



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

August 14, 2015

**LICENSEE:** Entergy Operations, Inc.

**FACILITY:** Arkansas Nuclear One, Unit No. 1

**SUBJECT:** SUMMARY OF ARKANSAS NUCLEAR ONE, UNIT NO. 1, APRIL 20 – 23, 2015, AUDIT ASSOCIATED WITH LICENSE AMENDMENT REQUEST TO TRANSITION TO NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 805, "PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION FOR LIGHT WATER REACTOR ELECTRIC GENERATING PLANTS," 2001 EDITION (TAC NO. MF3419)

The purpose of this summary is to document the results of an audit performed at Arkansas Nuclear One, Unit No. 1 (ANO-1) associated with a National Fire Protection Association Standard 805 (NFPA 805) license amendment request (LAR) dated January 29, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14029A438). Subsequent to the audit, the LAR was supplemented by letters dated May 19, June 16, July 21, and August 12, 2015 (ADAMS Accession Nos. ML15139A196, ML15167A503, ML15203A205, and ML15224A729, respectively).

A review team, consisting of U.S. Nuclear Regulatory Commission (NRC) staff and contractors from the Pacific Northwest National Laboratory (PNNL) and Southwest Research Institute (SwRI)/Center for Nuclear Waste Regulatory Analyses (CNWRA), conducted a regulatory audit of ANO-1, located in Russellville, Arkansas, from April 20-23, 2015. The regulatory audit supports the review of the LAR dated January 29, 2014, submitted by Entergy Operations, Inc. (Entergy, the licensee), to transition the plant's fire protection licensing basis to Title 10 of the *Code of Federal Regulations* (CFR) 50.48(c), which endorses with exceptions NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition.

The purpose of the audit was to gain an understanding of the information needed to support the NRC staff's licensing decision regarding the LAR and to develop high quality requests for additional information (RAIs), as needed. The information submitted in support of the ANO-1 LAR is under final review, and any additional information needed to support the LAR review will be formally requested by the staff in accordance with Office of Nuclear Reactor Regulation Office Instruction LIC-101, Revision 4, "License Amendment Review Procedures."

The audit team consisted of four NRC, two PNNL, and two CNWRA staff. Enclosure 1 provides the schedule of activities conducted during the audit. Enclosure 2 contains the names of titles of audit team participants from the NRC, PNNL, CNWRA, ANO-1, and its contractors who participated in the audit (including entrance and exit meetings). Enclosure 3 contains a list of documents reviewed by the team.

The audit team held an entrance meeting on Monday, April 20, 2015, with ANO-1 staff and their contractors, as well as the NRC resident inspectors. During the remainder of the audit, team members participated in technical discussions based on their technical review area, according to the audit plan dated March 19, 2015 (ADAMS Accession No. ML15071A151). Technical discussions focused on five major areas: fire protection engineering (FPE), safe shutdown/circuit analyses (SSD/CA), fire probabilistic risk assessment (PRA), fire modeling (FM), and programmatic review. The audit team participated in plant walkdowns, tours, and technical presentations focusing on these topical areas.

At the conclusion of the audit, the audit team participated in a summary exit meeting with ANO-1 staff and management on April 23, 2015. The NRC staff provided details regarding walkdowns, technical presentations, and the completion of the audit team's objectives.

Please direct any inquiries to me at 301-415-1081 or at [Andrea.George@nrc.gov](mailto:Andrea.George@nrc.gov).



Andrea E. George, Project Manager  
Plant Licensing Branch IV-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-313

Enclosures:

1. Audit Schedule
2. Audit Participants
3. Audit Documents

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## **Schedule of Activities**

### **Monday April 20, 2015**

8:00 am Audit team members met onsite at ANO-1  
8:30 am Audit team members completed security forms for the next day's walkdowns  
9:00 am Entrance meeting, including introductions and audit overview  
9:15 am Site virtual tour  
10:30 am Begin technical discussions for fire PRA, FM in support of fire PRA, and SSD/FPE  
12:30 am Technical breakout session  
1:00 pm Continue technical discussions for FM  
1:30 pm Site Vice President meeting  
3:00 pm Combined recovery actions meeting, technical discussions  
4:30 pm NRC debrief meeting  
4:45 pm ANO briefing

### **Tuesday April 21, 2015**

8:00 am Pre-tour brief  
8:15 am Plant tour  
1:00 pm Continue technical reviews for fire PRA, FM in support of fire PRA, and SSD/FPE  
3:45 pm FM breakout session  
4:45 NRC debrief meeting  
5:00 ANO briefing

### **Wednesday April 22, 2015**

8:00 am Audit team members met onsite at ANO-1  
8:15 am PRA breakout meeting  
9:00 am Modification discussion with ANO-1  
10:30 am RAI timeline meeting  
12:45 pm Simulator Tour  
1:00 am Radiation release meeting  
1:30 am Fire brigade meeting  
2:00 am Closeout meeting for FM  
2:30 pm PRA RAI discussion  
3:00 pm SSD breakout session and closeout  
4:15 pm FPE breakout session

### **Thursday April 23, 2015**

8:00 am ANO-2 Transition Discussion  
8:15 am Closeout meeting for PRA  
8:30 am Closeout meeting for FPE  
9:15 am Exit meeting

## List of Participants

### U.S. Nuclear Regulatory Commission (NRC) Team

• Leslie Fields	NRC	Audit Team Leader
• Alex Klein	NRC	Branch Chief
• Pete Lee	NRC	FPE
• Jonathan Evans	NRC	DRA/FPRA
• Harold Barrett	NRC	FPE/SSD
• Brian Metzger	NRC	FM
• Stephen Dinsmore	NRC	DRA/FPRA/QA
• Yutaka Yamada	NRC	Observer

### Pacific Northwest National Lab (PNNL) Team

• Fleur de Peralta	PNNL	FPE/SSD
• Garill Coles	PNNL	FPRA

### Center for Nuclear Waste Regulatory Analyses (CNWRA) Team

• Marc Janssen	CNWRA	FM
• Nathan Hall	CNWRA	SSD

### Arkansas Nuclear One (ANO-1) Team

• Barry Davis	ANO	Management Sponsor
• Derrick Vest	ANO	FP Supervisor
• Darol Harrison	ICE	NFPA 805 Project Manager
• Larry Young	Kaly Tech Svs	Engineering NFPA 805 Lean
• Ronnie Hendrix	Kaly Tech Svs	FP Engineering Safe Shutdown
• Chris Little	ICS	Electrical/Circuit Analysis Safe Shutdown
• Walter Hill	DP	Penetration Seals & Barriers
• Steve Capehart	Kaly Tech Svs	Electrical / Circuit Analysis Safe Shutdown
• Thomas Robinson	ICE	Classical Fire Protection
• Milton Huff	ICE	Modifications
• Vern Kinsey	ICE	Scheduling
• Sean Hunt	Jensen Hughes	Fire Modeling
• Justin Williamson	Jensen Hughes	Fire Modeling
• Richard Harris	Enercon	PRA
• Jason Hall	ANO	PRA
• Usama Farradj	ERIN	PRA
• Joe Renner	ERIN	PRA
• Kiang Zee	ERIN	PRA
• Howard Brodt	BCP	PRA
• Steve Stumbaugh	PMI	ANO-1 Ops

• John Kinney	Kaly Tech Svs	ANO-1 Ops
• Chuck Heinzen	Entergy	Fire Protection
• Carol Couser	Entergy	Fire Protection
• James Taylor	Entergy	Safe Shutdown
• Robert Chandler	Entergy	Fire Marshal
• David Bice	ANO	Licensing Lead
• Stephenie Pyle	ANO	Manger, Licensing
• Dana Millar	Kaly Tech Svs	Licensing Support

No industry observers attended this audit.

### **List of Documents Reviewed**

1. Human Reliability Analysis focused-scope peer review
2. ANO-2 NFPA 805 Safety Evaluation
3. Fire Modeling Presentation Slides
4. Revised Main Control Room (MCR) Abandonment Report
5. Design Modification Excerpts for Resolving Information Notice 92-18 damaged valves
6. ANO EAR No 94-0080, Gas filled Transformer
7. CALC-ANO1-FP-09-00011, Evaluation of Unit 1 MCR Abandonment Times
8. Jensen Hughes Report 21022.001-RP7-01, Evaluation of Control Room Abandonment Times at Arkansas Nuclear One, Unit 1
9. CALC-ANO1-FP-08-00003, Administrative and Turbine Building Separation Analysis
10. PRA-A1-05-011, Evaluation of the Development and Timing of Hot Gas Layer Conditions in Selected ANO Fire Zones
11. PRA-ES-05-007, Timing of Hot Gas Layer in Generic Compartments

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/RA/

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LPL4-1 Reading

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DFrumkin, NRR

SDinsmore, NRR

HBarrett, NRR

LFields, NRR

JRobinson, NRR

**ADAMS Accession No. ML15225A254**

\*via memo

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DATE	7/23/15	8/14/15	8/14/15

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