



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

**REGION IV  
1600 EAST LAMAR BOULEVARD  
ARLINGTON, TEXAS 76011-4511**

April 30, 2019

Mr. Richard L. Anderson  
Site Vice President  
Entergy Operations, Inc.  
1448 S.R. 333  
Russellville, AR 72802-0967

**SUBJECT: ARKANSAS NUCLEAR ONE UNITS 1 AND 2 – NRC INTEGRATED  
INSPECTION REPORT 05000313/2019001 AND 05000368/2019001**

Dear Mr. Anderson:

On March 31, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Arkansas Nuclear One Units 1 and 2. On April 3, 2019, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented four findings of very low safety significance (Green) in this report. Three of these findings involved violations of NRC requirements.

If you contest the violations or significance of the violations documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement; and the NRC resident inspector at Arkansas Nuclear One.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at Arkansas Nuclear One.

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

Sincerely,

*/RA/*

Neil O'Keefe, Chief  
Reactor Projects Branch D

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

Enclosure:  
Inspection Report 05000313/2019001 and  
05000368/2019001  
w/attachment: Inservice Inspection  
Document Request

cc w/ encl:  
Electronic Distribution for Arkansas Nuclear One

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

Docket Numbers: 05000313 and 05000368

License Numbers: DPR-51 and NPF-6

Report Numbers: 05000313/2019001 and 05000368/2019001

Enterprise Identifier: I-2019-001-0005

Licensee: Entergy Operations, Inc.

Facility: Arkansas Nuclear One, Units 1 and 2

Location: Russellville, AR

Inspection Dates: January 1, 2019, to March 31, 2019

Inspectors: C. Henderson, Senior Resident Inspector  
T. DeBey, Resident Inspector  
T. Sullivan, Resident Inspector  
M. Tobin, Resident Inspector  
J. Drake, Senior Reactor Inspector

Approved By: Neil O'Keefe, Chief  
Reactor Projects Branch D  
Division of Reactor Projects

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a quarterly inspection at Arkansas Nuclear One Units 1 and 2 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. Findings, violations, and additional items being considered in the NRC's assessment are summarized in the tables below.

### List of Findings and Violations

Failure to Translate the Design Requirements into Instructions for Service Water System Sluice Gate Single Failure			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000313/2019001-01 Closed	None	71111.04
The inspectors identified a Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to translate design requirements for the Unit 1 service water system into instructions or procedures. Specifically, the plant was licensed to allow manual operator actions to compensate for a single failure of a service water sluice gate during a design basis event (e.g., loss of Lake Dardanelle), but the complex actions were never translated into a procedure.			

Welding Programmatic Issue			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000368/2019001-02 Open/Closed	[H.5] - Work Management	71111.08P
The inspectors identified a finding of very low safety significance and an associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion IX, "Control of Special Processes," for a failure to establish measures to assure that welding and nondestructive testing are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.			

Failure to Take Timely Corrective Actions for a Previously Identified Deficient Condition Associated with Bussmann HKA Fuse Holder Caps			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green FIN 05000313/2019001-03 Closed	[H.5] - Work Management	71152
The inspectors identified a self-revealed, Green finding associated with the licensee's failure to take timely corrective actions for potential failures identified through industry operating experience. Specifically, the licensee identified a failure mode of Bussmann Model HKA fuse holder caps through industry operating experience and through the corrective action program,			

determined that it was applicable to Arkansas Nuclear One, and created work orders to replace the susceptible fuse holder caps. However, these work orders were assigned the lowest possible priority in the work control system. An actual failure of a fuse cap occurred in the integrated control system which went undetected, and later prevented a runback from initiating when two out of three condensate pumps were no longer running. This resulted in the plant tripping instead of running back to 40 percent power.

Failure to Adequately Pre-Plan Maintenance that Affected Safety-Related Equipment			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000313/2019001-04 Closed	[H.12] - Avoid Complacency	71153
The inspectors identified a self-revealed, Green finding and associated non-cited violation of Arkansas Nuclear One, Unit 1, Technical Specifications 5.4.1.a, for the licensee's failure to properly preplan maintenance that can affect the performance of safety-related equipment. Specifically, the licensee failed to adequately evaluate the use of voltage test probes installed in the negative phase sequence relay within the A-112 unit auxiliary transformer feeder breaker to the A1 bus, which resulted in the loss of the nonsafety-related 4160 volt A1 bus and the automatic start of emergency diesel generator 1 to provide power to the safety-related 4160 volt A3 bus.			

#### Additional Tracking Items

Type	Issue number	Title	Inspection Procedure	Status
LER	05000313/2018-004-00	Reactor Trip Due to the Loss of a Non-Vital 4160 Volt Bus	71153 – Follow-up of Events and Notices of Enforcement Discretion	Closed

## PLANT STATUS

Unit 1 began the inspection period at full power. On February 4, 2019, power was lowered to 68 percent as requested by the transmission system operator to facilitate repairs on the 500 kV Mabelvale Line. Unit 1 was returned to full power on February 5, 2019.

Unit 2 began the inspection period at full power. On February 4, 2019, power was lowered to 75 percent as requested by the transmission system operator to facilitate repairs on the 500 kV Mabelvale Line. Unit 2 was returned to full power on February 5, 2019.

On March 15, 2019, Unit 1 lowered power to 60 percent as requested by the transmission system operator to facilitate repairs on the 500 kV Mabelvale Line. Unit 1 was returned to full power on March 16, 2019.

On March 15, 2019, Unit 2 lowered power to 18 percent to facilitate an oil leak repair of reactor coolant pump C and repairs on the 500 kV Mabelvale Line. Unit 2 was returned to full power on March 16, 2019.

## INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

## REACTOR SAFETY

### 71111.01 - Adverse Weather Protection

#### External Flooding Sample (IP Section 03.04) (1 Sample)

The inspectors evaluated readiness to cope with external flooding for the following areas:

- Unit 1 train bay hatch HTC-492 controls during resin transfer evaluations on February 18, 2019.

### 71111.04 - Equipment Alignment

#### Partial Walkdown (IP Section 02.01) (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Unit 1 and Unit 2 emergency cooling pond on January 25, 2019;

- (2) Unit 1 service water pump B aligned to train A service water system during service water bay A maintenance on January 28, 2019;
- (3) Unit 1 remote shutdown on February 1, 2019;
- (4) Unit 2 chemical volume and control system on February 15, 2019.

#### 71111.04S - Equipment Alignment

##### Complete Walkdown (IP Section 02.02) (1 Sample)

Unit 1 safety-related and nonsafety-related 4160 volt switchgear on March 31, 2019.

#### 71111.05Q - Fire Protection

##### Quarterly Inspection (IP Section 03.01) (6 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Unit 1 and Unit 2 alternate alternating current (AC) generator building on January 16, 2019;
- (2) Unit 1 intake structure during service water bay outage, Fire Area N, on January 18, 2019;
- (3) Unit 2 north electrical equipment room, Fire Area B-3, Zone 2091-BB, on February 11, 2019;
- (4) Unit 1 fire impairment for train bay hatch HTC-492, Fire Area B-1, Zone 197-X-5, on February 25, 2019;
- (5) Unit 2 2A3 switchgear room, Fire Area II, Zone 2101-AA, on February 25, 2019;
- (6) Unit 2 2A4 switchgear room, Fire Area SS, Zone 2100-Z, on February 25, 2019.

#### 71111.06 - Flood Protection Measures

##### Inspection Activities - Internal Flooding (IP Section 02.02a.) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

Unit 2 safety-related 4160 volt 2A3 and 2A4 switchgear rooms on March 5, 2019.

#### 71111.08P - Inservice Inspection Activities (PWR)

The inspectors evaluated nondestructive examination activities by observing the following activities or reviewing the following records:

##### 02.01 PWR Non-destructive Examination (NDE) Activities and Welding Activities (1 Sample)

The inspectors evaluated nondestructive examination activities by observing the following activities or reviewing the following records:

The inspectors evaluated pressurized water reactor nondestructive testing by observing and reviewing the following examinations from October 1, 2018, to January 3, 2019:

(1) Ultrasonic Examination

- a) Reactor coolant system, 28-018, pipe to elbow weld
- b) Reactor coolant system, 28-019, elbow to pipe weld

(2) Magnetic Particle Examination

- a) Reactor vessel head, 2P-55 flued head
- b) 2P-63 flued head
- c) 2P-65 flued head

(3) Visual Examination

- a) Steam generator, 2P-32C, lower scroll weld

(4) Dye Penetrant Examination

- a) Safety injection, 2P-32E, lugs

The inspectors evaluated the licensee's boric acid control program performance.

The steam generator tube inspections were not required to be performed in this outage.

The reactor vessel bare metal visual examination was not required this outage.

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01)  
(1 Sample)

Unit 1 and Unit 2 downpower due to grid operator request and return to rated thermal power on February 5, 2019.

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (2 Samples)

- (1) Unit 1 licensed operator requalification scenario on March 6, 2019;
- (2) Unit 2 just in time training for reactor plant downpower to 18 percent rated thermal power for reactor coolant pump C oil leak repair on March 10, 2019.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (4 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Unit 1 and Unit 2 alternate AC diesel generator on January 23, 2019;
- (2) Unit 1 and Unit 2 emergency cooling pond on January 31, 2019;
- (3) Unit 2 chemical volume and control system established goals and monitoring for multiple relay failures on February 4, 2019;
- (4) Unit 1 4160 volt safety-related switchgear on February 8, 2019.

#### 71111.13 - Maintenance Risk Assessments and Emergent Work Control

##### Risk Assessment and Management Sample (IP Section 03.01) (8 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Unit 2 emergent work for control element assembly system logic power supply failure on January 14, 2019;
- (2) Unit 1 Yellow risk window for service water pump A and diesel drive fire water pump unavailable for service water bay A maintenance on January 23, 2019;
- (3) Unit 1 and Unit 2 diesel fire water pump maintenance outage on January 31, 2019;
- (4) Unit 2 emergent work for an unplanned entry into an Orange risk window for train B containment spray and high pressure safety injection system recirculation function made unavailable on February 8, 2019;
- (5) Unit 2 planned Yellow risk window for containment spray pump B seal cooler maintenance on February 11, 2019;
- (6) Unit 1 emergent work for high pressure injection pump C failure to start on March 6, 2019;
- (7) Unit 1 and Unit 2 Yellow risk window power reductions to support Unit 2 reactor coolant pump C oil leak repair and 500 kV Mabelvale switching activities for tower repairs on March 15, 2019;
- (8) Unit 2 emergent work for train B service water pipe leak on the emergency control room chiller return header on March 28, 2019.

#### 71111.15 - Operability Determinations and Functionality Assessments

##### Sample Selection (IP Section 02.01) (7 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Unit 1 and Unit 2 emergency cooling pond operability during Unit 1 sluice gate 1 maintenance on January 23, 2019;

- (2) Unit 1 train A 4160 volt operability determination for an undervoltage relay that failed to actuate on January 23, 2019;
- (3) Unit 1 emergency diesel generator 1 and 2 exhaust fans compensatory measures incorporated into procedures on January 24, 2019;
- (4) Unit 1 and Unit 2 emergency cooling pond spillway operability on January 25, 2019;
- (5) Unit 2 motor driven emergency feedwater pump operability following re-installing leads on January 29, 2019;
- (6) Unit 2 2BS-1B operability following failure to meet surveillance testing acceptance criteria on February 14, 2019;
- (7) Unit 1 service water pump A operability with potential foreign material identified during service water bay A maintenance on February 14, 2019.

#### 71111.18 - Plant Modifications

##### Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Unit 2 temporary modification for steam generator B snubber reservoir catches inside containment on March 14, 2019;
- (2) Unit 1 and Unit 2 permanent modification for 4160 volt buses A1 and 2A1 from manual to automatic transfer to startup transformer 2 on March 31, 2019.

#### 71111.19 - Post Maintenance Testing

##### Post Maintenance Test Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Unit 1 and Unit 2 diesel fire pump preventive maintenance outage window on February 8, 2019;
- (2) Unit 1 train bay hatch HTC-492 post maintenance testing requirements following resin transfer on February 25, 2019;
- (3) Unit 1 sluice gate 1 maintenance activities during service water bay A maintenance outage window on March 1, 2019;
- (4) Unit 1 service water pump A maintenance activities during service water bay A maintenance outage window on March 1, 2019;
- (5) Unit 1 high pressure injection pump C post maintenance testing following breaker installation after pump failure to start on March 6, 2019;

- (6) Unit 2 reactor coolant pump C oil leak repair post maintenance testing on March 19, 2019.

#### 71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

##### In Service Testing (IST) (IP Section 03.01) (1 Sample)

Unit 1 sluice gate 1 leak rate surveillance testing on February 14, 2019.

##### Reactor Coolant System (RCS) Leak Detection (IP Section 03.01) (1 Sample)

Unit 1 unidentified reactor coolant system leak rate increasing to Tier 3 action levels on February 19, 2019.

##### Surveillance Testing (IP Section 03.01) (4 Samples)

- (1) Unit 1 reactor protection system channel C monthly surveillance testing on March 14, 2019;
- (2) Unit 2 axial shape index (ASI) surveillance during unit down power to 18 percent rated thermal power on March 15, 2019;
- (3) Unit 2 2BS-1B check closure inservice surveillance testing on March 17, 2019;
- (4) Unit 2 emergency diesel generator 1 18-month surveillance testing (fast start and 24-hour run) on March 20, 2019.

#### 71114.06 - Drill Evaluation

##### Drill and/or Simulator-Based Licensed Operator Requalification Training (IP Section 02.01) (see 71114.06 for sample guidance) (1 Sample)

The inspectors evaluated:

Unit 2 anticipated transient without a scram and fuel damage on February 6, 2019.

### **OTHER ACTIVITIES – BASELINE**

#### 71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

##### IE01: Unplanned Scrams per 7000 Critical Hours Sample (IP Section 02.01) (2 Samples)

- (1) Unit 1 (January 1, 2018, through December 31, 2018)
- (2) Unit 2 (January 1, 2018, through December 31, 2018)

IE03: Unplanned Power Changes per 7000 Critical Hours Sample (IP Section 02.02)  
(2 Samples)

- (1) Unit 1 (January 1, 2018, through December 31, 2018)
- (2) Unit 2 (January 1, 2018, through December 31, 2018)

IE04: Unplanned Scrams with Complications (USwC) Sample (IP Section 02.03)  
(2 Samples)

- (1) Unit 1 (January 1, 2018, through December 31, 2018)
- (2) Unit 2 (January 1, 2018, through December 31, 2018)

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (IP Section 02.03) (2 Samples)

The inspectors reviewed the licensee’s implementation of its corrective action program related to the following issues:

- (1) Unit 1 and Unit 2 Bussmann fuse holder failures and operating experience on March 6, 2019;
- (2) Unit 1 and Unit 2 important to safety relay failures on March 7, 2019.

71153 - Followup of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (1 Sample)

The inspectors evaluated the following licensee event report which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

- (1) LER 05000313/2018-004-00, Reactor Trip Due to the Loss of a Non-Vital 4160 Volt Bus, (ADAMS Accession: ML19049A011):

The inspectors concluded that no violation of NRC requirements occurred.

**INSPECTION RESULTS**

Failure to Translate the Design Requirements into Instructions for Service Water System Sluice Gate Single Failure			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000313/2019001-01 Closed	None	71111.04
The inspectors identified a Green finding and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” for the licensee’s failure to translate design requirements for the Unit 1 service water system into instructions or procedures. Specifically, the plant was licensed to allow manual operator actions to compensate for a single failure of a service water sluice gate during a design basis event (e.g., loss of Lake Dardanelle), but the complex actions were never translated into a procedure.			

Description: The inspectors reviewed Unit 1 Procedure OP-1203.025, “Natural Emergencies,” Revision 67, Procedure OP-1203.030, “Loss of Service Water,” Revision 26, and the current licensing and design basis for the service water system prior to the licensee aligning service water pump B to the train A service water system. From this review, the inspectors identified the following:

The Unit 1 safety analysis report (SAR) states that the service water system was required to operate during and following certain natural phenomenon (e.g. loss of Lake Dardanelle). It further describes the single failure analysis for the service water system which credits and describes the operator actions required if a sluice gate fails to open or close (information is contained in SAR Table 9-11, “Single Failure Analysis – Service Water System”). However, the inspectors were unable to locate the instructions discussed in SAR Table 9-11 in Procedure OP-1203.025 or Procedure OP-1203.030. When questioned, the licensee concluded that there were no instructions that would implement the sluice gate single failure operator actions contained in SAR Table 9-11. The licensee entered this deficiency into the corrective action program as Condition Report CR-ANO-1-2019-00155. This condition could challenge operators when responding to a sluice gate failure. Inspectors determined that the delay in correctly aligning the seven sluice gates could allow some loss of emergency cooling pond (ECP) water inventory, but operators were still expected to be able to make the alignment change without challenging the safety function.

Corrective Action(s): The immediate action was to update Procedure OP-1203.025, “Natural Emergencies,” Revision 68, to incorporate the sluice gate single failure design requirements contained in SAR Table 9-11.

Corrective Action Reference(s): CR-ANO-1-2019-00155

Performance Assessment:

Performance Deficiency: The licensee’s failure to assure that service water system design requirements were translated into instructions, procedures, or drawings is a performance deficiency. Specifically, operator manual actions credited to meet the design requirement to ensure that a single failure of a sluice gate will not prevent the safety function of the service water system were described in the SAR but were not translated into a procedure.

Screening: The performance deficiency was more than minor, and therefore a finding, because it was associated with the procedural quality attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee’s failure to translate service water system sluice gate single failure design into instructions would have complicated operator response during a design basis event (e.g. loss of Lake Dardanelle) to maintain service water system capability.

Significance: Using Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it: (1) was not a design deficiency; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time; and (4) did not result in the loss of a high safety-significant, nontechnical specification train.

Cross-cutting Aspect: A cross-cutting aspect was not assigned to this finding because the performance deficiency occurred during initial construction, and therefore, is not indicative of current licensee performance.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, from initial licensing until January 2019, the licensee failed to establish measures to assure that applicable regulatory requirements and the design basis, as defined in 50.2 and as specified in the license application for the Unit 1 service water system design, was correctly translated into specifications, drawings, procedures, and instructions. Specifically, the licensee failed to translate the operator manual actions credited to meet single failure design requirements for the Unit 1 service water system sluice gate into instructions or procedures.

Disposition: This violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy, because it was very low safety significance (Green) and was entered into the licensee's corrective action program as Condition Report CR-ANO-1-2019-00155.

Welding Programmatic Issue

Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000368/2019001-02 Open/Closed	[H.5] - Work Management	71111.08P

The inspectors identified a finding of very low safety significance and an associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion IX, "Control of Special Processes," for a failure to establish measures to assure that welding and nondestructive testing are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

Description: The inspectors reviewed the licensee's Weld Program Document EN-DC-328, "Entergy Nuclear Welding Program," Revision 4, and the associated procedures. The inspectors noted that licensee Procedure CEP-WP-003, "Qualification and Control of Welders," Revision 2, requires that all welders shall be qualified in accordance with the applicable construction code, qualification code, and any supplemental requirements contained in engineering and licensing documents. In addition, licensee Procedure CEP-WP-004, "Control and Documentation of Welding Activities," Revision 4, requires the following of the welding supervisor:

1. Assign qualified welders to welding activities after determining a welder's qualification status by reviewing the Welder Qualification and Continuity Report;
2. Review the welding package with assigned welders during pre-job briefings;

3. Provide an appropriate level of direction and oversight to welders while performing welding activities;
4. Review the welding package including the referenced welding process specifications with the assigned welder(s) during the pre-job brief;
5. Ensure that the qualification status of assigned welders is verified during the pre-job brief using an up-to-date welder.

The welder/lead welder is instructed to maintain cognizance of his/her qualifications using the Welder Qualification and Continuity Report, which is issued by the site welding engineer in accordance with Procedure CEP-WP-003.

In accordance with licensee Procedure CEP-WP-005, "Control and Issuance of Welding Material," Revision 1, the site welding coordinator ensures that welding material is controlled and issued in accordance with applicable procedures, and provides training to welders, issue station attendants, and personnel authorized to approve weld material requisitions. This procedure also requires that the welding supervisor assign welders to welding activities and determine the correct welding material to be used based on review of the applicable weld procedure, determine a welder's qualification status prior to requisitioning welding material from the issue station, and initiate weld material requisitions or authorizes welders to initiate their own weld material requisitions for assigned welding activities. The weld material request approver approves weld material requisitions prior to requisition of welding material from issue stations.

Notwithstanding these welding program requirements, the following adverse trends and conditions were noted by inspectors:

- On September 16, 2018, Unit 2 main feedwater train B drain line valve failed at weld FW-9C2, resulting in a steam leak upstream of drain valves 2FW-1005A/B. The valve had been replaced during the recent refueling outage in 2017. The failure resulted in a manual trip and unplanned outage to complete repairs. The licensee's investigation determined there was evidence of poor welding practices, including grinding on the pipe and filing directly below weld FW-9C2. Personnel had not followed Fleet General Welding Standard CEP-WP-GWS-1, "General Welding Standard ASME/ANSI," Revision 3, since there was less than adequate worker oversight and direction, and a lack of welder proficiency testing.
- On January 24, 2016, Unit 1 reactor coolant loop A pump discharge valve vent line had a failure of the socket weld that was installed during the 2015 refueling outage. The failure resulted in reactor coolant system pressure boundary leakage more than the technical specification allowed leak rate. The licensee inserted a manual trip and entered a forced outage to complete repairs. The licensee determined that the weld did not meet the requirements on the design drawing and that the quality control inspection should have identified the nonconforming weld.
- On three separate occasions, personnel who were not qualified welders in accordance with the licensee's weld program, were assigned to work orders, obtained welding materials from issue stations, and welded on American Society of Mechanical Engineers (ASME) Code components in the plant. The valves had to be removed and reinstalled using qualified welders.

As noted in these examples and contrary to the welding program requirements, personnel that were not qualified as welders in accordance with the licensee's weld program procedures, were assigned to weld packages, issued welding material from the issue stations, and welded on ASME code components in the plant on multiple occasions. In addition, quality assurance personnel failed to identify rejectable indications on two welds that resulted in the failure of the welds and shutdown of the reactor to repair. During the licensee's root cause analysis for the failed welds, which was performed under Condition Report CR-ANO-C-2018-01846, the licensee noted that maintenance leadership did not recognize the impacts of not having a site welding coordinator/supervisor and that this condition was previously noted in Adverse Condition Analysis (ACA) CR-ANO-2-2017-05335, which contained a corrective action to: "Identify and designate a full-time Entergy employee as the Site Welding Coordinator to assume the responsibilities from the currently designated contractor." This was an opportunity for the licensee to detect and avert these deficiencies in the welding program.

Corrective Action(s): The plant was shutdown and repairs were made. A review of the welding program was performed and a program improvement plan was implemented.

Corrective Action Reference(s): CR-ANO-1-2018-03567, CR-ANO-1-2018-03729, CR-ANO-2-2016-01071

Performance Assessment:

Performance Deficiency: The licensee's failure to establish measures to assure that welding and nondestructive testing are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements is a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the human performance attribute of the Initiating Events Cornerstone. It adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, personnel not qualified as welders in accordance with the licensee's weld program procedures were assigned to complete weld packages, issued welding material from the issue stations, and welded on ASME code components in the plant on multiple occasions. In addition, quality assurance personnel failed to identify rejectable indications on two welds that resulted in the failure of the weld and shutdown of the reactor to repair. Furthermore, the inspectors determined that this was a programmatic issue since multiple departments and multiple levels of workers and management were responsible for the inadequate measures, which included procedures, training, and oversight, to assure that welding and nondestructive testing were controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements.

Significance: The inspectors assessed the significance of the finding using Appendix A, "Significance Determination of Reactor Inspection Findings for At - Power Situations." The inspectors reviewed the initiating events screening questions in Exhibit 1 and determined the finding to be of very low safety significance (Green) because after a reasonable assessment of degradation the leak would not have exceeded the reactor coolant system leak rate for a small-break loss-of-coolant accident (LOCA) and the leak would not have affected other systems used to mitigate a LOCA (e.g., an interfacing system LOCA).

Cross-cutting Aspect: H.5 - Work Management: The organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work and the need for coordination with different groups or job activities. Specifically, the organization failed to implement a process of planning, controlling, and executing work activities such that nuclear safety was the overriding priority.

Enforcement:

Violation: Title 10 CFR Part 50, Appendix B, Criterion IX, "Control of Special Processes," requires, in part, that the licensee establish measures to assure that welding and nondestructive testing are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements. Contrary to the above, between March 2017, and October 2018, the licensee failed to maintain measures to assure that welding and nondestructive testing were controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements. Specifically, the measures implemented by the licensee failed to prevent personnel who were not qualified as welders in accordance with the licensee's weld program procedures from being assigned to weld packages, being issued welding material from the issue stations, and welding on ASME code components in the plant on multiple occasions. In addition, quality assurance personnel failed to identify rejectable indications on two welds that resulted in the failure of the weld and shutdown of the reactor to repair.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Take Timely Corrective Actions for a Previously Identified Deficient Condition Associated with Bussmann HKA Fuse Holder Caps

Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green FIN 05000313/2019001-03 Closed	[H.5] - Work Management	71152

The inspectors identified a self-revealed, Green finding associated with the licensee's failure to take timely corrective actions for potential failures identified through industry operating experience. Specifically, the licensee identified a failure mode of Bussmann Model HKA fuse holder caps through industry operating experience and through the corrective action program, determined that it was applicable to ANO, and created work orders to replace the susceptible fuse holder caps. However, these work orders were assigned the lowest possible priority in the work control system. An actual failure of a fuse cap occurred in the integrated control system (ICS) which went undetected, and later prevented a runback from initiating when two out of three condensate pumps were no longer running. This resulted in the plant tripping instead of running back to 40 percent power.

Description: On December 18, 2018, the licensee was conducting Baker testing on the train A main chiller motor (VCH-1A) for Arkansas Nuclear One (ANO) Unit 1. While restoring from the Baker testing, an electric arc occurred while removing a voltage test probe from the negative phase sequence relay in switchgear cubicle A-112 (unit auxiliary transformer feeder breaker to the nonvital 4160 volt A1 bus). The arc caused fuses in this circuit to open to protect the control power transformer for the A1 bus. The resulting under voltage condition

caused the unit auxiliary feeder breaker to A1 (A-112) to trip and de-energize the A1 bus. The loss of the A1 bus caused a loss of power to the 4160 volt safety bus A3, causing the automatic start of the red train emergency diesel generator, which restored power to the A3 bus. The A1 bus did not initially transfer to the startup 1 transformer because the main generator was still on line. When the A1 bus de-energized, the A and C condensate pumps de-energized. With only one condensate pump running, a "Loss of 2 Condensate Pump ICS" runback should have actuated. However, the ICS runback feature did not actuate due the latent failure of the Bussmann Model HKA fuse cap. The plant ultimately tripped on high reactor coolant system pressure and operators safely stabilized the plant in Mode 3. The inspectors concluded that the plant trip was a direct result of the Bussmann Model HKA fuse cap failure, and not as a result of the loss of power to the A1 bus.

The inspectors noted that Condition Report CR-ANO-1-2017-00241 was generated by the licensee on January 23, 2017, to address the operating experience related to Bussmann HKA fuse holder circuits. This condition report states, "Multiple instances have been documented within the nuclear industry regarding plant trips, runbacks, and 'phantom' SASS (Smart Automatic Signal Selector) mis-match events resulting from aged, degraded Bussmann HKA cap/light indicators. The spring in the body of the orange fuse cap/indicating lamp is prone to recession into the body of the cap as it is compressed and relaxed repeatedly throughout its life. As a result, the fuse may become loose within the fuse holder, and intermittently open the circuit that it is used for." The 2017 condition report directed the generation of work orders to address all Bussmann HKA fuse holder cap applications within both ANO Unit 1 and Unit 2 to inspect and/or replace Bussmann HKA fuse holder caps. Although Work Order (WO) 494514 was generated to replace the Bussmann HKA fuse holder cap that failed in the ICS system, the work order was not implemented, and the fuse holder cap was not replaced until after Unit 1 had tripped in December 2018 via WO 514989.

Additionally, the inspectors noted that a failure of a Bussmann HKA fuse holder cap occurred prior to this event and was documented in Condition Report CR-ANO-1-2018-00044, dated January 4, 2018, associated with the TT-2679 'B' feedwater loop temperature transmitter for non-nuclear instrumentation (NNI) cabinet 'Y'. The Bussmann HKA fuse holder cap failure mechanism for the transmitter was identical to the Bussmann HKA fuse holder cap failure mechanism for the ICS system, and to the operating experience discussed in Condition Report CR-ANO-1-2017-00241 (aged/degraded cap spring). The licensee successfully replaced the Bussmann HKA fuse holder cap for the transmitter via WO 492254-01, restoring the transmitter to service. Although the January 2018 condition report made reference to the January 2017 condition report, no action was taken to consider the timeliness of the previous corrective action plan.

The inspectors determined that none of the work orders generated by Condition Report CR-ANO-1-2017-00241, which addressed all safety-related and nonsafety-related Bussmann HKA fuse holder cap applications within both units at ANO, were implemented prior to December 18, 2018. Instead, these work orders were prioritized with the lowest priority that exists in the work management system.

The inspectors concluded that the licensee failed to recognize the potential risk associated with failure of some of the fuse holders of concern. In particular, fuse holders that could fail such that the failure would not be recognized created a latent condition. In the case of the ICS failure, the latent condition would only be recognized during an event, and the failure would (and did) prevent a design feature from mitigating the severity of the event.

The inspectors identified that Procedure EN-LI-102, "Corrective Action Program," paragraph 5.9.1.a provides the following; "Responsibility for monitoring and reporting on the status of WOs that have CRs/CAs closed to them resides with the production department. This monitoring is to ensure timely correction of the originally identified condition. Periodically, typically at least monthly, report to the PRG the status of WOs with CRs/CAs closed to them. The focus of this report should be the monitoring for timely resolution of those work orders per Procedure EN-WM-100. The PRG may require additional details for any WOs not completed in a timely manner." Procedure EN-WM-100, "Work Request (WR) Generation, Screening and Classification," states the following; "Work Requests and Work Orders are assigned a priority based upon the significance of the condition identified."

Contrary to these statements, the licensee failed to take timely corrective actions for a previously identified deficient condition to inspect and/or replace the Bussmann HKA fuse holder cap in the ICS system, and did not assign the appropriate priority based upon the significance of the condition identified. This led to a plant trip and challenged safety-related systems.

Corrective Action(s): The licensee replaced the degraded fuse holder cap within the ICS system. The licensee also checked for proper voltage in the C46-1 panel to ensure the health of the eight fuse holder caps that directly power auxiliary relays for plant runback features. All eight were verified to be providing the appropriate voltage.

Corrective Action Reference(s): CR-ANO-1-2018-05360

Performance Assessment:

Performance Deficiency: The licensee's failure to take timely corrective actions for operating experience that was applicable to the plant associated with Bussmann HKA fuse holder caps is a performance deficiency.

Screening: The performance deficiency was more than minor, and therefore a finding, because it was associated with the human performance attribute of the Initiating Events Cornerstone to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee's failure to replace old Bussmann HKA fuse holder caps with a known age-related failure mechanism in a timely manner resulted in the failure of the "Loss of 2 Condensate Pump ICS" runback feature that was designed to avoid a plant trip. The loss of power to the A1 bus combined with the nonfunctional runback resulted in a plant trip.

Significance: Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the inspectors determined that the finding had very low safety significance (Green) because it did cause a reactor trip by itself, but did not cause a loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

Cross-cutting Aspect: The finding had a cross-cutting aspect in the area of human performance associated with work management because the licensee failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the implementation of the work orders was not prioritized commensurate with the safety significance of the systems within which Bussmann HKA fuse holder caps are used in accordance with Procedure EN-WM-100, "Work Request (WR) Generation, Screening and Classification." In general, those systems which would not

failsafe if a Bussmann HKA fuse holder cap failed, should have been identified during the risk evaluation process, the work order prioritization process, and the work management process.

Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding. Specifically, the failure of the ICS fuse holder and the earlier failures did not involve safety-related or quality systems.

**Failure to Adequately Pre-Plan Maintenance that Affected Safety-Related Equipment**

Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000313/2019001-04 Closed	[H.12] - Avoid Complacency	71153

The inspectors identified a self-revealed, Green finding and associated non-cited violation of Arkansas Nuclear One, Unit 1, Technical Specifications 5.4.1.a, for the licensee's failure to properly preplan maintenance that can affect the performance of safety-related equipment. Specifically, the licensee failed to adequately evaluate the use of voltage test probes installed in the negative phase sequence relay within the A-112 unit auxiliary transformer feeder breaker to the A1 bus, which resulted in the loss of the nonsafety-related 4160 volt A1 bus and the automatic start of emergency diesel generator 1 to provide power to the safety-related 4160 volt A3 bus.

Description: On December 18, 2018, the licensee was conducting Baker testing on the train A main chiller motor. While restoring from the Baker testing, an electric arc occurred while removing a voltage test probe from the A-112 unit auxiliary transformer feeder breaker to the A1 bus. The current from the arc opened fuses that caused an under voltage protective relay to open the unit auxiliary feeder breaker to A-1 (A-112), de-energizing the A1 bus. The loss of the A1 bus caused a loss of power to the 4160 volt safety bus A3, causing the automatic start of the emergency diesel generator (EDG) 1, which restored power to the A3 bus. The A1 bus did not initially transfer to the startup one transformer because the main generator was still on line.

Due to an unrelated fault in the integrated control system (ICS), the plant did not immediately run-back to 40 percent reactor power as designed and tripped instead. The inspectors determined that the loss of the A1 bus did not directly cause a reactor trip by itself; therefore, the loss of the A1 bus and the plant trip were evaluated as separate events. Other than the fault in the ICS system, the plant responded as designed during the trip, and the operators safely stabilized the plant in Mode 3.

The licensee entered this issue into their corrective action program as Condition Report CR-ANO-1-2018-05311 and performed an apparent cause evaluation. The apparent cause evaluation identified several causal factors which contributed to the loss of the A1 bus. The individual tasked with removing the voltage test probe was not the individual briefed for installing or removing test equipment from the A1 bus. Also, the pre-job risk review focused mainly on the possibility of losing the opposite train main chiller and the potential for a plant trip due to loss of cooling water to reactor building cooled components and did not consider the possibility that the A1 bus may also be adversely impacted. Additionally, as recently as September 2018, and additionally in prior correspondence, the licensee was evaluating the replacement of terminal block screws with threaded banana jack adapters, which would allow testing and maintenance to be performed more safely and efficiently.

The inspectors identified that the licensee's on-line risk assessment Procedure EN-WM-104, "On Line Risk Assessment," Revision 18, addresses work with the potential for an electrical transient, including blown fuses. Specifically, Procedure EN-WM-104, Attachment 3, "Integrated Risk," step 10, defines work with the potential for an electrical transient to include work being performed on energized conductors, lifting energized electrical leads, active troubleshooting in a live AC/DC circuit where a short, daisy chain, blown fuse, open circuit could cause unwanted system actuation and/or isolation. Although the operations impact statement mentioned work being performed within the A-112 unit auxiliary feeder breaker to A-1, there was no mention of any adverse impact to the A1 bus as a result of the electrical maintenance being performed.

Corrective Action Reference: CR-ANO-1-2018-05311

Corrective Actions: The licensee implemented corrective actions which centered around adding more oversight of all plant electrical work activities, testing, calibration, or trouble shooting that requires use of non-engineered test points, jumper installations, or lifted leads while the system is still in service, and if the actions have a potential to cause a plant trip, plant transient, or entry into a limiting condition for operation. The corrective actions included developing work orders and scheduling the installation of engineering test points during bus outages and safety system panel outage windows.

Performance Assessment:

Performance Deficiency: The licensee's failure to properly pre-plan maintenance involving the use of voltage test probes installed in the negative phase sequence relay within the A-112 unit auxiliary transformer feeder breaker to the A1 bus which had the potential to impact safety-related equipment is a performance deficiency.

Screening: The performance deficiency was more than minor, and therefore a finding, because it was associated with the human performance attribute of the Initiating Events Cornerstone to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee failed to recognize that the use of voltage test probes installed in the negative phase sequence relay within the A-112 unit auxiliary transformer feeder breaker to the A1 bus created the potential to cause a plant transient that challenged safety-related equipment. The loss of the A1 bus resulted in a temporary loss of the safety-related A3 bus, which was reenergized by EDG 1.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, and determined that the finding screened to Green because it did not by itself cause a reactor trip or the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

Cross-cutting Aspect: The finding had a cross-cutting aspect in the area of human performance associated with avoiding complacency because the licensee failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Specifically, the licensee relied upon past successful outcomes, which resulted in not adequately evaluating risk or implementing required risk management actions, such as the installation of engineered test points, thorough review of planned activities, and a pre-job brief for all participating personnel.

Enforcement:

Violation: Technical Specification 5.4.1.a for Unit 1 requires, in part, that written procedures be established, implemented, and maintained covering the applicable procedures in Appendix A to Regulatory Guide 1.33, "Quality Assurance Program Requirements," Revision 2, February 1978. Regulatory Guide 1.33, Appendix A, Section 9.a, states, in part, that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings to the circumstances. Procedure EN-WM-104, "On-Line Risk", step 4.4, states the following: "Perform integrated risk assessments of emergent equipment out of service/unplanned maintenance conditions as soon as practical utilizing Attachment 3, Integrated Risk. Apply a risk informed approach to mitigation of emergent conditions and prioritize recovery of plant systems utilizing Attachment 3, Integrated Risk." Attachment 3, "Integrated Risk," step 10, defines work with the potential for an electrical transient to include work being performed on energized conductors, lifting hot leads, active troubleshooting in a live AC/DC circuit where a short, daisy chain, blown fuse, open circuit could cause unwanted system actuation and/or isolation."

Contrary to the above, on December 18, 2018, the licensee failed to properly preplan maintenance that can affect the performance of safety-related equipment. Specifically, the licensee failed to adequately evaluate the risk of using voltage test probes installed in the negative phase sequence relay within the A-112 unit auxiliary transformer feeder breaker to the A1 bus as required by Procedure EN-WM-104, Attachment 3. This condition led to a plant transient that challenged safety-related equipment. The loss of the A1 bus, which resulted in a temporary loss of the safety-related A3 bus, was reenergized by EDG 1.

Disposition: This violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy, because it was of very low safety significance (Green) and was entered into the licensee's corrective action program as Condition Report CR-ANO-1-2018-05311.

## **EXIT MEETINGS AND DEBRIEFS**

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

- On January 4, 2019, the inspector presented the inservice inspection results to Mr. J. Kirkpatrick, General Manager Plant Operations, and other members of the licensee staff.
- On April 3, 2019, the inspector presented the quarterly resident inspector inspection results to Mr. R. Anderson, Site Vice President, and other members of the licensee staff.

## DOCUMENTS REVIEWED

### 71111.01 – Adverse Weather Protection

#### Condition Reports (CR-ANO-)

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1-2019-00256	1-2019-00420	C-2019-00241	C-2019-00252
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Procedures Number	Title	Revision
OP-1015.052	Passive Barrier Breach Permitting Process	1

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Engineering Reports Number	Title	Revision
EC-58310	Review of Opening Hatch HTC-492 during Normal Operation for HELB and Flooding Concerns Identified in CR-ANO-C-2015-01888	0

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Calculations Number	Title	Revision
CALC-95-R-0024-01	Basic Requirements for the Component Database on Station Doors and Hatches	16

### 71111.04 – Equipment Alignment

#### Condition Reports (CR-ANO-)

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1-2016-04750	1-2019-00155	2-2019-00316	C-2013-01248	C-2019-00177
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#### Work Orders

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51660885	52759974
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Procedures Number	Title	Revision
OP-1104.029	Service Water and Auxiliary Cooling System	119
OP-1203.002	Alternate Shutdown	29
OP-1203.025	Natural Emergencies	67, 68
OP-1203.029	Remote Shutdown	13
OP-1203.030	Loss of Service Water	26
OP-1411.084	Unit 1 Sluice Gate and S.W. Bay Cleaning and Inspection	16
OP-2102.010	Plant Cooldown	59
OP-2104.029	Service Water System Operations	113
OP-2105.014	Safety Parameter Display System	18
OP-2202.001	Standard Post Trip Actions	16
OP-2202.010	Standard Attachments	29

Procedures Number	Title	Revision
OP-2203.012L	Annunciator 2K12 Corrective Action	52
OP-2203.013	Natural Circulation Operations	18
OP-2203.014	Alternate Shutdown	35
OP-2203.030	Remote Shutdown	16
OP-2203.036	Loss of Charging	14

Drawings Number	Title	Revision
M-209, Sheet 1	Piping and Instrument Diagram Circ. Water, Service Water, and Fire Water Intake Equipment	115
M-2210	Piping and Instrument Diagram, Service Water System	91

Miscellaneous Documents Number	Title	Revision
1CAN068403	ANO-1	
DCP 80-2123L		
STM 2-76	Safety Parameter Display System	13

Calculations Number	Title	Revision
CALC-91-E-0099-10	ECP Peak Temperature and Inventory Loss Analysis Summary	3
CALC-91-E-0099-14	ECP Peak Temperature Analysis and Inventory Loss Analysis Summary	2

71111.05 – Fire Protection

Condition Reports (CR-ANO-)

1-2019-00256	2-2018-04398	2-2019-00285	C-2019-00241	C-2019-00252
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Procedures Number	Title	Revision
OP-1000.120	ANO Fire Impairment Program	25
OP-2203.049	Fires in Areas Affecting Safe Shutdown	18
OP-2405.016	Unit 2 Penetration Fire Barrier Visual Inspection	23

Miscellaneous Documents Number	Title	Revision
1B-ADD-Unit 1	Intake Structure	5
3-AACGB		3

Miscellaneous Documents		
Number	Title	Revision
PFP-U2	Unit 2 Prefire Plan	17

71111.06 – Flood Protection Measures

Condition Reports (CR-ANO-)

1-2019-00256	2-2015-02369	2-2019-00476	C-2019-00241	C-2019-00252
C-2019-00621	C-2015-01888	C-2015-01929		

Procedures		
Number	Title	Revision
OP-1015.052	Passive Barrier Breach Permitting Process	1
OP-2104.029	Service Water System Operations	113
OP-2104.035	Ventilation System Operations	45
OP-2203.012E	Annunciator 2K05 Corrective Actions	41
OP-2203.012F	Annunciator 2K06 Corrective Actions	40
OP-2203.012K	Annunciator 2K11 Corrective Actions	50
OP-2203.022	Loss of Service Water	15
OP-2203.051	Internal Flooding	7

Miscellaneous Documents		
Number	Title	Revision
ULD-0-TOP-17	ANO Flooding	1

Engineering Reports		
Number	Title	Revision
EC-58301	Review of Opening Hatch HTC-492 During Normal Operation for HELB and Flooding Concerns Identified in CR-ANO-C-2015-01888	0
EC-63132	Evaluate Internal Flooding Effects Due to CW Pipe Break or Rupture on the Unit 1 AND Unit 2 Turbine Buildings CR-ANO-C-2016-00873	0
EC-74710	HELB Doors and Hatches Documents Clean-Up	0

Calculations		
Number	Title	Revision
CALC-15-E-0007-12	Switchgear Rooms 2100 and 2101 Ponding Evaluation	0
CALC-83-D-2057-01	Corridor 2104 – Maximum Depth of Ponding after Drainage Upgrade	5
CALC-83-D-2181-	Summary Calc. – Flooding Depth due to Fire Protection	4

Calculations Number	Title	Revision
01	Discharge and Know Elevations of Safety Related Electrical Equipment	
CALC-95-R-0024-01	Basic Requirements for the Component Database on Station Doors and Hatches	16
CALC-ANOC-CS-15-00003	ANO Flood Protection Design Basis	8
CALC-ANOC-CS-15-00012	ANO Flood Protection Room Evaluations – Unit 1 and 2	1

71111.08 – Inservice Inspection Activities

Condition Reports (CR-ANO-)

2-2015-03210	2-2015-04604	2-2017-01631	2-2017-01694	2-2017-03138
2-2017-04838	2-2018-01275	2-2018-02092	2-2018-02225	2-2018-02366
2-2018-02377	2-2018-02498	2-2018-02546	C-2017-01783	C-2018-00634
C-2018-02215	C-2018-03783			

Work Orders

00436151	00510132	52770764	52774467
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Procedures Number	Title	Revision
CEP-BAC-001	Boric Acid Corrosion Control (BACC) Program Plan	1
CEP-CII-003	Visual Examinations Of Class MC Components	307
CEP-NDE-0404	Manual Ultrasonic Examination of Ferritic Piping Welds (ASME XI)	7
CEP-NDE-0423	Manual Ultrasonic Examination of Austenitic Piping Welds (ASME XI)	8
CEP-NDE-0478	Manual Ultrasonic Examination of Reactor Pressure Vessel Welds (Section XI App. VIII)	2
CEP-NDE-0493	Manual Ultrasonic Examination of Reactor Coolant Pump Flywheel	4
CEP-NDE-0641	Liquid Penetrant Examination (FT) for ASME Section XI	8
CEP-NDE-0731	Magnetic Particle Examination (MT) for ASME Section XI	6
CEP-NDE-0901	VT-1 Examination	6
CEP-NDE-0903	VT-3 Examination	6
CEP-NDE-0955	Visual Examination (VE) of Bare-Metal Surfaces	305
CEP-WP-002	Qualification, Development, and Control of Welding Procedure Specifications	1
CEP-WP-003	Qualification and Control of Welders	2
CEP-WP-004	Control and Documentation of Welding Activities	4

Procedures Number	Title	Revision
CEP-WP-005	Control and Issuance of Welding Material	1
CEP-WP-006	Review and Approval of Vendor Welding Programs	1
CEP-WP-GBS-1	General Brazing Standard	1
CEP-WP-GWS-1	General Welding Standard ASME/ANSI	2
CEP-WP-GWS-2	General Welding Standard Structural Steel AWS D1.1	2
CEP-WP-GWS-3	General Welding Standard Structural Stainless Steel, AWS D1.6	1
CEP-WP-GWS-4	General Welding Standard Sheet Metal AWS D9.1	1
CEP-WP-GWS-5	General Welding Standard Stud Welding	1
CEP-WP-IGP-1	Internal Gas Purging	1
CEP-WP-PHT-1	Preheat and Postweld Heat Treatment Requirements	2
CEP-WP-RBMD-1	Repair of Base Material Defects	1
CEP-WP-WIIR-1	Weld Inprocess Inspection Requirements	3
EN-DC-328	Entergy Nuclear Welding Program	4
EN-DC-319	Boric Acid Corrosion Control Program (BACCP)	11
EN-DC-340	Microbiologically Influenced Corrosion (MIC) Monitoring Program	5
EN-LI-104	Entergy EN-DC-174 Engineering Program Section – ASME Section XI Repair and Replacement and Containment Repair and Replacement	11
SEP-BAC-ANO- 001	Boric Acid Corrosion Control Program Inspection and Identification of Boric Acid Leaks for ANO-1 and ANO-2	2

#### 71111.11 – Licensed Operator Requalification Program

##### Condition Reports (CR-ANO-)

C-2019-00379

Procedures Number	Title	Revision
OP-1102.004	Power Operations	
OP-1104.002	Makeup and Purification System	95
OP-1203.045	Rapid Plant Shutdown	20
OP-2104.004	Power Operation	65
OP-2203.053	Rapid Power Reduction	5
OP-2203.054	Abnormal Grid	2

##### Miscellaneous Documents

##### Title

Scenarios: Internal ICS Failure and Steam Generator Tube Rupture

71111.12 – Maintenance Effectiveness

Condition Reports (CR-ANO-)

1-2018-02847	1-2018-02855	2-2018-00310	2-2018-00529	2-2018-01480
2-2018-01530	2-2018-01743	2-2018-01785	2-2018-01981	2-2018-02003
C-2013-01248	C-2017-02826	C-2017-03230	C-2017-03293	C-2018-00050
C-2018-00519	C-2018-02179	C-2018-02540	C-2018-02925	C-2018-04735

Work Orders

432811	506082	51660885
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Procedures

Number	Title	Revision
EN-WM-105	Planning	23
OP-1305.029	Off-Site Power Undervoltage and Protective Relay Test	15
OP-2104.029	Service Water System Operations	113
OP-2305.001	Integrated Engineering Safeguards Test	32

Drawings

Number	Title	Revision
M-2210	Piping and Instrument Diagram, Service Water System	91

Miscellaneous Documents

Number	Title	Revision
ER-ANO-1999-1559-004	Load Sequencing Timer Replacement Project	0

71111.13 – Maintenance Risk Assessments and Emergent Work Control

Condition Reports (CR-ANO-)

1-2019-00085	1-2019-00160	1-2019-00228	1-2019-00484	1-2019-00494
2-2019-00047	2-2019-00328	2-2019-00780		

Work Orders

515654	516198	513375	519804	52719206	52759974	52774476
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Procedures

Number	Title	Revision
OP-1104.029	Service Water and Auxiliary Cooling System	119
OP-1104.032	Sup 2, Surveillance Test of Diesel Fire Pump (P-6B)	90
OP-1307.004	Diesel Fire Pump Engine (K-5) Biannual Surveillance	13
OP-1411.084	Unit 1 Sluice Gate and S.W. Bay Cleaning and Inspection	16
OP-2104.036	Emergency Diesel Generator Operations	98

Procedures Number	Title	Revision
OP-2105.009	CEDM Control System Operation	41
OP-2203.012J	Annunciator 2K10 Corrective Action	45

Drawings Number	Title	Revision
M-209, Sheet 1	Piping and Instrument Diagram Circ. Water, Service Water, and Fire Water Intake Equipment	115
M-2210	P&ID Service Water System	

Miscellaneous Documents Number	Title	Revision
2-ONLI-SW-02	Tagout	
COPD-024	Risk Assessment Guidelines	67
EN-OP-119	Protected Equipment Postings	10
EN-WM-104	On-Line Risk Assessment	18

71111.15 – Operability Determinations and Functionality Assessments

Condition Reports (CR-ANO-)

1-2018-02847	1-2018-02855	1-2018-04294	1-2018-05007	1-2019-00139
1-2019-00140	1-2019-00141	1-2019-00144	1-2019-00154	1-2019-00157
1-2019-00160	2-2018-04446	2-2019-00328	C-2019-00310	

Work Orders

516688	52759974
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Procedures Number	Title	Revision
OP-1104.029	Service Water and Auxiliary Cooling System	119
OP-1104.036	Emergency Diesel Generator Operation	80
OP-1305.02	Off-site Power Undervoltage and Protective Relay Test	15
OP-1306.037	Surveillance Testing for Unit 1 Sluice Gates SG-1 and SG-2	4
OP-1411.084	Unit 1 Sluice Gate and S.W. Bay Cleaning and Inspection	16
ULD-0-TOP-03	ANO Unit 1 and Unit 2 Seismic	4

Drawings Number	Title	Revision
E-2294, Sheet 1	Schematic Emergency Feedwater Motor Driven Pump 2P7B Control	16

Drawings Number	Title	Revision
E-2613	4160VAC Switchgear (GE Unit 011) ACB 2A311 EFW Motor Driven Pump 2P7B	3
M-209, Sheet 1	Piping and Instrument Diagram Circ. Water, Service Water, and Fire Water Intake Equipment	115

Miscellaneous Documents Number	Title
PIF 2-19-0001	Procedure Improvement Form

Engineering Reports Number	Title	Revision
EC 0000000443	Emergency Cooling Pond Spillway Replacement	0

Calculations Number	Title	Revision
CALC-11-E-0006- 01		2
CALC 83-D-1007- 06	Mech Calc for Seismic Updgrade of Firewater Header Intake Structure	3
CALC-91-E-0099- 10	ECP Peak Temperature and Inventory Loss Analysis Summary	3
CALC-91-E-0099- 14	ECP Peak Temperature Analysis and Inventory Loss Analysis Summary	2
CALC-M-3600-37- 1		

#### 71111.18 – Plant Modifications

Condition Reports (CR-ANO-)		
2-2018-04028	2-2018-04506	2-2019-00673

Work Orders
513000

Procedures Number	Title	Revision
EN-MA-133	Control of Scaffolding	19
OP-1015.036	Containment Closeout	56
OP-2202.003	Loss of Coolant Accident	15
OP-2202.010	Standard Attachments	29

Engineering Reports Number	Title	Revision
EC 81620	"B" Steam Generator Snubber and Snubber Reservoir Catches Review; Containment Impact Review	0, 1

Calculations Number	Title	Revision
CALC-A-13	Containment Heat Sinks	1
CALC-A-22	Containment Net Free Internal Volume	5
CALC-A-132	Steam Generator Sub Compartment Pressure Analysis	0
CALC-07-E-0016-01	Accountability of Unit 2 Containment Strainers Sacrificial Surface Area	2

71111.19 – Post Maintenance Testing

Condition Reports (CR-ANO-)

1-2019-00137	1-2019-00160	1-2019-00228	1-2019-00248	1-2019-00256
1-2019-00420	1-2019-00484	1-2019-00494	2-2019-00701	2-2019-00718
2-2019-03580	C-2019-00241			

Work Orders

517696	519804	531000	52719206	52759974	52843223
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Procedures Number	Title	Revision
OP-1015.036	Containment Building Closeout	56
OP-1015.052	Passive Barrier Breach Permitting Process	1
OP-1104.032	Sup 2, Surveillance Test of Diesel Fire Pump (P-6B)	90
OP-1306.037	Surveillance Test for Unit 1 Sluice Gate SG-1 and SG-2	4
OP-1307.004	Diesel Fire Pump Engine (K-5) Biannual Surveillance	13
OP-1402.240	Inspection of Watertight Hatches	2
OP-1411.084	Unit 1 Sluice Gate and Service Water Bay Cleaning and Inspection	16

Engineering Reports Number	Title	Revision
EC-13224	ANO-2 Service Water Pump 2P-4B SS Wet End Upgrade	0
EC-18616	Clarify Dimensions of Isolating Gasket Fit to Discharge Cone and Pump Bowl and Acceptance Criteria for Electrical Isolation	0
EC-54098	Document the Purpose of the Dielectric Gasket Between the Wet Ends and Columns	0

71111.22 – Surveillance Testing

Condition Reports (CR-ANO-)

1-2011-00184	1-2011-00585	1-2011-01070	1-2015-01741	1-2018-01970
2-1997-00229	2-2017-03771	2-2017-06022	2-2019-00328	2-2019-00336

Work Orders

52680501	527192016
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Procedures

Number	Title	Revision
OP-1015.003B	Unit 2 Operations Logs	80
OP-1104.029	Service Water and Auxiliary Cooling System	119
OP-1304.039	Reactor Protection System Test	
OP-1306.037	Surveillance Testing for Unit 1 Sluice Gates SG-1 and SG-2	4
OP-1411.084	Unit 1 Sluice Gate and S.W. Bay Cleaning and Inspection	16
OP-2104.005	Containment Spray	8

Drawings

Number	Title	Revision
M-209, Sheet 1	Piping and Instrument Diagram Circ. Water, Service Water, and Fire Water Intake Equipment	115

Miscellaneous Documents

Number	Title	Revision
ER-ANO-2002-1285-00	Service Water Boundary Valve Leakage Criteria	0
PIF 2-18-0017		
PMRQ/PMID 50016233		
SEP-ANO-1-IST-1	ANO Unit 1 Inservice Testing Bases Document	4
SEP-ANO-1-IST-2	Inservice Testing Plan Site Engineering Program Section	5
SEP-ANO-1-IST-3	Inservice Testing Cross Reference Document	2

Calculations

Number	Title	Revision
CALC-91-E-0099-10	ECP Peak Temperature and Inventory Loss Analysis Summary	3
CALC-91-E-0099-14	ECP Peak Temperature Analysis and Inventory Loss Analysis Summary	2

71152 – Problem Identification and Resolution

Condition Reports (CR-ANO-)

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1-2017-00241	1-2018-02847	1-2018-02855	1-2018-05360	1-2019-00484
1-2019-00494	1-2019-00531			

Work Orders

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514989	520790
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Procedures

Number	Title	Revision
OP-1305.029	Off-Site Power Undervoltage and Protective Relay Test	15

Miscellaneous Documents

Number	Title
IN-87-62	Mechanical Failures of Indicating-Type Fuses
NUREG 1760	Aging Assessment of Safety Related Fuses Used in Low and Medium Voltage Applications in Nuclear Power Plants
Part 21	Cracked Ferrules Accession #9612170255

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Information Request  
September 17, 2018  
Notification of Inspection and Request for Information  
Comanche Peak Unit 2  
NRC Inspection Report 05000446/2018004

**INSERVICE INSPECTION DOCUMENT REQUEST**

Inspection Dates: November 26 to December 7, 2018  
Inspector: Jim Drake, Senior Reactor Inspector

A. Information Requested for the In-Office Preparation Week

The following information should be sent to the Region IV office in hard copy or electronic format ([ims.certrec.com](mailto:ims.certrec.com) preferred), in care of Jim Drake, by November 2, 2018, to facilitate the selection of specific items that will be reviewed during the onsite inspection week. The inspector will select specific items from the information requested below and then request from your staff additional documents needed during the onsite inspection week. Please provide requested documentation electronically if possible. If requested documents are large and only hard copy formats are available, please inform the inspector(s), and provide subject documentation during the first day of the onsite inspection.

If you have any questions regarding this information request, please call the inspector as soon as possible.

On November 26, 2018, a reactor inspector from the Nuclear Regulatory Commission's (NRC) Region IV office will perform the baseline inservice inspection at Comanche Peak Unit 2, using NRC Inspection Procedure 71111.08, "Inservice Inspection Activities." Experience has shown that this inspection is a resource intensive inspection both for the NRC inspector and your staff. The date of this inspection may change dependent on the outage schedule you provide. In order to minimize the impact to your onsite resources and to ensure a productive inspection, we have enclosed a request for documents needed for this inspection. The information identified on this request (Section A) is to be provided prior to the inspection to ensure that the inspector(s) are adequately prepared. The section identified as "Documents Upon Request" is intended to provide guidance to the type of information an inspector(s) will be requesting to complete the inspection. It is important that all of these documents are up to date and complete in order to minimize the number of additional documents requested during the preparation and/or the onsite portions of the inspection (i.e., condition reports with attachments).

We have discussed the schedule for these inspection activities with your staff and understand that our regulatory contact for this inspection will be Mr. James Barnette of your licensing organization. The tentative inspection schedule is as follows:

Preparation week: November 13 - 16, 2018

Onsite weeks: November 26 – December 7, 2018

Our inspection dates are subject to change based on your updated schedule of outage activities. If there are any questions about this inspection or the material requested, please contact Jim Drake at (817) 200-1558 (email to: James.Drake@nrc.gov).

#### A.1 ISI/Welding Programs and Schedule Information

1. A detailed schedule (including preliminary dates) of:

1.1. Nondestructive examinations planned for ASME Code Class Components performed as part of your ASME Section XI, risk informed (if applicable), and augmented inservice inspection programs during the upcoming outage.

1.2. Examinations planned for Alloy 82/182/600 components that are not included in the Section XI scope (If applicable)

1.3. Examinations planned as part of your boric acid corrosion control program (Mode 3 walkdowns, bolted connection walkdowns, etc.)

1.4. Welding activities that are scheduled to be completed during the upcoming outage (ASME Class 1, 2, or 3 structures, systems, or components)

2. A copy of ASME Section XI Code Relief Requests and associated NRC safety evaluations applicable to the examinations identified above.

2.1. A list of ASME Code Cases currently being used to include the system and/or component the Code Case is being applied to.

3. A list of nondestructive examination reports which have identified recordable or rejectable indications on any ASME Code Class components since the beginning of the last refueling outage. This should include the previous Section XI pressure test(s) conducted during start up and any evaluations associated with the results of the pressure tests.

4. A list including a brief description (e.g., system, code class, weld category, nondestructive examination performed) associated with the repair/replacement activities of any ASME Code Class component since the beginning of the last outage and/or planned this refueling outage.

5. If reactor vessel weld examinations required by the ASME Code are scheduled to occur during the upcoming outage, provide a detailed description of the welds to be examined and the extent of the planned examination. Please also provide reference numbers for applicable procedures that will be used to conduct these examinations.

6. Copy of any 10 CFR Part 21 reports applicable to structures, systems, or components within the scope of Section XI of the ASME Code that have been identified since the beginning of the last refueling outage.
7. A list of any temporary non-code repairs in service (e.g., pinhole leaks).
8. A copy of (or ready access to) most current revision of the inservice inspection program manual and plan for the current interval.
9. Copy of NDE procedures for NDE that will be used during the outage.
10. Copy of overarching site procedure for welding.
11. Provide evaluation of operating experience associated with CRDM thermal sleeve wear issue.

#### A.2 Reactor Pressure Vessel Head (If Being Inspected, otherwise N/A)

1. Provide a detailed scope of the planned bare metal visual examinations (e.g., volume coverage, limitations, etc.) of the vessel upper head penetrations and/or any nonvisual nondestructive examination of the reactor vessel head including the examination procedures to be used.
  - 1.1. Provide the records recording the extent of inspection for each penetration nozzle including documents which resolved interference or masking issues that confirm that the extent of examination meets 10 CFR 50.55a(g)(6)(ii)(D).
  - 1.2. Provide records that demonstrate that a volumetric or surface leakage path examination assessment was performed.
2. Copy of current calculations for EDY, and RIY as defined in Code Case N-729-1 that establish the volumetric and visual inspection frequency for the reactor vessel head and J-groove welds.

#### A.3 Boric Acid Corrosion Control Program

1. Copy of the procedures that govern the scope, equipment and implementation of the inspections required to identify boric acid leakage and the procedures for boric acid leakage/corrosion evaluation.
2. Please provide a list of leaks (including code class of the components) that have been identified since the last refueling outage and associated corrective action documentation. If during the last cycle, the unit was shutdown, please provide documentation of containment walkdown inspections performed as part of the boric acid corrosion control program.

#### A.4 Steam Generator Tube Inspections

1. A detailed schedule of:
  - Steam generator tube inspection, data analyses, and repair activities for the upcoming outage.

- Steam generator secondary side inspection activities for the upcoming outage .
2. Copy of steam generator history documentation given to vendors performing eddy current (ET) testing of the steam generators during the upcoming outage.
  3. Copy of steam generator condition monitoring and operational assessment of previous cycle. Also include a copy of the following documents as they become available for the current cycle:
    - Degradation assessment
    - Condition monitoring assessment
  4. Define the planned steam generator ET scope (e.g., 100 percent of unrepaired tubes with bobbin probe and 20 percent sample of hot leg expansion transition regions with rotating probe) and identify the scope expansion criteria, which will be applied.
  5. Identify and quantify any steam generator tube leakage experienced during the previous operating cycle. Also provide documentation identifying which steam generator was leaking and corrective actions completed and planned for this condition.
  6. Copy of steam generator eddy current data analyst guidelines and site validated eddy current technique specification sheets. Additionally, please provide a copy of EPRI Appendix H, "Examination Technique Specification Sheets," qualification records.
  7. Copy of the guidance to be followed if a loose part or foreign material is identified in the steam generators.
  8. Provide past history of the condition and issues pertaining to the secondary side of the steam generators (including items such as loose parts, fouling, top of tube sheet condition, crud removal amounts, etc.).

Indicate where the primary, secondary, and resolution analyses are scheduled to take place.

#### A.5 Additional Information Related to all Inservice Inspection Activities

1. A list with a brief description of inservice inspection, and boric acid corrosion control program related issues (e.g., CR) entered into your corrective action program since the beginning of the last refueling outage. For example, a list based upon data base searches using key words related to piping such as: inservice inspection, ASME Code, Section XI, NDE, cracks, wear, thinning, leakage, rust, corrosion, boric acid, or errors in piping examinations.
2. Provide training (e.g. scaffolding, fall protection, foreign material exclusion, confined space) if they are required for the activities described in A.1 through A.3.
3. Please provide names and phone numbers for the following program leads:

Inservice inspection (examination, planning)  
 Containment exams  
 Snubbers and supports

Repair and replacement program  
Licensing  
Site welding engineer  
Boric acid corrosion control program  
Steam generator inspection activities (site lead and vendor contact)

## DOCUMENTS UPON REQUEST

### Inservice Inspection / Welding Programs and Schedule Information

1. Updated schedules for inservice inspection/nondestructive examination activities, including planned welding activities, and schedule showing contingency repair plans, if available.
2. For ASME Code Class welds selected by the inspector please provide copies of the following documentation (as applicable) for each subject weld:
  - Weld data sheet (traveler).
  - Weld configuration and system location.
  - Applicable welding procedures used to fabricate the welds.
  - Copies of procedure qualification records (PQRs).
  - Welder's performance qualification records (WPQ).
  - Nonconformance reports for the selected welds (If applicable).
  - Radiographs of the selected welds and access to equipment to allow viewing radiographs (if radiographic testing was performed).
  - Preservice and inservice examination records for the selected welds.
  - Readily accessible copies of nondestructive examination personnel qualifications records for reviewing.
3. For ultrasonic examination procedures qualified in accordance with ASME Code, Section XI, Appendix VIII, provide documentation supporting the procedure qualification (e.g. the EPRI performance demonstration qualification summary sheets). Also, include qualification documentation of the specific equipment to be used (e.g., ultrasonic unit, cables, and transducers including serial numbers) and nondestructive examination personnel qualification records.

### Boric Acid Corrosion Control Program

1. Boric acid walk down inspection results, an updated list of boric acid leaks identified so far this outage, associated corrective action documentation, and overall status of planned boric acid inspections.

2. List of boric acid evaluation and corrective action documents associated with the leakage.

#### Steam Generator Tube Inspections

1. Examination technique specification sheets and associated justification for any revisions.
2. Copy of the eddy current testing procedures used to perform the steam generator tube inspections (specifically calibration and flaw characterization/sizing procedures, etc.).
3. Procedures with guidance/instructions for identifying (e.g. physically locating the tubes that require plugging) and plugging steam generator tubes.
4. List of corrective action documents generated by the vendor and/or site with respect to steam generator inspection activities.

#### Codes and Standards

1. Ready access to (i.e., copies provided to the inspector(s) for use during the inspection at the onsite inspection location, or room number and location where available):
  - Applicable editions of the ASME Code (Sections V, IX, and XI) for the inservice inspection program and the repair/replacement program.
2. Copy of the performance demonstration initiative (PDI) generic procedures with the latest applicable revisions that support site qualified ultrasonic examinations of piping welds and components (e.g., PDI-UT-1, PDI-UT-2, PDI-UT-3, PDI-UT-10, etc.).
3. Boric Acid Corrosion Guidebook Revision 1 – EPRI Technical Report 1000975.

ARKANSAS NUCLEAR ONE UNITS 1 AND 2 – NRC INTEGRATED INSPECTION  
 REPORT 05000313/2019001 AND 05000368/2019001 – April 30, 2019

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**ADAMS ACCESSION NUMBER: ML19122A484**

SUNSI Review      ADAMS:       Non-Publicly Available       Non-Sensitive      Keyword:  
 By: NO'Keefe       Yes     No       Publicly Available       Sensitive      NRC-002

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DATE	4/24/2019	4/24/2019	4/25/2019	4/24/2019	4/29/2015	4/29/2015
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