscious work environment (SCWE).

- **Corrective Action Program Effectiveness:** The inspectors assessed the corrective action program's effectiveness in identifying, prioritizing, evaluating, and correcting problems.
- **Operating Experience, Self-Assessments and Audits:** The inspectors assessed the effectiveness of the station's processes for use of operating experience, audits and self-assessments.
- **Safety-Conscious Work Environment:** The inspectors assessed the effectiveness of the station's programs to establish and maintain a SCWE.

## INSPECTION RESULTS

Assessment	71152B
<p><u>Effectiveness of Problem Identification:</u> Based on the samples reviewed, the team determined that the licensee's performance in this area adequately supported nuclear safety. Overall, the team found that the licensee was identifying and documenting problems at an appropriately low threshold that supported nuclear safety. On average, the licensee was identifying and documenting approximately 1360 Condition Reports (CRs) per month.</p> <p><u>Effectiveness of Prioritization and Evaluation of Issues:</u> Overall, the team found that the licensee was appropriately prioritizing and evaluating issues to support nuclear safety. Of the samples reviewed, the team found that the licensee correctly characterized each condition report as to whether it represented a condition adverse to quality, and then prioritized the evaluation and corrective actions in accordance with program guidance.</p>	

Effectiveness of Corrective Actions: Overall, the team concluded that the licensee's corrective actions supported nuclear safety. Specifically, Arkansas Nuclear One, Units 1 and 2, developed effective corrective actions for the problems evaluated in the corrective action program and generally implemented these corrective actions in a timely manner commensurate with their safety significance. However, the team did identify some CRs that were difficult to follow or where it was not clear that the corrective actions were addressed. Ultimately, it was determined that the corrective actions were all completed appropriately, but that the documentation could have been better. It was noted by the team that these examples were for CRs written in 2016 and 2017. More recent CRs appeared to be better written with a clear line of sight as to how the corrective actions were addressed.

Corrective Action Program Assessment: Based on the samples reviewed, the team determined the licensee's corrective action program complied with regulatory requirements and self-imposed standards, and the licensee's implementation of the corrective action program adequately supported nuclear safety. The team found that management's oversight of the corrective action program process was effective.

Observation: Operating Experience, Self-Assessments, and Audit Assessment	71152B
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Operating Experience: The team reviewed a variety of sources of operating experience including Part 21 notifications and other vendor correspondence, NRC generic communications, and publications from various industry groups including Institute of Nuclear Power Operations (INPO) and Electric Power Research Institute (EPRI). The team determined that Arkansas Nuclear One, Units 1 and 2, is adequately screening and addressing issues identified through operational experience that apply to the station and that this information is evaluated in a timely manner once it is received.

Self-Assessments and Audit Assessment: The team reviewed a sample of the licensee's departmental self-assessments and audits to assess whether they regularly identified performance trends and effectively addressed them. The team also reviewed audit reports to assess the effectiveness of assessments in specific areas. Overall, the team concluded that the licensee had an adequate departmental self-assessment and audit process.

Observation: Safety-Conscious Work Environment Assessment (SCWE)	71152B
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Safety-Conscious Work Environment: The team interviewed approximately forty individuals in eight group interviews. The purpose of these interviews was (1) to evaluate the willingness of your staff to raise nuclear safety issues, either by initiating a CR or by another method; (2) to evaluate the perceived effectiveness of the corrective action program at resolving identified problems; and (3) to evaluate your SCWE. The focus group participants included personnel from Security, Radiation Protection, Projects, and Instrumentation and Controls. Overall, Arkansas Nuclear One, Units 1 and 2, has an adequate SCWE.

Willingness to Raise Nuclear Safety Issues: In most focus groups, the team found no evidence of challenges to the SCWE. Individuals in these groups expressed a willingness to raise nuclear safety concerns and other issues through at least one of the several means available. However, the team found some work environment challenges in the Security Department. Through interviews with the staff members, the team identified a significant decline in morale that appears to permeate throughout the Security Department work environment. This degradation in morale appears to be caused by excessive overtime. The team brought this observation to senior plant management's attention, who were aware of

many of the issues. While not currently affecting the SCWE, the team discussed with station management that continued degradation of staff morale could negatively impact staff performance. Specifically, distracted people are more likely to make mistakes.

Overall, the team concluded that all work groups at Arkansas Nuclear One, Units 1 and 2, maintained a healthy SCWE. However, morale issues in the Security Department may have a negative effect on staff performance and potentially on plant safety.

## **EXIT MEETINGS AND DEBRIEFS**

The inspectors verified no proprietary information was retained or documented in this report.

On August 22, 2019, the inspectors presented the biennial problem identification and resolution inspection results to Mr. B. Patrick and other members of the licensee staff.



## DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71152B	Corrective Action Documents	CR-ANO-X-XXXX-XXXXX	1-2015-00631, 1-2015-01110, 1-2016-00673, 1-2016-03526, 1-2016-04473, 1-2016-04833, 1-2017-02109, 1-2017-02512, 1-2017-02518, 1-2017-03143, 1-2017-03472, 1-2017-03537, 1-2017-03673, 1-2018-00052, 1-2018-00053, 1-2018-00180, 1-2018-00181, 1-2018-00182, 1-2018-00530, 1-2018-00733, 1-2018-00851, 1-2018-00977, 1-2018-00999, 1-2018-01260, 1-2018-01348, 1-2018-01351, 1-2018-01408, 1-2018-01495, 1-2018-01610, 1-2018-01792, 1-2018-01959, 1-2018-02240, 1-2018-02282, 1-2018-02561, 1-2018-02821, 1-2018-02824, 1-2018-02845, 1-2018-03238, 1-2018-03540, 1-2018-03567, 1-2018-03614, 1-2018-03632, 1-2018-03729, 1-2018-03754, 1-2018-03930, 1-2018-04294, 1-2018-04314, 1-2018-04376, 1-2018-05007, 1-2018-05186, 1-2018-05187, 1-2018-05188, 1-2018-05206, 1-2018-05206, 1-2018-05244, 1-2018-05244(1), 1-2018-05311, 1-2018-05360, 1-2019-00141, 1-2019-00219, 1-2019-00290, 1-2019-00795, 1-2019-01017, 1-2019-01073, 1-2019-01073(1), 1-2019-01222, 1-2019-01224, 2-2002-02040, 2-2006-00318, 2-2008-01439, 2-2008-01763, 2-2010-00036, 2-2010-02793, 2-2010-02863, 2-2010-02865, 2-2012-02609, 2-2014-03154, 2-2015-00793, 2-2016-00789, 2-2016-00946, 2-2016-01071, 2-2016-04263, 2-2016-04277, 2-2017-03161, 2-2017-03337, 2-2017-05291, 2-2017-05330, 2-2017-05335, 2-2017-05335(1), 2-2017-05335(2), 2-2017-05335(3), 2-2017-06020, 2-2017-06114, 2-2018-00425, 2-2018-00867, 2-2018-00868, 2-2018-01418, 2-2018-02045, 2-2018-02545, 2-2018-03171, 2-2018-03412, 2-2018-03431, 2-2018-03442, 2-2018-03454, 2-2018-03454(1), 2-2018-03601, 2-2018-03750, 2-2018-04556, 2-2019-00430, 2-2019-00432, 2-2019-00780, 2-2019-00856, 2-2019-00863, 2-2019-00935, 2-2019-00936, 2-2019-00937, 2-2019-00938, 2-2019-00948, 2-2019-00949, 2-2019-00951, 2-2019-00952, 2-2019-00953, 2-2019-00954, 2-2019-00955, 2-2019-00956, 2-2019-00957, 2-2019-00958,	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			2-2019-00959, 2-2019-01073, 2-2019-01263, C-2012-01591, C-2015-03033, C-2016-00614, C-2017-00203, C-2017-03180, C-2017-04123, C-2017-04125, C-2017-04482, C-2017-04495, C-2017-04517, C-2017-04759, C-2018-00299, C-2018-00495, C-2018-00717, C-2018-01121, C-2018-01465, C-2018-01484, C-2018-01846, C-2018-01846(1), C-2018-01928, C-2018-02045, C-2018-02053, C-2018-02902, C-2018-03034, C-2018-03052, C-2018-03070(1), C-2018-03210, C-2018-03443, C-2018-03597, C-2018-03735, C-2018-04246, C-2018-04316, C-2018-04349, C-2018-04570, C-2018-04572, C-2019-00535(1), C-2019-01406, C-2019-02144, C-2019-02193, C-2019-02894	
	Drawings	2HBC-68-1	Large Pipe Isometric Service Water Piping from Loop 1 Header to Penetration Valve 2CV-1511-1	
		2HCC-313-1	Large Pipe Isometric Service Water Piping from 2VE-IB to Service Water Header #2	
		2HCC-314-1	Large Pipe Isometric Service Water from Control Room Emergency Chiller 2VE-1B to 2K-4B Heat Exchanger	
		CBV-A%-10-0011	1" Check Valve Sch 40 Socket Weld Ends, ANSI Class 600	08
		M-2210	Piping & Instrumentation Diagram Service Water System, Unit 2	10
		M-507	Instrument Line Class Specification	10
		ULD-2-SYS-10	ANO Unit 2 Service Water System	

	Miscellaneous	6030.109	Installation of Electrical Cable & Wire	13
	Procedures	1000.006	Procedure Control	73
		1104.023	Diesel Oil Transfer Procedure	38
		1601.505	Processing of Spent Radioactive Resin	18
		1903.069	Equipment Important to Emergency Response	09
		2104.029	Service Water System Operations	115
		CEP-NDE-0965	Visual Welding Inspections ASME, ANSI B31.1	06
		CEP-WP-003	Qualification and Control of Welders	06
		CEP-WP-GWS-1	General Welding Standard ASME/ANSI	03
		COPD-024	Risk Assessment Guidelines	67
		EN-EC-100	Employee Concerns Program	10/11
		EN-FAP-LI-001	Performance Improvement Review Group (PRG) Process	13
		EN-LI-102	Corrective Action Program	36
		EN-LI-104	Self-Assessment and Benchmark Process	13/14
		EN-LI-118	Cause Evaluation Process	27/29
		EN-LI-121	Trending and Performance Review Process	23/25
		EN-OE-100	Operating Experience Program	28/32
		EN-OP-104	Operability Determination Process	16
		EN-OP-115	Conduct of Operations	25
		EN-PL-100	Nuclear Excellence Model	09
		EN-PL-187	Safety-Conscious Work Environment (SCWE) Policy	02
		EN-PL-190	Maintaining a Strong Safety Culture	04
		EN-QV-109	Audit Process	35
		EN-TQ-114	Licensed Operator Requalification Training Program	11
		EN-WM-102	Work Implementation and Closeout	10
		OP-1032.036	Service Water Piping Leak Evaluation and Monitoring	05
		OP-1102.015	Filling and Draining the Fuel Transfer Canal	44
		OP-1104.002	Makeup and Purification System Operation	89
		OP-1106.016	Condensate, Feedwater, and Steam System Operations	76
		OP-1203-025	Natural Emergencies	68
		OP-1402.240	Inspection of Watertight Hatches	01
		OP-1903.010	EAL Classification	56/57
		OP-1903.069	Equipment Important to Safety	68
		OP-2104.036	Emergency Diesel Generator Operations	98

	Self-Assessments	LO-ALO-2018-00063	Self-Assessment – Radiation Safety Hazard Assessment, Airborne Controls, and Performance Indicators	08/05/2019
		QA-10-2018-ANO-1	2018 QA Audit of Maintenance	07/13/2018
		QA-14/15-2017-ANO-01	2017 QA Audit of Combined Radiation Protection and Radwaste	11/14/2017
		QA-3-2019-ANO-1	2019 QA Audit of Corrective Action Program at Arkansas Nuclear One	06/19/2019
		QA-8-2019-ANO-1	2019 QA Audit of Engineering Programs	04/11/2019
	Work Orders	WO-XXXXXX	150817, 260381, 261219, 379285, 379287, 457963, 462301, 461547-1, 503751, 506252, 521657-01, 521759	
		WR-XXXXXX	421140, 421141	