



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

December 23, 2013

ML13357A181

EA-13-242

Jeremy Browning, Site Vice President
Arkansas Nuclear One
Entergy Operations, Inc.
1448 SR 333
Russellville, AR 72802-0967

SUBJECT: ARKANSAS NUCLEAR ONE - NRC TRIENNIAL FIRE PROTECTION
INSPECTION REPORT (05000313/2013009 AND 05000368/2013009) AND
NOTICE OF ENFORCEMENT DISCRETION

Dear Mr. Browning:

On November 19, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Arkansas Nuclear One, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed in a debrief meeting on June 28, 2013, with Mr. M. Chisum, General Manager, and other members of your staff. Following additional in-office review and determination of the safety significance of the findings, an exit meeting was conducted on November 19, 2013, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

The NRC identified two findings of very low safety significance (Green). One finding involved a violation of NRC requirements and is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy.

Additionally, one finding involving NRC requirement 10 CFR 50.48(b) was identified and treated as a violation (EA-13-242). The team screened the violation and determined that it warranted enforcement discretion per NRC Enforcement Policy, Section 9.1, "Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)," and Section 11.05.b. of Inspection Manual Chapter 0305 (EA-13-242).

If you contest the non-cited violation in this report, you should provide a written response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001; with

copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Senior Resident Inspector at the Arkansas Nuclear One.

If you disagree with a cross-cutting aspect assignment in this report or a finding not associated with a regulatory requirement, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Senior Resident Inspector at Arkansas Nuclear One. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Geoffrey B. Miller, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 50-313; 50-368
License No. DPR-51; NPF-6

Enclosure: Inspection Report No. 05000313/2013009; 05000368/2013009
w/Attachment:
1 - Supplemental Information

Electronic Distribution to Arkansas Nuclear One

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 50-313; 50-368

License: DPR-51; NPF-6

Report Nos.: 05000313/2013009 and 05000368/2013009

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Units 1 and 2

Location: 1 Nuclear Plant Road
Russellville, AR 72801

Dates: June 10, 2013 through November 19, 2013

Team Leader: J. Mateychick, Senior Reactor Inspector, Engineering Branch 2

Inspectors: S. Alferink, Reactor Inspector, Engineering Branch 2
N. Okonkwo, Reactor Inspector, Engineering Branch 2
L. Willoughby, Senior Reactor Inspector, Technical Support Branch

Accompanying Personnel: None

Others: None

Approved By: Geoffrey B. Miller, Branch Chief
Engineering Branch 2
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000313/2013009; 05000368/2013009; 06/10/2013 – 11/19/2013; Arkansas Nuclear One; Triennial Fire Protection Team Inspection.

The report covered a two-week triennial fire protection team inspection by specialist inspectors from Region IV. Two Green findings, one of which was a non-cited violation (NCV), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process (SDP) does not apply may be Green or be assigned a severity level after the NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green The team identified a non-cited violation of Unit 1 License Conditions 2.C.(8), "Fire Protection," for the failure to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the team identified that the licensee failed to implement timely corrective actions for a condition adverse to fire protection related to a condition that could disable the automatic starting of both fire pumps as a result of fire damage. The licensee confirmed that the diesel fire pump could be started locally at its control panel in the Unit 1 Intake Structure as a compensatory measure and entered the issue into the corrective action program.

The failure to take timely corrective action for a condition adverse to fire protection was a performance deficiency. This finding is more than minor because it is associated with the Mitigating Systems cornerstone attribute of Protection Against External Events (fire) and affected the associated cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspector performed walkdowns of the fire zones of concern. Using NRC Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," the finding was assigned a low degradation rating and screened to Green in Attachment 1, Task 1.3.1, "Qualitative Screening for All Finding Categories." This finding had a cross-cutting aspect in the area of human performance associated with resources because the licensee failed to maintain long-term plant safety by minimizing long-standing equipment issues. Specifically, the licensee did not implement a modification to correct a condition adverse to fire protection in a timely manner [H.2(a)]. (Section 1R05.03.b)

- Green The team identified a finding for the failure to provide an adequate testing scheme to demonstrate that the Appendix R emergency lights satisfied their maintenance rule performance criteria. The team determined that operators were provided flashlights when they obtained the equipment bags required to perform an alternative shutdown. The licensee entered the issue into the corrective action program.

The failure to provide an adequate testing scheme to demonstrate that the Appendix R emergency lights satisfied their maintenance rule performance criteria was a performance deficiency. The performance deficiency was more than minor because if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. The team assigned the finding a low degradation rating since the ability to reach and maintain safe shutdown conditions in the event of a control room fire would be minimally impacted by the potential failure of the emergency lights to function for 8-hours. Specifically, the team determined that the results of the previous annual 8-hour discharge tests provided reasonable assurance that the lights would function for 8 hours since the licensee had maintained the same battery replacement frequency. Because this finding had a low degradation rating, it screened as having very low safety significance. This finding had a cross-cutting aspect in the decision making component of the human performance area because the licensee's decisions failed to demonstrate that nuclear safety is an overriding priority. Specifically, the licensee failed to use conservative assumptions in decision making when changing the testing scheme for the Appendix R emergency lights. The team determined that the licensee failed to use conservative assumptions in decision making because the licensee failed to consider how the revised testing scheme would impact the maintenance rule program or demonstrate compliance with 10 CFR Part 50, Appendix R, Section III.J [H.1(b)]. (Section 1R05.08.b)

B. Licensee-Identified Violations

None

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R05 Fire Protection (71111.05T)

This report presents the results of a triennial fire protection inspection conducted in accordance with NRC Inspection Procedure 71111.05T, "Fire Protection (Triennial)," at the Arkansas Nuclear One, Units 1 and 2. The licensee committed to adopt a risk informed fire protection program in accordance with National Fire Protection Association 805 (NFPA 805), but have not yet completed the program transition. The inspection team evaluated the implementation of the approved fire protection program in selected risk-significant areas with an emphasis on the procedures, equipment, fire barriers, and systems that ensure the post-fire capability to safely shutdown the plant.

Inspection Procedure 71111.05T requires the selection of three to five fire areas for review. The inspection team used the fire hazards analysis section of the Arkansas Nuclear One Individual Plant Examination of External Events to select the following four risk-significant fire areas (inspection samples) using a sample of six fire zones for review:

Fire Area	Fire Zone	Description
AA	2007-LL	"B" HPSI, LPSI, & Containment Spray Pump Room & Gallery
G	2098-L	Cable Spreading Room
G	2136-I	Health Physics Room
G	2137-I	Upper South Electrical Penetration Room
HH	2073-DD	Access Room, Pump Room, Tank Room (2B62 & Resin Addition Room)
TT	2108-S	Electrical Equipment (2B9/2B10) Room

The inspection team evaluated the licensee's fire protection program using the applicable requirements, which included plant Technical Specifications; Operating License Conditions 2.C.(8) for Unit 1 and 2.C.(3)(b) for Unit 2, "Fire Protection;" NRC safety evaluations; 10 CFR 50.48; and Branch Technical Position 9.5-1. The team also reviewed related documents that included the Unit 2 Final Safety Analysis Report (FSAR), Section 9.5; the fire hazards analysis; and the post-fire safe shutdown analysis.

Specific documents reviewed by the team are listed in the attachment. Four inspection samples were completed.

.01 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team reviewed the piping and instrumentation diagrams, safe shutdown equipment listings, safe shutdown design basis documents, and the post-fire safe shutdown analysis to verify that the safe shutdown methodology had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for equipment in the selected fire areas. The team also reviewed and observed walkdowns of the procedures for achieving and maintaining safe shutdown in the event of a fire to verify that the licensee properly implemented the safe shutdown analysis provisions.

For each of the selected fire areas, the team reviewed the separation of redundant safe shutdown cables, equipment, and components located within the same fire area. The team also reviewed the licensee's method for meeting the requirements of 10 CFR 50.48; Branch Technical Position 9.5-1, Appendix A; and 10 CFR Part 50, Appendix R, Section III.G. Specifically, the team evaluated whether at least one post-fire safe shutdown success path remained free of fire damage in the event of a fire. In addition, the team verified that the licensee met applicable license commitments.

b. Findings

No findings were identified.

.02 Passive Fire Protection

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe the material condition and configuration of the installed fire area boundaries (including walls, fire doors, and fire dampers). The team compared the installed configurations to the approved construction details, supporting fire tests, and applicable license commitments.

The team reviewed installation, repair, and qualification records for a sample of penetration seals to ensure the fill material possessed an appropriate fire rating and that the installation met the engineering design.

b. Findings

No findings were identified.

.03 Active Fire Protection

a. Inspection Scope

The team reviewed the design, maintenance, testing, and operation of the fire detection and suppression systems in the selected fire areas. The team verified the automatic detection systems and the manual and automatic suppression systems were installed,

tested, and maintained in accordance with the National Fire Protection Association code of record or approved deviations, and that each suppression system was appropriate for the hazards in the selected fire areas.

The team performed a walkdown of accessible portions of the detection and suppression systems in the selected fire areas. The team also performed a walkdown of major system support equipment in other areas (e.g., fire pumps) to assess the material condition of these systems and components.

The team reviewed the electric and diesel fire pump flow and pressure tests to verify that the pumps met their design requirements. The team also reviewed the fire water yard loop flow and pressure tests to verify that the system capability met the design requirements.

The team assessed the fire brigade capabilities by reviewing training, qualification, and drill critique records. The team also reviewed pre-fire plans and smoke removal plans for the selected fire areas to determine if appropriate information was provided to fire brigade members and plant operators to identify safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire safe shutdown capability. In addition, the team inspected fire brigade equipment to determine operational readiness for fire fighting.

The team observed an unannounced fire drill simulating a fire in the Unit 2 Intake Structure and subsequent drill critique on June 27, 2013, using the guidance contained in Inspection Procedure 71111.05AQ, "Fire Protection Annual/Quarterly." The team observed fire brigade members fight a simulated fire. The team verified that the licensee identified problems, openly discussed them in a self-critical manner at the drill debrief, and identified appropriate corrective actions. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment was brought to the scene; (5) effectiveness of fire brigade leader communications, command, and control; (6) search for victims and propagation of the fire into other areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

b. Findings

Introduction. The team identified a Green non-cited violation of License Conditions 2.C.(8) for Unit 1, "Fire Protection," for the failure to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the team identified that the licensee failed to implement timely corrective actions for a condition adverse to fire protection related to a condition that could disable the automatic starting of both fire pumps as a result of fire damage.

Description. The fire suppression water supply system has a diesel engine driven fire pump (P-6A) and an electric motor driven fire pump (P-6B) located in the Unit 1 intake structure. Only one pump is required to supply water for fixed water suppression systems and fire hoses. Both fire water pumps discharge into a common discharge

header that supplies water to an underground fire main loop. The fire water pumps are normally started automatically due to low system pressure detected by pressure switches in pump discharge header. Both fire water pumps can also be remotely started using control switches in the Unit 1 control room.

NRC Information Notice 2009-29, "Potential Failure of Fire Water Supply Pumps to Automatic Start Due to a Fire," dated November 24, 2009, communicated that NRC inspections had identified installations where fire damage to fire pump control circuits routed to the control room could prevent the automatic fire pump start.

In 2010, the licensee determined that the ANO fire water pumps were susceptible to this problem for fires in 3 fire zones (Unit 1 Control Room, Fire Zone 129-F; Unit 1 Cable Spreading Room, Fire Zone 97-R; and the Unit 1 turbine building machine shop area, Fire Zone 197-X). The evaluation confirmed that the diesel fire pump could be started locally at its control panel in the Unit 1 intake structure as a compensatory measure. The evaluation proposed a corrective action to modify the control circuits of the diesel fire pump to prevent fire damage to the circuits to the Unit 1 control room from disabling the automatic starting of the pump. The results of the licensee's evaluation and proposed corrective action were entered into the licensee's corrective action program as Condition Report CR-ANO-1-2010-00404.

During this inspection, the team determined that the licensee had not corrected the performance deficiency and that the licensee continued to rely on a manual operator compensatory action. The proposed modification had not received the funding approval necessary to allow the completion of the design and implementation. The licensee entered this issue into their corrective action program as Condition Report CR-ANO-C-2013-01520.

Analysis. The failure to take timely corrective action for a condition adverse to fire protection was a performance deficiency. This finding is more than minor because it is associated with the Mitigating Systems cornerstone attribute of Protection Against External Events (fire) and affected the associated cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspector performed walkdowns of the fire zones of concern. The fire water pump start switches are located in panel C-19 in the Unit 1 control room. The Unit 1 control room has an automatic Halon suppression system protecting cables in the subfloor. The control room is continuously manned and fire extinguishers are available for manual fire suppression of fires originating within control panels. The fire water pump circuits in the Unit 1 cable spreading room are routed in separate cable trays and converge under control room panel C-19. There are no fixed ignition sources in the cable spreading room and transient combustibles are limited. Each cable tray contains a heat sensitive wire to detect fires within or threatening the cable tray. The cable spreading room also has smoke detectors. One alarm from both types of detectors activates a deluge system protecting the cable trays. The routing of the fire water pump circuits provides reasonable assurance that the deluge system would be initiated prior to a fire progressing sufficiently to damage circuits for both pumps. The deluge system initiation would result in a fire water pump starting automatically due to low fire water system

pressure. Once started, a fire water pump will continue to run until it is shutdown at the local control panel in the Unit 1 intake structure. The fire water pump circuits of concern in the turbine building are routed in the overhead of the machine shop area and hallway. The circuits are not located near any fixed ignition sources which could impact them and are located at an elevation not subject to damage by transient combustibles. Using NRC IMC 0609, Appendix F, "Fire Protection Significance Determination Process," the finding was assigned a low degradation rating and screened to Green in Attachment 1, Task 1.3.1, "Qualitative Screening for All Finding Categories."

This finding had a cross-cutting aspect in the area of human performance associated with resources because the licensee failed to maintain long-term plant safety by minimizing long-standing equipment issues. Specifically, the licensee did not implement a modification to correct a condition adverse to fire protection in a timely manner [H.2(a)].

Enforcement. Unit 1 License Conditions 2.C.(8), "Fire Protection," requires the licensee to implement and maintain in effect all provisions of the approved fire protection program as defined in Appendix 9A of the Safety Analysis Report and as approved in the Safety Evaluation dated March 31, 1992.

The Unit 1 Safety Analysis Report, Appendix 9A, "Fire Protection Program," Section 9A, states, in part, that appropriate quality assurance program controls insure that the Fire Protection Program is maintained.

The Unit 1 Safety Analysis Report, Section 9.8.3, "Fire Protection Program," provides further clarification of the fire protection program quality assurance requirements. Sub-section 9.8.3.1.14, "Corrective Actions," states:

A corrective action system is established to ensure that conditions adverse to fire protection, such as failures, malfunctions, deficiencies, deviations, defective components, uncontrolled combustible materials, and non-conformances, are promptly identified, reported, and corrected.

Corrective action activities are controlled as described in Sections A.6 and B.13 of the Quality Assurance Program Manual with the exception that vendors furnishing fire protection items not associated with the Q-list are not required to be listed on the QSL.

The Entergy Quality Assurance Program Manual Section A.6, "Corrective Action," states, in part, "A corrective action program is established and implemented that includes prompt identification, documentation, and correction of conditions adverse to quality."

Contrary to the above, from March 2010 to June 28, 2013, the licensee failed to take timely corrective actions to address a condition adverse to fire protection. Specifically, the licensee failed to implement a modification required to prevent fire damage to circuits between the Unit 1 intake structure and the Unit 1 control room from preventing the automatic starting of the diesel fire pump.

Because this finding is of very low safety significance, a compensatory measure is being

maintained and the finding has been entered into the corrective action program, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000313/2013009-001, Untimely Corrective Action For a Condition Adverse to Fire Protection.

.04 Protection From Damage From Fire Suppression Activities

a. Inspection Scope

The team performed plant walkdowns and document reviews to verify that redundant trains of systems required for hot shutdown, which are located in the same fire area, would not be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. Specifically, the team verified that:

- A fire in one of the selected fire areas would not directly, through production of smoke, heat, or hot gases, cause activation of suppression systems that could potentially damage all redundant safe shutdown trains.
- A fire in one of the selected fire areas or the inadvertent actuation or rupture of a fire suppression system would not directly cause damage to all redundant trains (e.g., sprinkler-caused flooding of other than the locally affected train).
- Adequate drainage is provided in areas protected by water suppression systems.

b. Findings

No findings were identified.

.05 Alternative Shutdown Capability

a. Inspection Scope

Review of Methodology

The team reviewed the safe shutdown analysis, operating procedures, piping and instrumentation drawings, electrical drawings, the Final Safety Analysis Report, and other supporting documents to verify that hot and cold shutdown could be achieved and maintained from outside the control room for fires that require evacuation of the control room, with or without offsite power available.

Plant walkdowns were conducted to verify that the plant configuration was consistent with the description contained in the safe shutdown and fire hazards analyses. The team focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor decay heat removal, process monitoring instrumentation, and support systems functions.

The team also verified that the systems and components credited for shutdown would remain free from fire damage. Finally, the team verified that the transfer of control from the control room to the alternative shutdown location would not be affected by

fire-induced circuit faults (e.g., by the provision of separate fuses and power supplies for alternative shutdown control circuits).

Review of Operational Implementation

The team verified that licensed and non-licensed operators received training on alternative shutdown procedures. The team also verified that sufficient personnel to perform a safe shutdown were trained and available onsite at all times, exclusive of those assigned as fire brigade members.

The team performed a walkdown of the post-fire safe shutdown procedure with licensed and non-licensed operators to determine the adequacy of the procedure. The team verified that the operators could be reasonably expected to perform specific actions within the time required to maintain plant parameters within specified limits. Time critical actions that were verified included restoring electrical power, establishing control at the remote shutdown and local shutdown panels, establishing reactor coolant makeup, and establishing decay heat removal.

b. Findings

- .1 Introduction. The team identified an Unresolved Item (URI) concerning the failure to implement and maintain in effect all provisions of the approved fire protection program as defined by License Conditions 2.C.(8) for Unit 1 and 2.C.(3)(b) for Unit 2. Specifically, the licensee failed to maintain adequate staffing for operators to perform a simultaneous alternative shutdown of both units and staff the fire brigade. Further NRC staff evaluations will be required to determine if this issue is more than minor.

Description. The licensee provided the minimum operations shift staffing requirements in Procedure EN-OP-115, "Conduct of Operations," Revision 14. This procedure required that the Unit 1 shift be comprised of a shift manager, control room supervisor, shift technical advisor, two licensed control board operators, two non-licensed auxiliary operators, a waste control operator, and a communicator. This procedure required the same staffing for Unit 2, but it noted that the Unit 2 communicator could serve as the alternate shutdown operator (a Unit 2 specific position).

The licensee would use Procedure 1203.002, "Alternate Shutdown," Revision 24, to perform an alternative shutdown for Unit 1 and Procedure 2203.014, "Alternate Shutdown," Revision 26, to perform an alternative shutdown for Unit 2. The alternative shutdown procedure for Unit 1 required actions from the shift manager, control room supervisor, shift technical advisor, two control board operators, and two auxiliary operators. The alternative shutdown procedure for Unit 2 required actions from the shift manager, control room supervisor, shift technical advisor, two control board operators, two auxiliary operators, and the alternate shutdown operator. The licensee only required one communicator to respond to the technical support center to make the required notifications.

The licensee would use Procedure 1203.029, "Remote Shutdown," Revision 10, to perform a remote shutdown for Unit 1. The remote shutdown procedure required actions from the shift manager, control room supervisor, and two control board operators.

Unlike the alternative shutdown procedure, it did not require actions from the two auxiliary operators.

The licensee delineated operator responsibilities for alternative and remote shutdowns for both units in Calculation CALC-85-E-0086-02, "Manual Action Feasibility and Common Results," Revision 4. The team noted that this calculation was not consistent with the current staffing. The calculation had not been updated after the 2007 addition of an auxiliary operator position or the 2012 addition of an alternate shutdown operator position for Unit 2.

The team determined through discussions with the licensee that the fire brigade was composed of four non-licensed operators and one security officer. The waste control operator from each unit was assigned to the fire brigade and designated as the potential fire brigade leader, depending on the unit affected. In the event of an alternative shutdown of Unit 2, the licensee credited the waste control operator from Unit 2 as the fire brigade leader and the waste control operator from Unit 1, two auxiliary operators from Unit 1, and the security officer as the remaining fire brigade members. The licensee discussed operator responsibilities for an alternative shutdown of Unit 2 coincident with a remote shutdown of Unit 1, but did not discuss operator responsibilities for a simultaneous alternative shutdown of both units.

The team concluded that the licensee failed to maintain adequate staffing for operators to perform a simultaneous alternative shutdown of both units and staff the fire brigade. Specifically, the licensee required actions from all operators other than the two waste control operators during a simultaneous alternative shutdown of both units. This left the two waste control operators and the security officer as the only assigned fire brigade members that could respond to a potential control room fire.

The team reviewed the fire protection licensing basis. Since the control rooms were located in the same fire area, the team concluded that the licensee must be able to perform a simultaneous alternative shutdown of both units and staff the fire brigade. The team noted that the licensee did not have an exemption from this requirement.

The licensee identified this non-compliance in 2006 and documented this issue in Condition Report CR-ANO-C-2006-00048, Corrective Action 36. In response to this concern, the licensee performed a risk evaluation but failed to initiate any corrective actions or compensatory measures. In 2007 and 2012, the licensee subsequently added the auxiliary operator and alternate shutdown operator positions, respectively, for an alternative shutdown of Unit 2. During each addition, the licensee failed to ensure the adequate staffing for operators to perform a simultaneous alternative shutdown of both units and staff the fire brigade.

The licensee determined that alternative shutdown of both units would not be required since a fire in one control room would not be capable of causing circuit damage in equipment located in the other control room. The licensee developed detailed fire models to demonstrate this position as part of the transition to NFPA-805. The licensee's License Amendment Request for Unit 2, dated March 27, 2012 (ML12087A113) has been submitted to the NRC and is under review by the NRC staff.

The result of the NRC staff review of this analysis will be required to determine if this issue is more than minor.

This issue is being treated as an unresolved item:

URI 05000313;05000368/2013009-002, "Failure to Maintain Adequate Staffing for Operators to Perform a Simultaneous Alternative Shutdown of Both Units and Staff the Fire Brigade."

- .2 Introduction. The team identified a violation of Unit 2 Technical Specification 6.4.1.c for the failure to implement and maintain adequate written procedures covering fire protection program implementation. Specifically, the licensee failed to maintain an alternative shutdown procedure that successfully mitigated the spurious opening of an atmospheric dump valve block valve. This violation has been screened using the criteria in NRC Enforcement Policy, Section 9.1, "Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)" and determined to warrant enforcement discretion.

Description. The licensee used Procedure 2203.014, "Alternate Shutdown," Revision 26, to shutdown the reactor from various control stations outside of the control room in the event a fire required evacuation of the Unit 2 control room. This alternative shutdown procedure was developed, in part, from the results of the safe shutdown analysis contained in Calculation CALC-85-E-0086-02, "Manual Action Feasibility and Common Results," Revision 4.

The manual action feasibility analysis discussed the potential for fire damage to result in a spurious atmospheric dump valve actuation. The analysis noted that the consequences of this scenario included an uncontrolled primary system cooldown. The analysis also noted that the atmospheric dump valves were fail-open valves and were kept isolated by normally closed motor-operated gate valves.

The analysis referenced the results of Calculation CALC-85-E-0072-06, "Effect of Spurious Opening of ADV on ANO-2 RCS Level and Subcooling Margin," Revision 0. This calculation determined that a spuriously opened atmospheric dump valve would result in a loss of pressurizer level indication in less than 3 minutes due to reactor coolant system shrinkage from overcooling; subcooling margin based on T_{ave} would not be lost, but local inner vessel subcooling margin could be temporarily lost before recovering; and a reactor vessel head bubble could appear in just over 5 minutes but would not grow large enough to interfere with natural circulation. The team noted that the loss of subcooling and the formation of a reactor vessel head bubble were outside the plant response allowed by the regulations.

Based on the results of this calculation, the manual action feasibility analysis stated that a high priority action must be taken to de-energize the block valve and locally verify it closed for any areas where an atmospheric dump valve block valve was susceptible to spurious opening. The team noted that the control room is a fire area where an atmospheric dump valve block valve was susceptible to spurious opening.

The team performed a timed walkdown of the alternative shutdown procedure. Based on the walkdown results, the team identified that the alternative shutdown procedure did not provide adequate steps for operators to mitigate this scenario. Specifically, the team

identified that there were no high priority actions taken to de-energize the block valve and locally verify it closed. The team noted that the procedure did provide steps to accomplish this activity. However, the steps were included in the recovery and cooldown sections of the procedure which would result in them being performed much later in the process.

Analysis. The failure to maintain adequate written procedures covering fire protection program implementation was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

A senior reactor analyst performed a hand calculation to bound the risk significance of this finding. The senior reactor analyst determined that the change in core damage frequency was less than $1E-4$, so the finding was not of high safety significance (Red). Therefore, this finding qualified for enforcement discretion using Section 9.1 of the Enforcement Policy, "Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)."

This finding did not have a cross-cutting aspect assigned because it qualified for enforcement discretion.

Enforcement. Unit 2 Technical Specification 6.4.1.c states that written procedures shall be established, implemented, and maintained covering fire protection program implementation. Contrary to this requirement, prior to June 28, 2013, the licensee failed to establish, implement, and maintain written procedures covering fire protection program implementation. Specifically, the licensee failed to maintain an alternative shutdown procedure that successfully mitigated the spurious opening of an atmospheric dump valve block valve.

Because the licensee committed to adopting National Fire Protection Association Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," and has submitted a license amendment request to the NRC to change their fire protection program license basis to comply with 10 CFR 50.48(c), this violation is eligible for enforcement discretion as described in Section 9.1 of the Enforcement Policy, "Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)." Under this interim Enforcement Policy, the NRC will normally not take enforcement action for a violation of 10 CFR 50.48(b) (or the requirements in a fire protection license condition) involving a problem in an area such as engineering, design, implementing procedures, or installation if the violation is documented in an inspection report and meets all of the following criteria:

- The licensee identified the violation as a result of a voluntary initiative to adopt the risk-informed, performance based fire protection program under 10 CFR 50.48(c), or, if the NRC identified the violation, the NRC found it likely that the licensee would have identified the violation in light of the defined scope, thoroughness, and schedule of its transition to 10 CFR 50.48(c);

- The licensee corrected the violation or will correct the violation after completing its transition to 10 CFR 50.48(c). Also, the licensee took immediate corrective action or compensatory measures or both within a reasonable time commensurate with the risk significance of the issue following identification; this action should involve expanding the initiative, as necessary, to identify other issues caused by similar root causes;
- Routine licensee efforts, such as normal surveillance or quality assurance activities, were not likely to have previously identified the violation; and
- The violation was not willful.

The violation was not associated with a finding of high safety significance. Specifically, the team determined that: (1) the licensee would have identified the violation in light of the defined scope, thoroughness, and schedule of its transition to 10 CFR 50.48(c) because the licensee was performing new analyses and developing a new alternative shutdown procedure for the transition to NFPA-805; (2) the licensee will correct the violation after completing its transition to 10 CFR 50.48(c) and took an immediate corrective action within a reasonable time commensurate with the risk significance of the issue following identification; (3) routine licensee efforts (such as normal surveillance or quality assurance activities) were not likely to have previously identified the violation; (4) the violation was not willful; and (5) the team determined that this violation was not of high safety significance (Red).

The licensee entered this issue into their corrective action program as Condition Report CR-ANO-2-2013-01329 and implemented appropriate compensatory measures. Since all the criteria for enforcement discretion were met, the NRC is exercising enforcement discretion for this issue (EA-13-242).

.06 Circuit Analysis

a. Inspection Scope

The team reviewed the post-fire safe shutdown analysis to verify that the licensee identified the circuits that may impact the ability to achieve and maintain safe shutdown. The team verified, on a sample basis, that the licensee properly identified the cables for equipment required to achieve and maintain hot shutdown conditions in the event of a fire in the selected fire areas. The team verified that these cables were either adequately protected from the potentially adverse effects of fire damage or were analyzed to show that fire induced circuit faults (e.g., hot shorts, open circuits, and shorts to ground) would not prevent safe shutdown. The team reviewed the circuits associated with the following components:

- 2CV-5084-1 Shutdown Cooling RCS Shut-Off Valve
- 2CV-5086-2 Shutdown Cooling RCS Suction Isolation Valve
- 2CV-5038-1 Shutdown Cooling RCS Shut-off Valve
- 2CV-5631-2 Refueling Water Tank Outlet Valve
- 2CV-5630-1 Refueling Water Tank Outlet Valve

- 2CV-1037-1 EFW from Pump 2P7A to SG 2E24A Isolation Valve
- 2CV-1039-1 EFW from Pump 2P7A to SG 2E24B Isolation Valve
- 2CV-1076-2 EFW from Pump 2P7A to SG 2E24B Flow Control Valve
- 2CV-1026-2 EFW from Pump 2P7A to SG 2E24A Flow Control Valve

For this sample, the team reviewed electrical elementary and block diagrams and identified power, control, and instrument cables necessary to support their operation. In addition, the team reviewed cable routing information to verify that fire protection features were in place as needed to satisfy the separation requirements specified in the fire protection license basis.

b. Findings

No findings were identified.

.07 Communications

a. Inspection Scope

The team inspected the contents of designated emergency storage lockers and reviewed the alternative shutdown procedure to verify that portable radio communications and fixed emergency communications systems were available, operable, and adequate for the performance of designated activities. The team verified the capability of the communication systems to support the operators in the conduct and coordination of their required actions. The team also verified that the design and location of communications equipment such as repeaters, transmitters, and antennas would not cause a loss of communications during a fire. The team discussed system design, testing, and maintenance with the system engineer.

b. Findings

No findings were identified.

.08 Emergency Lighting

a. Inspection Scope

The team reviewed the portion of the emergency lighting system required for alternative shutdown to verify that it was adequate to support the performance of manual actions required to achieve and maintain hot shutdown conditions and to illuminate access and egress routes to the areas where manual actions would be required. The team evaluated the locations and positioning of the emergency lights during a walkthrough of the alternative shutdown procedure.

The team verified that the licensee installed emergency lights with an 8-hour capacity, maintained the emergency light batteries in accordance with manufacturer recommendations, and tested and performed maintenance in accordance with plant procedures and industry practices.

b. Findings

Introduction. The team identified a Green finding for the failure to provide an adequate testing scheme to demonstrate that the Appendix R emergency lights satisfied their maintenance rule performance criteria.

Description. In 2010, Entergy issued Entergy Fleet Engineering Standard EN-FP-S-001-Multi, "Appendix R Emergency Lighting Units," Revision 0, to define the criteria for preventive maintenance, surveillance tests, and the maintenance rule that applied to the Appendix R emergency lights. In response to this standard, the licensee changed their method for demonstrating compliance with the lighting requirements of 10 CFR Part 50, Appendix R, Section III.J. The licensee made this change to the fire protection program in March 2012.

Prior to the change, the licensee performed an annual 8-hour discharge test of all Appendix R emergency lights installed in the plant. After the change, the licensee performed an 8-hour discharge test of a small sample (5 percent) of the batteries that were removed from service at the end of life during the annual preventive maintenance tasks. The battery replacement frequency was calculated independently for each battery based on average temperature and float voltage.

The team reviewed the maintenance rule program and noted that the licensee incorporated the 8-hour capacity of the Appendix R emergency lights into the system performance criteria program on April 4, 2011. Specifically, the licensee implemented the following performance criteria for the Appendix R emergency lights:

For a rolling 12 month cycle Condition Monitoring Performance Criteria failure rate should be no more than 10 percent of the total Appendix R Emergency Lighting Unit population.

The team determined that the annual preventive maintenance tasks for the Appendix R emergency lights were sufficient to detect gross failures of the lights (i.e., lamp failures or charging card failures), but were insufficient to detect failures of the batteries to last 8 hours. Specifically, the team concluded the testing scheme was inadequate to detect if greater than 10 percent of the total population of Appendix R emergency lights could provide initial illumination but could not provide illumination for the full 8 hours.

The testing scheme was insufficient because it only examined the population of batteries that were replaced. Since the licensee employed a graduated replacement strategy based on temperature and float voltage, the licensee only replaced a sample of the population each year. The testing deficiency was further amplified by the fact that only a small percentage of batteries were tested from the replacement battery population. The team noted that only 5 emergency lights were discharge tested out of a total population of 151 lights since the program change was made.

Analysis. The failure to provide an adequate testing scheme to demonstrate that the Appendix R emergency lights satisfied their maintenance rule performance criteria was a performance deficiency. The performance deficiency was more than minor because if

left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern.

The team evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated February 28, 2005, because it affected the ability to reach and maintain safe shutdown conditions in case of a fire. The team assigned the finding to the post-fire safe shutdown category since it impacted the remote shutdown and control room abandonment element.

The team assigned the finding a low degradation rating since the ability to reach and maintain safe shutdown conditions in the event of a control room fire would be minimally impacted by the potential failure of the emergency lights to function for 8-hours. Specifically, the team determined that the results of the previous annual 8-hour discharge tests provided reasonable assurance that the lights would function for 8 hours since the licensee maintained the same battery replacement frequency. In addition, the team determined that operators were provided flashlights when they obtained the equipment bags required to perform an alternative shutdown. Because this finding had a low degradation rating, it screened as having very low safety significance (Green).

This finding had a cross-cutting aspect in the Decision Making component of the Human Performance area because the licensee's decisions failed to demonstrate that nuclear safety is an overriding priority. Specifically, the licensee failed to use conservative assumptions in decision making when changing the testing scheme for the Appendix R emergency lights. The team determined that the licensee failed to use conservative assumptions in decision making because the licensee failed to consider how the revised testing scheme would impact the maintenance rule program or demonstrate compliance with 10 CFR Part 50, Appendix R, Section III.J [H.1(b)].

Enforcement. This finding does not involve enforcement action because no violation of a regulatory requirement was identified. The licensee entered this finding into the corrective action program as Condition Report CR-ANO-C-2013-01704. Because this finding did not involve a violation and was of very low safety significance, it is identified as FIN 05000313;05000368/2013009-003, "Failure to Demonstrate that the Appendix R Emergency Lights Satisfied their Maintenance Rule Performance Criteria."

.09 Cold Shutdown Repairs

a. Inspection Scope

The team verified that the licensee identified repairs needed to reach and maintain cold shutdown and had dedicated repair procedures, equipment, and materials to accomplish these repairs. Using these procedures, the team evaluated whether these components could be repaired in time to bring the plant to cold shutdown within the time frames specified in their design and licensing bases. The Arkansas Nuclear One Units 1 and 2 use Calculation 85-E-0086-02, "Manual Action Feasibility and Common Results," Revision 4, to identify and accomplish any necessary cold shutdown repairs.

Unit 1 had an exemption to the requirements of 10 CFR 50, Appendix R, Section III.L.1, to achieve cold shutdown within 72 hours without the use of offsite power. Unit 1 is

required to achieve cold shutdown within 140 hours, which would provide adequate time to perform cold shutdown repairs

The team verified that the repair equipment, components, tools, and materials needed for the repairs were available and accessible on site.

b. Findings

No findings were identified.

.10 Compensatory Measure

a. Inspection Scope

The team verified that compensatory measures were implemented for out-of-service, degraded, or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g., detection and suppression systems and equipment; passive fire barriers; or pumps, valves, or electrical devices providing safe shutdown functions). The team also verified that the short-term compensatory measures compensated for the degraded function or feature until appropriate corrective action could be taken and that the licensee was effective in returning the equipment to service in a reasonable period of time.

The team reviewed operator manual actions credited for achieving hot shutdown for fires that do not require an alternative shutdown. The team verified that operators could reasonably be expected to perform the actions within the applicable shutdown time requirements. The team reviewed the operator manual actions using the guidance contained in NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," dated October 2007.

b. Findings

No findings were identified.

.11 B.5.b Inspection Activities

a. Inspection Scope

The team reviewed the licensee's implementation of guidance and strategies intended to maintain or restore core, containment, and spent fuel pool cooling capabilities under the circumstances associated with the potential loss of large areas of the plant due to explosions or fire as required by Section B.5.b of the Interim Compensatory Measures Order, EA-02-026, dated February 25, 2002, and 10 CFR 50.54(hh)(2).

The team verified that the licensee maintained and implemented adequate procedures, maintained and tested equipment necessary to properly implement the strategies, and ensured station personnel were knowledgeable and capable of implementing the procedures. The team performed a visual inspection of portable equipment used to implement the strategy to ensure the availability and material readiness of the

equipment, including the adequacy of portable pump trailer hitch attachments, and verify the availability of on-site vehicles capable of towing the portable pump. The team assessed the off-site ability to obtain fuel for the portable pump and foam used for fire fighting efforts. The strategy and procedure selected for this inspection sample included:

- Alternate Feedwater Makeup Sources
- Alternate Fire Water Supply
- BWST/RWT (T-3/2T-3) Makeup

One B.5.b mitigating strategy sample was completed.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES [OA]

4OA2 Identification and Resolution of Problems

Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team selected a sample of condition reports associated with the licensee's fire protection program to verify that the licensee had an appropriate threshold for identifying deficiencies. The team reviewed the corrective actions proposed and implemented to verify that they were effective in correcting identified deficiencies. The team evaluated the quality of recent engineering evaluations through a review of condition reports, calculations, and other documents during the inspection.

b. Findings

No findings were identified.

4OA5 Other Activities

asNone

4OA6 Meetings, Including Exit

Debrief Meeting Summary

The team presented the inspection results to Mr. M. Chisum, General Manager, and other members of the licensee staff at a debrief meeting on June 28, 2013. The licensee acknowledged the findings presented.

Exit Meeting Summary

Following additional in-office review and determination of the safety significance of the

findings, an exit meeting was conducted on November 19, 2013, with Mr. J. Browning, Site Vice President, and other members of the licensee staff. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

40A7 Licensee-Identified Violations

None

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

D. Barton, Electrical Engineer
R. Beaird, Supervisor, Fire Protection
D. Bice, Senior Licensing Specialist
E. Blackard, Supervisor, Plant Programs
J. Browning, Site Vice President
G. Burghardt, Shift Manager, Unit 2 Operations
R. Chandler, Senior Instructor
M. Chisum, General Manager
C. Couser, Fire Protection Engineer
R. Eichenberger, Manager, Corrective Actions and Assessments
W. Greeson, Manager, Programs/Components
C. Heinzen, Fire Protection Engineer
R. Hendrix, Fire Protection Engineer
J. Horton, Assistant Operations Manager, Unit 2 Operations
D. James, Director, Nuclear Safety Assessment
R. Loveland, Senior Reactor Operator
J. McCoy, Director, Engineering
S. Pyle, Manager, Licensing
D. Reed, Unit 2 Non-Licensed Operator
C. Simpson, Operations Training Supervisor
K. Sinyard, Training Instructor
M. Skartved, Work control
P. Williams, Manager, Operations

NRC Personnel

B. Tindell, Senior Resident Inspector
A. Fairbanks, Resident Inspector
W. Schaup, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000313;05000368/2013009-002	URI	Failure to Maintain Adequate Staffing for Operators to Perform a Simultaneous Alternative Shutdown of Both Units and Staff the Fire Brigade (Section 1R05.05.b.1)
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Opened and Closed

05000313/2013009-001	NCV	Untimely Corrective Action For a Condition Adverse to Fire Protection (Section 1R05.03.b)
05000313;05000368/2013009-003	FIN	Failure to Demonstrate that the Appendix R Emergency Lights Satisfied their Maintenance Rule Performance Criteria (Section 1R05.08.b)

Closed

None

LIST OF DOCUMENTS REVIEWEDCABLE ROUTING DATA

<u>Component</u>	<u>Component</u>	<u>Component</u>	<u>Component</u>	<u>Component</u>
2CV-1076-2	2CV-1026-2	2CV-1037-1	2CV-1039-1	2CV-5631-2
2CV-5630-1	2CV-5038-1	2CV-5086-2	2CV-5084-1	2EHTR-A1
2EHTR-AA1	2EHTR-AA2	2HTR-BB1		

CALCULATIONS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ANO-ER-03-013	Manual Stroke Times for Various MOVs for Alternate Shutdown Means	1
ANOC-FP-08-00005	ANO Code Compliance Report for NFPA 600, Standard on Industrial Fire Brigades	1
ANOC-FP-08-00013	NFPA 13 (1994) Code Compliance Evaluation, Unit 1 Intake Structure Wet Pipe Sprinkler System (354' and 366' Elevations) & Unit 2 Intake Structure Pre-Action Sprinkler System (354' Elevation)	1
ANOC-FP-09-00005	ANO Code Compliance Report for NFPA 14, 1983 Edition, Standpipe and Hose Systems	1 & 2
CALC -ANOC-FP-09-00006	ANO Code Compliance Report for NFPA 20, 1969 Edition, Centrifugal Fire Pumps	1
ANOC-FP-09-00008	ANO Code Compliance Report for NFPA 50A, 1973 Edition, Gaseous Hydrogen Systems	1
ANO1-FP-09-00001	ANO Code Compliance Report for NFPA 72, 1996 Edition, National Fire Alarm Code	1
ANO1-FP-09-00002	ANO Code Compliance Report for NFPA 72A, 1975 Edition, Local Protective Signaling Systems	1
ANO1-FP-09-00003	ANO Code Compliance Report for NFPA 72D, 1975	1

	Edition, Proprietary Protective Signaling Systems	
ANO1-FP-09-00004	ANO Code Compliance Report for NFPA 72E, 1974 Edition, Automatic Fire Detectors	1
ANO2-FP-09-00002	ANO Code Compliance Report for NFPA 72A, 1975 Edition, Local Protective Signaling Systems	1
ANO2-FP-09-00003	ANO Code Compliance Report for NFPA 72D, 1975 Edition, Proprietary Protective Signaling Systems	1
ANO2-FP-09-00004	ANO Code Compliance Report for NFPA 72E, 1974 Edition, Automatic Fire Detectors	1
ANO2-FP-09-00006	NFPA 13 (1975) Code Compliance Evaluation, Unit 2 EDG Rooms, the Electrical Penetration Rooms and the Cable Spreading Areas in the Reactor Building	1
ANO2-FP-09-00007	NFPA 13 (1980) Code Compliance Evaluation Unit 2 CA-2 and Dress Out Areas and Fire Brigade Ready Room	1
ANO2-FP-09-00008	NFPA 13 (1983) Code Compliance Evaluation, Unit 2 General Access Area (Fire Zone 2006-LL) and Waste Gas Area (Fire Zone 2073-DD)	1
ANO2-FP-09-00014	Fire Protection Engineering Evaluation for Unit 2 Fireflex Seals	1
ANO2-FP-09-00020	ANO Unit2 Code Compliance Report for Intake Structure fire Area OO elevation 366'. NFPA 15, 1982 Edition, Water Spray Fixed Systems for Fire Protection	0
ANO2-FP-09-00022	ANO Code Compliance Report for NFPA 72E, 1974 Edition, Automatic Fire Detectors	1
ANO2-FP-09-00029	Fire Protection Engineering Evaluation for Penetration Seals in Fire Area JJ	1
ANO2-FP-09-0030	Fire Protection Engineering Evaluation for Penetration Seals in Fire Area TT	0
ANO2-FP-10-00004	Fire Protection Engineering Evaluation For Penetration Seals 2118-01-0200, 2118-01-0295 and 2118-01-0302	0
10-E-0028-01	ANO-1 & 2 Fire Protection System Hydraulic Model	0
85-E-0072-06	Effect of Spurious Opening of ADV on ANO-2 RCS Level and Subcooling Margin	0

85-E-0086-01	SSCA Safe Shutdown Capability Assessment	7
85-E-0086-02	Manual Action Feasibility and Common Results	4
85-E-0086-18	Safe Shutdown Equipment List Methodology	2
85-E-0087-01	SSCA Safe Shutdown Capability Assessment	9
85-E-0087-23	Safe Shutdown Equipment List (SSEL) Methodology	1
85-E-0087-24	Safe Shutdown Cable Analysis	1
85-E-0115-00	Report on Determination of Minimum Design Objective Received Signal Level for RADIAX Antenna System	1
85-E-0116-00	Report of Susceptibility of Selected Measurement and Control Circuit to Electromagnetic Interference Created by Radio Frequency Fields Produced by UHF Transmissions	1
85-E-0117-00	Distributive Antenna System Final Report and Performance Evaluation	1
85-E-0122-00	Evaluation of Arkansas Nuclear One Radio System for Alternate Shutdown	1
89-R-2002-02	Penetration Seal Analysis for Penetration 2098-07-0098	0
90-D-2001-02	Diesel Generator K-9 Loading Calculation	2
963559D01-01	Idea/Computer/Telephone Room Power & AC Upgrade for CSB, GSB, Admin, RERTC, and Node 2 & 3	1
95-E-0001-02	ANO U1 Millstone Study-Connected Load, MCC Circuit Voltage Drop and Load Center Accident Loading	1
010149E301-01	UHF Radio Replacement Analysis	0
PRA-A2-05-004	ANO-2 Fire Probabilistic Risk Assessment, Fire PRA Summary Report, ERIN Report 0247-06-0006.06, Revision 4	0

CONDITION REPORTS

CR-ANO-1-2010-00404	CR-ANO-1-2010-03071	CR-ANO- C-2010-02201
CR-ANO-1-2010-03020	CR-ANO-1-2010-00492	CR-ANO- C-2010-02202
CR-ANO- C-2010-02189	CR-ANO-1-2010-03116	CR-ANO-1-2013-00498
CR-ANO-C-2010-02200	CR-ANO-C-2010-01576	CR-ANO-1-2013-00951
CR-ANO-C-2013-01152	CR-ANO-C-2013-01536*	CR-ANO-2-2013-1328*

CR-ANO-C-2013-1703*	CR-ANO-C-2013-1701*	CR-ANO-C-2013-1697*
CR-ANO-C-2013-1695*	CR-ANO-2-2013-1329*	CR-ANO-2-2013-1321*
CR-ANO-2-2013-1319*	CR-ANO-2-2013-1217*	CR-ANO-c-2013-1704*
CR-ANO-C-2013-1659*	CR-ANO-C-2013-1675*	CR-ANO-2-2013-1260*
CR-ANO-C-2013-1536*	CR-ANO-C-2013-1520*	CR-ANO-C-2013-1510*
CR-ANO-2-2013-1241*	CR-ANO-2-2013-1223*	CR-ANO-1-2013-1648*
CR-ANO-C-2013-1536*	CR-ANO-C-2010-02205	CR-ANO-C02010-02295
CR-ANO-C-2010-02325	CR-ANO-C-2010-02392	CR-ANO-C-2010-02209
CR-ANO-C-2007-01564	CR-ANO-C-2011-01570	CR-ANO-C-2006-00048
CR-ANO-2-2004-01907	CR-ANO-2-2001-00396	CR-ANO-2-2013-01241*
CR-ANO-C-2010-02392	CR-ANO-C-2013-01697*	CR-ANO-C-2013-01703*
CR-ANO-C-2013-01704*	CR-ANO-C-2010-02180	CR-ANO- C-2010-01631
CR-ANO-C-2010-02182	CR-ANO-C-2011-00426	CR-ANO-C-2013-1691*
CR-ANO-C-2013-01937*		

*Issued as a result of inspection activities.

DRAWINGS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
A-2600, Sheet 2	Fire Barrier Penetration Seal Details Blockouts	5
E-4	Single Line Meter & Relay Diagram 4160 Volt System, Main Supply	26
E-21, Sheet 1	Administration Building Expansion II Electrical Riser	23
E-346	Schematic Diagram Motor Driven Fire Pump	8
E-347, Sheet 1	Schematic Diagram Diesel Driven Fire Pump	15
E-613, Sheet 1	Underground Conduit and Grounding Transformer Yard Area	14
E-651	Conduit & Tray Layout Turbine Generator Building Area 2 Elevation 335'-0" and 354'-0"	62
E-668	Conduit & Tray Layout Auxiliary Building Area 4 Elevation 354'-0"	51
E-685	Conduit & Tray Layout Cable Spreading Room	21
E-703, Sheet 1 of 17	Distributive Antenna System Radix Routing Plan Floor Plan EL. 317'-0"	N
E-703, Sheet 2 of 17	Distributive Antenna System Radix Routing Plan Floor Plan EL. 335'-0"	N
E-703, Sheet 3 of 17	Distributive Antenna System Radix Routing Plan Floor	N

	Plan EL. 354'-0"	
E-703, Sheet 4 of 17	Distributive Antenna System Radix Routing Plan Floor Plan EL. 368'-0"	N
E-703, Sheet 5 of 17	Distributive Antenna System Radix Routing Plan Floor Plan EL. 386'-0"	N
E-703, Sheet 6 of 17	Distributive Antenna System Radix Routing Plan Floor Plan EL. 404'-0"	N
E-703, Sheet 7 of 17	Distributive Antenna System Radix Routing Stairwell No. 1	N
E-703, Sheet 8 of 17	Distributive Antenna System Radix Routing Stairwell No. 5	N
E-703, Sheet 9 of 17	Distributive Antenna System ISOMETRIC ELEV. 386'- 0" COAX Routing	N
E-703, Sheet 10 of 17	Distributive Antenna System ISO-Administration BLDG. Routing	N
E-703, Sheet 11 of 17	Distributive Antenna System ISO-EL. 368'-0" Coax Routing Splitter 'D' to Gen. Room	N
E-703, Sheet 12 of 17	Distributive Antenna System ISO EL. 368'-0" Coax Routing Splitter "D" to Gen. Room	N
E-703, Sheet 13 of 17	Distributive Antenna System ISO EL. 368'-0" Coax Routing Controlled Access to Splitter "T"	N
E-703, Sheet 14 of 17	Distributive Antenna System ISO EL. 317'-0" & 354'-0" COAX Runs from Stairwell No. 1	N
E-703, Sheet 15 of 17	Distributive Antenna System ISO EL. 354'-0" COAX Routing Splitter "D" to WTR. Treating	N
E-703, Sheet 16 of 17	Distributive Antenna System ISO EL. 335'-0" + 404'-0" COAX Routing Splitter "X" to Pipe Area	N
E-703, Sheet 17 of 17	Distributive Antenna System ISO EL. 335'-0" + 404'-0" COAX Routing Splitter "Y" to Pipe Area	N
E-2001, Sheet 1	Station Single Line	35
E-2005, Sheet 1	Single Line meter & Relay Diagram, 4160 Volts System Engineered Safety Features	30

E-2006, Sheet 1	Low Voltage Safety Power Supplies, Single Line Diagram	44
E-2008, Sheet 1	Single line Meter & Relay Diagram 480 Volt Load Centers Engineered Safety Features & main Supply	29
E-2017, Sheet 1	Single Line Meter and Relay Diagram 125V DC 2003 (Black)	51
E-2022, Sheet 1	120 Volt A.C. Engineered Safety Features and 125 Volt D.C Power Distribution Panels	31
E-2028, Sheet 1	125V DC Distribution Panels 480V AC Pressurizer Heater Distribution Panels	24
E-2191, Sheet 1	Schematic Diagram 2B5 Pressurizer Proportional Heater Bank Control	23
E-2191, Sheet 1A	Schematic Diagram 2B6 Pressurizer Proportional Heater Bank Control	07
E-2209, Sheet 1	Schematic Diagram Shutdown Cooling Return Header Isolation Valve 2CV-5084-1	22
E-2209, Sheet 1A	Schematic Diagram Shutdown Cooling Return Header Isolation Valve 2CV-5086-2	05
E-2212, Sheet 1	Schematic Diagram Shutdown Cooling Outer Containment Isolation MOV 2CV5038-1	15
E-2218, Sheet 1	Schematic Diagram Refueling Water Tank Outlet Valve 2CV-5630-1	20
E-2218, Sheet 1A	Schematic Diagram Refueling Water Tank Outlet Valve 2CV5631-2	07
E-2299, Sheet 1A	Schematic Diagram EFW Pump 2P7A Discharge Isolation Valves 2CV1037-1 and 2CV1039-1 Auxiliary Relays	1
E-2299, Sheet 1	Schematic Diagram EFW Pump 2P7A Discharge Isolation Valves 2CV1036-1 Auxiliary Relays	15
E-2299, Sheet 2	Schematic Diagram EFW Pump Discharge Isolation Valves 2CV1026-2 and 2CV1076-2 Auxiliary Relays	9
E-2299, Sheet 3	Schematic Diagram EFW Pump Discharge Isolation	08
E-2300, Sheet 1	Schematic Diagram EFW System Discharge Valves	14

E-2563, Sheet 7	Schematic Diagram Safety Signal Actuated MOV's Thermal Overload Bypass	13
E-2563, Sheet 3	Schematic Diagram Safety Signal Actuated MOV's Thermal Overload Bypass	17
E-2861	Conduit & Tray Layout Containment Auxiliary Building Area 24 Elevation 386'-0"	80
E-2864	Conduit & Tray Layout Containment Auxiliary Building Area 24 & 26 Elevation 317'-0"	44
E-2866	Conduit & Tray Layout Containment Auxiliary Building Area 24 Elevation 354'-0"	64
E-2882	Conduit & Tray Layout Containment Auxiliary Building Area 26 Elevation 354'-0" & 360'-0"	46
E-2891	Conduit & Tray Layout Containment Auxiliary Building Elevation 336'-0"	35
E-2892	Cable Spreading Room Conduit Layout at Elevation 372'-0"	45
E-2904, Sheet 1 of 2	Distributive Antenna System RADIAX Communication System Riser Scheme	3
E-2904, Sheet 2 of 2	Distributive Antenna System Cable Numbering Scheme	5
E-2905, Sheet 1 of 20	Distributive Antenna System RADIAX Cable Routing Pan @ EL. 317'-0"	N
E-2905, Sheet 2 of 20	Distributive Antenna System RADIAX Cable Routing Pan @ EL. 335'-0"	N
E-2905, Sheet 3 of 20	Distributive Antenna System RADIAX Cable Routing Pan @ EL. 354'-0"	N
E-2905, Sheet 4 of 20	Distributive Antenna System RADIAX Cable Routing Pan @ EL. 368'-0"	N
E-2905, Sheet 5 of 20	Distributive Antenna System RADIAX Cable Routing Pan @ EL. 386'-0"	N
E-2905, Sheet 6 of 20	Distributive Antenna System RADIAX Cable Routing Pan @ EL. 404'-0"	N

E-2905, Sheet 7 of 20	Distributive Antenna System RADIAX Routing Stairwell No. 2001	N
E-2905, Sheet 8 of 20	Distributive Antenna System RADIAX Cable Routing Stairwell No. 2055	N
E-2905, Sheet 9 of 20	Distributive Antenna System Isometric Elev. 386'-0" COAX Routing	N
E-2905, Sheet 10 of 20	Distributive Antenna System Isometric Elev. 386'-0" COAX Routing N. Elec. Pen. & Corridor	N
E-2905, Sheet 11 of 20	Distributive Antenna System Isometric Elev. 368'-0" COAX Routing Splitter "C" to Outside Ant.	N
E-2905, Sheet 12 of 20	Distributive Antenna System Isometric Elev. 368'-0" COAX Routing Splitter "C" to Gen. Room	N
E-2905, Sheet 12 of 20	Distributive Antenna System Isometric Elev. 368'-0" COAX Routing Splitter "C" to Gen. Room	N
E-2905, Sheet 13 of 20	Distributive Antenna System Isometric Elev. 368'-0" COAX Routing Splitter "C" to Gen. Room	N
E-2905, Sheet 14 of 20	Distributive Antenna System Isometric Elev. 354'-0" COAX Routing Splitter "C" to Demineralizer Area & Elev. 335'-0"	N
E-2905, Sheet 15 of 20	Distributive Antenna System Isometric Elev. 386'-0" COAX Routing Splitter "J" to Controlled Access Corridor Elev. 404'-0" Chemical Storage	N
E-2905, Sheet 16 of 20	Distributive Antenna System Isometric Elev. 404'-0" COAX Routing Splitter "A" to Fuel Handling Deck	N
E-2905, Sheet 17 of 20	Distributive Antenna System Isometric Elev. 404'-0" COAX Routing Fuel Handling Deck to Outside Antenna	N
E-2905, Sheet 18 of 20	Distributive Antenna System Isometric Elev. 354'-0" COAX Routing Splitter "K" to Penetration Rm.	N
E-2905, Sheet 19 of 20	Distributive Antenna System Isometric Elev. 335'-0" COAX Routing Splitter "N" to Piping Area	N
E-2905, Sheet 20 of 20	Distributive Antenna System Isometric Elev. 335'-0" & 317'-0" COAX Routing Splitter "N" to Piping Area	N
FB-2098-6, Sheet 1	Fire Barrier Penetration Cable Spreading Room	1

FB-2098-2, Sheet 2	Fire Barrier Penetration Cable Spreading Room	2
FP-2101, Sheet 1	Fire Zones, Operating Floor Plan Elevation 404'-0" and 422'-0"	18
FP-2102, Sheet 1	Fire Zone, Fuel Handling Floor Plan Elevation 386'-0"	35
FP-2103, Sheet 1	Fire Zones, Intermediate Floor Plan Elevation 368'-0" and 372'-0"	32
FP-2104, Sheet 1	Fire Zone, Ground Floor Plan Elevation 354'-0"	33
FP-2105, Sheet 1	Fire Zone, Plan Below Grade Elevation 354'-0"	27
FP-2106, Sheet 1	Fire Zone, Plan at Elevation 317'-0"	16
FP-2108-2	Fire Barrier Penetration Electrical Equipment Room	2
M-406, Sheet 2	Functional Description & Logic Diagram Service Water Auxiliary Cooling & Fire Water System	17
M-2067-64	Fire Protection System Corridor 2139	3
M-2067-67	Fire Protection System Floor Elevation 317'-0"	2
M-2067-67-4	Fire Protection System Containment Building Auxiliary Building Operating Floor	10
M-2067-68	Fire Protection System Floor Elevation 335' Water Curtain Floor Elevation 354' Diesel Cooler Valve Area	2
M-2204, Sheet 4	Functional Description and Logic Diagram Emergency Feed water System	16
M-2236	Piping & Instrument Diagram, Containment Spray System	95
M-2232	Piping & Instrument Diagram, Safety Injection System	119
M-2403, Sheet 3	Functional Description and Logic Diagram Emergency Feed water System	16
M-2232, Sheet 1	Functional Description and Logic Diagram Safety Injection System	119
M-2236, Sheet 1	Functional Description and Logic Diagram Containment Spray System	16

M-2230, Sheet 2	Functional Description and Logic Diagram REACTOR Coolant system	44
M-2403, Sheet 1	Piping and Instrument Diagram Emergency Feed water System	16
M 2418, Sh 2	Functional Description and Logic Diagram Safety Injection System	11
M 2422, Sh 2	Functional Description and Logic Diagram Containment Spray System	16
M 2416, Sh 3	Functional Description and Logic Diagram Reactor Coolant System	11
M-2231 Sheet 1	Piping & Instrumentation Diagram Chemical & Volume Control System	143
M-2231 Sheet 2	Piping & Instrumentation Diagram Chemical & Volume Control System	77
S-100-16A-E-66, Sheet1	One Line Diagram Admin UPS System	New
77-21-E-14	Administrative Building Expansion II 208 Volt Panel Schedules	18
6600-M32-22-8	Schematic Wiring Diagram for Model 68 Control	8

ENGINEERING INFORMATION RECORDS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ER-ANO-2005-0443-024	Revision of Unit 2 Fire Zone to Fire Area Relationships in PDMS	0
ER-003053N201	Fusible Link Door Closer for U-2 Control Room / Printer Door	0
ER-ANO-2004-0195-000	ANO-1 & 2 Alternate Communication System	0
ER-ANO-2004-0857-000	Telephone Cable Fire Damage in Fire Area B	0
ER-ANO-2004-0660-000	Turbine Building Fire Impact on Plant Radio and Telephone System	0
ER 010149E301	Adequacy of Portable Radios During Alternate Shutdown Scenario	0

FIRE PROTECTION PROGRAM CHANGE EVALUATIONS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC 0000000477	Evaluation of Alternative Compensatory Measures for NFPA-805 Issues	0
EC 0000013772	Fire Protection Engineering Evaluation For Unit 2 Penetration Seals: Fireflex and Fire Zones JJ & EE	0
EC 0000020945	ANO Fire Water System Hydraulic Model	0
EC 0000024604	NFPA 72 Code Compliance Engineering Reports In Support of Transition to NFPA 805	0
EC 0000024611	Evaluate Change of EDG Room Flame Detector Sensitivity / Delay Including Flame Detectors UD-621 Thru UD-632	0
EC 0000025555	NFPA 13 Code Compliance Engineering report, Non-Compliance Resolution	0
EC 0000025686	ANO Code Compliance Report For NFPA 14 – Rev 1, Standpipes and Hose Stations	0
EC 0000025766	Resolution of A-2600 Penetration Seal Detail 78, 79 & 80 Issues Penetration Seals 2118-01-0200, 2118-01-0295 and 2118-01-0302	0
EC 0000025977	NFPA 20 Code Non-Compliance Justification To NFPA 805	0
EC 0000026514	ANO code Compliance Report For NFPA 14 – Rev 2, Standpipes and Hose Systems Non-Compliance Justification	0
EC 0000027153	NFPA 50A Code Compliance Engineering Report	0
EC 0000030582	NFPA 600 Code Compliance Engineering Report In Support of ANO Transition To NFPA 805	0
EC 0000031077	Revise PDMS to Associate Cables R2D2309A and R2D2390B With 2B5 and Cables G2D2409A and G2D2409B With 2B6	0
EC 0000035009	Fire Protection Engineering Evaluation For Unit 2 Penetration Seals: Fireflex And Fire Zones JJ & EE	0
EC 0000036496	Fire Protection Engineering Evaluation For U2 Penetration 2104-07-0007	0

LESSON PLANS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
A1LPLOPSECB5b1301	Security Event (B5b)	0
A2LP-AO-ASDO	Alternate Shutdown Operator	0
A2LPLOPARDSD1205	AOP-Alternate/Remote Shutdown/Walkdown	0
A2LPPOPSB5B1303	B5b Training	2
A2LP-RO-AAS	Alternate Shutdown AOP	1
A2QC-AO-ASDO	Unit 2 Alternate Shutdown Operators Qualification Guide	0

MODIFICATIONS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
DCP 83-D-2037A	Unit 2 Intake Structure Fire Suppression System	0

PROCEDURES

<u>Number</u>	<u>Title</u>	<u>Revision</u>
COPD-013	Operations Maintenance Interface Standards and Expectations	42
COPD-024	Risk Assessment Guidelines	46
EN-DC-125	Fire Brigade Drills	1
EN-DC-127	Control of Hot Work and Ignition Sources	12
EN-DC-161	Control of Combustibles	7
EN-DC-330	Fire Protection Program	1
EN-OP-115	Conduct of Operations	14
EN-TQ-125	Fire Brigade Drills	1
EM-WM-101	On-Line Work Management Process	10
EM-WM-104	On Line Risk Assessment	7

OP-1000.120	ANO Fire Impairment Program	22
OP-1003.005	Fire Prevention Inspection	13
OP-1003.014	ANO Fire Protection Program	6
OP-1015.07	Fire Brigade Organization and Responsibilities	25
OP-1063.020	Fire Brigade Training Program	16
OP-1104.032	Fire Protection Systems	69 & 71
OP-1203.009	Fire Protection System Annunciator Corrective Action	28
OP-1203.048	Security	21
OP-1306.027	Unit 1 K-5 Diesel Fire Pump engine Surveillance Inspection	22
OP-1403.190	Temporary Power to the Administration Building	008
OP-1416.038	Siemens Vacuum Circuit Breaker Preventive Maintenance	8
OP-1416.040	Magne-Blast Circuit Breaker Maintenance	15
OP-1416.041	Magne-Blast Circuit Breaker Overhaul	18
OP-1416-050	Unit 1&2 1AC51A and 1AC51B Relay Test Instruction	5
OP-1416-064	Unit 1 & 2 HFC11B and HFC21B Relay Test Instructions	4
OP-1903.062	Communications System Operating Procedure	25
OP-2104.032	Unit 2 Fire Protection system Operations	32
OP-2104.036	Emergency Diesel Generator Operation	84
OP-2105.008	Steam Dump and Bypass Control System Operations	27
OP-2107.001	Electrical Systems Operations	101
OP-2203.009	Fire Protection System Annunciator Corrective Action	23
OP-2203.014	Alternate Shutdown	26
OP-2203.034	Fire or Explosion	14

OP-2203.049	Fires In Areas Affecting Safe Shutdown	9
OP-2306.023	Fire Damper Surveillance Test	6
OP-2306.025	Unit 2 Fire Door Inspection Procedure	11
OP-2307.012	Unit 2 Fire Detection Instrumentation Operability	46
OP-2307.041	Unit 2, 1-Hour Cable Fire Wrap Inspection	2
OP-2307.042	Unit 2 3-Hour Cable Fire Wrap and Fire Retardant Coating Surveillance	2
OP-2405.016	Unit 2 Penetration fire Barrier Visual Inspection	15
OP-2416.401	Unit 2 Cubicle 2A401 Switchgear Maintenance	3

VENDOR DOCUMENTS

<u>Number</u>	<u>Title</u>	<u>Revision</u>
TDE353 0040	Catalog for Exide Electronics Emergency Lighting	1
TDG499X0030	Installation, Operating Instructions for GNB Technologies MSB Marathon & Sprinter Batteries, Model – M12V30, M12V40, M12V70, M12V90 & M6V180	0
Technical Data K131.0020	Installation, Operation and Maintenance Manual Automatic Control For Engine Driven Fire Pumps	1

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MISCELLANEOUS DOCUMENTS

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
Arkansas Nuclear One Letter 0CAN078202	Arkansas Nuclear One – Unit 1 and 2, Dockets Nos. 50-313 & 50-368, License Nos. DPR-51 & NFP-6, Results of Appendix R Compliance Review	July 1, 1982
Arkansas Nuclear One Letter 0CAN078217	Arkansas Nuclear One – Unit 1 and 2, Dockets Nos. 50-313 & 50-368, License Nos. DPR-51 & NFP-6, Results of Appendix R Compliance Review	July 29, 1982

Arkansas Nuclear One Letter 0CAN108203	Arkansas Nuclear One – Unit 1 and 2, Dockets Nos. 50-313 & 50-368, License Nos. DPR-51 & NFP-6, Request for Additional Information To Appendix R Compliance Submittal	October 5, 1982
Arkansas Nuclear One Letter 0CAN118203	Arkansas Nuclear One – Unit 1 and 2, Dockets Nos. 50-313 & 50-368, License Nos. DPR-51 & NFP-6, Request for Additional Information To Appendix R Compliance Submittal	November 1, 1982
Arkansas Nuclear One Letter 0CAN118210	Arkansas Nuclear One – Unit 1 and 2, Dockets Nos. 50-313 & 50-368, License Nos. DPR-51 & NFP-6, Request For Additional Information to Appendix R Compliance Submittal	November 11, 1982
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Arkansas Nuclear One Unit 2 Technical Requirements Manual, Section 3.3.6	Fire Detection system Instrumentation	49
Arkansas Nuclear One Unit 2 Technical Requirements Manual, Section 3.7.1	Fire Suppression Water system	49

Arkansas Nuclear One Unit 2 Technical Requirements Manual, Section 3.7.3	CPC Room Halon System	49
Arkansas Nuclear One Unit 2 Technical Requirements Manual, Section 3.7.4	Fire Hose Stations	49
Arkansas Nuclear One Unit 2 Technical Requirements Manual, Section 3.7.5	Fire Barriers	49
Arkansas Nuclear One Unit 2 Technical Requirements Manual, Section 3.8.6	Appendix R emergency Lighting	49
EN-FP-S-001-MULTI	Appendix R Emergency Lighting Units	0
EP-COR-LA-2013- 0007 20130107	Letter from London Rural Volunteer Fire Department; Dated Jan 7, 2013; Agreeing to provide firefighting support	NA
LIC-94-057	ANO Radio Communication System Commitments	Mar 8, 1994
NRC Letter J. Calvo to T. Campbell	Evaluation of Exemptions From The Technical requirements of Appendix R to 10 CFR Part 50 – Arkansas Nuclear One, Unit 2 (TAC No. 55668)	October 26, 1988
NRC Letter R. Clark/J. Stolz to J. Griffin	Exemptions to Certain Requirements of Appendix R to 10 CFR Part 50	March 22, 1983
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	Alternate Shutdown Technical Guidelines (AOP-2203.014)	26
	Arkansas Nuclear One Fire Hazards Analysis	15
	Maintenance Rule Performance Criteria Basis Document for the Appendix R Emergency Lighting	