

December 22, 2014

MEMORANDUM TO: Eric R. Oesterle, Acting Chief  
Plant Licensing Branch IV-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

FROM: Alexander R. Klein, Chief */RA/ D Frumkin for/*  
Fire Protection Branch  
Division of Risk Assessment  
Office of Nuclear Reactor Regulation

Hossein G. Hamzehee, Chief */RA/ S Dinsmore for/*  
PRA Licensing Branch  
Division of Risk Assessment  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF SITE AUDIT TO SUPPORT THE REVIEW OF A  
LICENSE AMENDMENT REQUEST FOR ARKANSAS NUCLEAR  
ONE, UNIT 2 TO TRANSITION TO THE NATIONAL FIRE  
PROTECTION ASSOCIATION (NFPA) STANDARD 805 FIRE  
PROTECTION LICENSING BASIS (TAC NO. MF0404)

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) participated in a regulatory audit of the Arkansas Nuclear one unit 2, (ANO2) located in Russellville, AK from July 15 -18 , 2013. The regulatory audit supports the review of the license amendment request (LAR) dated December 17, 2012, filed by Entergy Operations, Inc. (Entergy) 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 the National Fire Protection Association (NFPA) Standard 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 staff's licensing decision regarding the LAR and to develop high quality requests for additional information (RAI), as needed. The information submitted in support of the ANO2 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, "License Amendment Review Procedures."

CONTACT: Leslie C. Fields, NRR/DRA  
(301) 415-1186

The audit team consisted of 11 NRC, 3 PNNL and 3 CNWRA (NRC contractors) staff. Enclosure 1 provides the schedules of activities during the audit. Enclosure 2 lists NRC staff, PNNL staff, CNWRA staff, and the licensee's staff, and contractors who participated in the audit.

The audit team held an entrance meeting on Monday, July 15, 2013, with the licensee's staff and contractors. During the remainder of the audit, team members met in smaller groups according to the audit plan (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13178A325). ANO2 staff provided plant walk-downs focusing on fire protection engineering (FPE), safe shutdown (SSD), fire probabilistic risk assessment (PRA), and fire modeling.

Technical discussions were focused on five major areas: FPE, SSD/circuit analysis (CA), fire PRA, fire modeling, and programmatic review. Enclosure 3 contains a list of documents reviewed by the team. In addition, attendance lists for entrance and exit meetings are provided in Enclosure 4 (ADAMS Accession Nos.: ML14356A180 and ML14356A185). At the conclusion of the audit, the audit team participated in a summary exit meeting with ANO2 staff and management on July 18, 2013. NRC staff expressed its appreciation to the ANO2 staff for providing informative walk-downs and presentations for the regulatory audit team.

Docket No. 50-368

Facility Operating License No.: NPF-6

Enclosures:

As stated

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DISTRIBUTION:

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RidsNrrPMANO2Resource	RidsOgcRp Resource	RidsNrrDssStsbResource
RidsAcrsAcnw_MailCTRResource	RidsNrrDorIDprResource	
RidsRgn4MailCenterResource	RidsNrrDraAplaResource	
RidsNrrDraAfpbResource		

**ADAMS Accession No.: ML14356A172    Entrance List: ML14356A180**  
**Exit List: ML14356A185                    Package No.: ML14356A196**

OFFICE	NRR/DRA/APLA	BC: NRR/DRA/AFPB	BC: NRR/DRA/APLA
NAME	LFields	AKlein	HHamzehee
DATE	12/ 22 /2014	12/ 22 /2014	12/ 22 /2014

**OFFICAL RECORD COPY**

## **Schedule of Activities**

### **Monday, July 15, 2013**

- 8:00 am** Audit team members met onsite at the ANO2 Plant established computer connections, and began document reviews
- 9:30 am** Audit entrance meeting  
Plant overview discussions (plant overview presentations were completed the previous week as teleconferenced-presentations)
- 10:00 am** Started review of fire PRA, fire modeling in support of fire PRA, NFPA 805 Chapter 3, radioactive release, recovery actions, non-power operations (NPO), safe shutdown (SSD), nuclear safety capability assessment (NSCA)
- 12:30 pm** Badging, review of several proposed walk-down areas by videos and photos to maintain ALARA criteria, continue reviews: fire modeling, radioactive release, SSD, fire PRA, control room abandonment, multiple spurious operations (MSO), recovery actions, NPO, NSCA, fire protection engineering (FPE).
- 4:30 pm** Licensee wrap up meeting
- 5:00 pm** Adjourn for the day

### **Tuesday, July 16, 2013**

- 8:00 am** Preparation for ANO2 plant walk-downs
- 9:00 am** Plant tour briefing, security briefing and badging, dosimetry issuance, pre-job brief for walk-downs
- 9:30 am** Plant walk-down tours were conducted.
- 1:30 pm** Post walk-down discussion and debrief
- 2:00 pm** MCR abandonment presentation
- 4:30 pm** Licensee wrap up meeting
- 5:00 pm** Adjourn for the day

### **Wednesday July 17, 2013**

- 8:00 am** Morning breakout sessions
- 10:00 am** Programmatic breakout
- 12:30 pm** Presentation on plant modifications  
Reviews and breakouts continued from morning sessions
- 1:00 pm** Control room ceiling modification discussion, combined fire modeling/PRA breakout
- 2:00 pm** Discussion with licensee on RAI process
- 4:30 pm** Licensee wrap up meeting
- 5:00 pm** Adjourn for the day

**Thursday, July 18, 2013**

- 8:00 am** Morning breakout sessions and interviews
- 8:30 am** Review areas: fire modeling, Appendix R evaluation, SSD, defense in depth, safety margin, breaker control, fire PRA
- 4:15 pm** Audit exit meeting
- 4:30 pm** Adjourn

## List of Participants

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

- Leslie Fields            NRC            Audit Team Leader
- Alex Klein                NRC            Branch Chief
- Hossein Hamzehee    NRC            Branch Chief
- Geoffrey Miller        NRC            Branch Chief
- Brian Metzger         NRC            Fire Modeling
- Paul Lain                NRC            QA
- Jay Robinson          NRC            RAIs
- Bernard Litkett        NRC            SSD
- Alayna Pearson        NRC            FPE
- Stephen Dinsmore    NRC            PRA/QA
- Jonathan DeJesus     NRC            PRA

### Pacific Northwest National Laboratory (PNNL) Team

- Karl Bohlander        PNNL        FPE
- Garill Coles            PNNL        FPRA
- Peter Lowry            PNNL        FPRA

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

- Marc Janssen         Fire Modeling/Lead
- Debashis Basu        Fire Modeling
- Robert Fosdick       Programmatic/Lead

### ANO2 Nuclear Plant Team

- Bill Greeson           ANO            Management Sponsor
- Bob Beaird            ANO            FP Supervisor
- Grant Ehren           ANO            NFPA 805 Project Manager
- Richard Nance        Entergy        NFPA 805 Fleet Project Director
- Larry Young           Consultants    Engineering Lead
- Ronnie Hendrix       Entergy        FP Engineer Safe Shutdown
- Chris Little           Consultants    Electrical/Circuit Analysis Safe Shutdown
- Dennis Barton        Consultants    Electrical/Circuit Analysis Safe Shutdown
- Walter Hill            Consultants    Penetration Seals and Barriers
- Hayden Collins        Consultants    Fire Protection
- Stephen Lynn          Consultants    Modifications
- David Robinson       Consultants    Modifications

• Vern Kinsey	ICE	Scheduling
• Justin Franco	Kaly Tech	Student Intern
• Matt Dossett	Entergy	Fleet FP Eng
• Sean Hunt	Hughes	Fire Modeling
• Justin Williamson	Hughes	Fire Modeling
• Richard Harris	Entergy	PRA
• Lori Potts	ICE	PRA
• Jessica Walker	Hughes	Eng Support
• Paul Amico	Hughes	PRA
• Steve Hardy	Hughes	PRA
• Robert Burrell	Entergy	PRA
• Usama Farradj	ERIN	PRA
• Joe Renner	ERIN	PRA
• Kiang Zee	ERIN	PRA
• David Brice	ANO	Licensing Lead
• Stephenie Pyle	ANO	Manager Licensing
• Dana Miller	Kaly Tech	Licensing support

### **Industry Observers**

• Dan Kearnaghan	Browns Ferry
• Todd Stafford	Browns Ferry
• Michael Lilley	Ginna

## **List of Documents Reviewed**

- ANO-C-FP-07-001, Thermal Analysis of Concrete Embedded Conduit
- ANO2-FP-09-00013, Control Room Abandonment Study
- EC494, Justification of Barrier Protection Provided for Concrete Embedded Conduit
- ER-ANO-2003-0450-000, Review of Cable Procurements to Determine Extent of Non-Thermoset Cables
- PRA-A2-05-003R0, Fire Scenario Report
- PRA-A2-05-004, PRA Summary Report
- PRA-A2-05-011, Evaluation of Development and Timings of HGL Conditions in Selected ANO2 Fire Zones
- Generic Fire Modeling Treatments Supplements used at ANO2
- Fire pre-plans, which show fire area/zone boundaries, credited fire protection systems, etc., for the fire zones that were walked down
- Drawings and photographs of sheet metal plenum space separation above the louvers and glass doors between Unit 1 and Unit 2 control rooms. These drawings and photographs were requested since it was not possible during the walk-downs to look above the false ceiling.
- Videos and photographs of fire zones 2007-LL and 2014-LL to avoid having to walk down areas in the RCA.
- FCBT-GET-PATSS, Entergy Fleet Specific Plant Access Training
- EN-DC-203, Maintenance Rule Program
- EN-DC-204, Maintenance Rule Scope and Basis
- EN-DC-205, Maintenance Rule Monitoring
- EN-DC-207, Maintenance Rule Periodic Assessment
- OP-1003-014, ANO Fire Protection Program
- EN-AD-103, Document Control and Records Management
- EN-TQ-125, Fire Brigade Training Program



- OP-1104.032, Fire Protection Systems
- EN-DC-127, Control of Hot Work and Ignition Sources
- EN-DC-143-02 , ENO Procedure, Program and Component Health Report Supplemental Guidance
- EN-LI-102, ENO Procedure, Corrective Action Process
- ENO-DC-115, ENO Procedure, Engineering Change Process
- ENO-DC-128, ENO Procedure, Fire Protection Impact Review
- HP 2.8, Response to Unusual Radiological Occurrences
- 0247-07-0005.01, ERIN Report, Fire Risk Quantification and Summary
- EN-DC-161, ENO Procedure Control of Combustibles
- SNC-1, Quality Assurance Topical Report, Version 11.0