



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

February 4, 2014

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

SUBJECT: ARKANSAS NUCLEAR ONE - NRC INTEGRATED INSPECTION  
REPORT 050003 NRC's 13/2013005 AND 05000368/2013005

Dear Mr. Browning:

On December 31, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Arkansas Nuclear One Station, Units 1 and 2. On January 16, 2014, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. Both of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of these NCVs, 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, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Arkansas Nuclear One.

If you disagree with a cross-cutting aspect assignment 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 Regional Administrator, Region IV; and the NRC resident inspector at the Arkansas Nuclear One.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the

J. Browning

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NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Gregory E. Werner, Acting Branch Chief  
Project Branch E  
Division of Reactor Projects

Docket Nos.: 50-313, 50-368  
License Nos: DRP-51; NPF-6

Enclosure: Inspection Report 05000313/2013005 and  
05000368/2013005 w/ Attachments:

1. Supplemental Information
2. Request for Information for Occupational Radiation Safety  
Inspection, Arkansas Nuclear One, Units 1 and 2,  
December 9, 2013, through December 12, 2013,  
NRC Inspection Report 05000313/2013005; 05000368/2013005

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 05000313; 05000368

License: DPR-51; NPF-6

Report: 05000313/2013005; 05000368/2013005

Licensee: Entergy Operations Inc.

Facility: Arkansas Nuclear One, Units 1 and 2

Location: Junction of Hwy. 64 West and Hwy. 333 South  
Russellville, Arkansas

Dates: October 1 through December 31, 2013

Inspectors: B. Tindell, Senior Resident Inspector  
A. Fairbanks, Resident Inspector  
M. Young, Resident Inspector  
K. Clayton, Senior Operations Engineer  
L. Ricketson, P.E., Senior Health Physicist

Approved By: G. Werner, Acting Branch Chief  
Chief, Project Branch E  
Division of Reactor Projects

## SUMMARY

IR 05000313/2013005; 05000368/2013005; 10/01/2013 - 12/31/2013, Arkansas Nuclear One, Units 1 and 2, Integrated Inspection Report; Fire Protection and Operability Determinations and Functionality Assessments.

The inspection activities described in this report were performed between October 1, 2013, and December 31, 2013, by the resident inspectors at Arkansas Nuclear One and inspectors from the NRC's Region IV office. Two findings of very low safety significance (Green) are documented in this report. Both of these findings involved violations of NRC requirements. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Components Within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

### Cornerstone: Mitigating Systems

- Green. Inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to hang the fluorescent light fixture above the Unit 1 motor driven emergency feedwater pump in a seismically qualified design configuration. This was not an immediate safety concern because operability was adequately demonstrated when the misconfiguration was identified and because the licensee restored the light fixture to its seismically qualified configuration on November 12, 2013. The licensee entered this issue into their corrective action program as Condition Report CR-ANO-1-2013-02830.

Inspectors concluded that the licensee's failure to hang the fluorescent light fixture above the Unit 1 motor driven emergency feedwater pump in accordance with Drawing E-2060 was a performance deficiency. The performance deficiency was more than minor because it was associated with the design control attribute of the mitigating system cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Specifically, the licensee failed to ensure that, during a design basis seismic event, the light would not fall and adversely impact the safety-related pump below. Using Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, the inspectors determined that this finding was of very low safety significance (Green) because the finding was a deficiency affecting the design or qualification of mitigating equipment, in which the equipment maintained its operability; and did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic event.

The finding was determined to have a cross-cutting aspect in the area of human performance, associated with resources, for the licensee's failure to ensure that sufficient personnel were available for light inspections. Specifically, during the safety-related room inspections that were completed on August 27, 2013, the licensee failed to identify that the

light above the motor driven emergency feedwater pump was inappropriately hung, due to the hurried nature of the inspections [H.2(b)] (Section 1R05).

- Green. Inspectors identified a non-cited violation of 10 CFR 50.55a(b)(5), “In-Service Inspection Code Cases,” for the licensee’s failure to implement ASME Code Case N-513-2, “Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping, Section XI, Division 1.” Specifically, when a service water weld developed a leak, the licensee failed to characterize the flaw using a volumetric inspection method. The licensee corrected the condition by performing volumetric inspections of the flawed weld and then repaired the weld. The licensee entered this issue into their corrective action program as Condition Report CR-ANO-2-2013-01961.

Inspectors concluded that the licensee’s failure to characterize a service water weld flaw was a performance deficiency. The performance deficiency was more than minor because it was associated with the human performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Specifically, the licensee failed to ensure the reliability of the service water system wasn’t adversely affected by a significant weld flaw. Using Manual Chapter 0609, Attachment 4, “Initial Characterization of Findings,” and Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” Exhibit 2, the inspectors determined this finding was of very low safety significance (Green) because the degraded condition was not a design deficiency that affected system operability; did not represent an actual loss of function or a system; did not represent an actual loss of function of a single train or two separate trains for greater than its technical specification allowed outage time; did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety significant; and did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic event.

The finding was determined to have a cross-cutting aspect in the area of human performance, associated with resources, for the licensee’s failure to ensure adequate training of personnel. Specifically, personnel performing the flaw inspection were not adequately trained in the non-destructive testing requirements of the code case [H.2(b)](Section 1R15).

## PLANT STATUS

Unit 1 began the period at 82.5 percent power due to degraded flow from a heater drain pump. After repairs, operators raised power to approximately 100 percent power on October 7, 2013, and remained at full power for the rest of the inspection period.

Unit 2 began the inspection period at approximately 100 percent power. On December 9, 2013, the unit auxiliary transformer exploded. The debris caused an electrical fault on startup transformer 3. The reactor tripped and the licensee performed a natural circulation cooldown to cold shutdown using startup transformer 2 and emergency diesel generator B for electrical power. On December 22, 2013, main steam isolation valve A failed to close while the plant was in cold shutdown. The licensee remained in cold shutdown until the end of the inspection period for valve troubleshooting and repair.

## REPORT DETAILS

### 1. REACTOR SAFETY

#### **Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity, and Emergency Preparedness**

#### **1R01 Adverse Weather Protection (71111.01)**

##### .1 Readiness for Seasonal Extreme Weather Conditions

##### a. Inspection Scope

On October 24, 2013, the inspectors completed an inspection of the station's readiness for seasonal extreme weather conditions. The inspectors reviewed the licensee's adverse weather procedures for cold temperatures and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to the onset of cold weather, the licensee had corrected weather-related equipment deficiencies identified during the previous weather season.

The inspectors selected two risk-significant systems that were required to be protected from cold temperatures:

- Units 1 and 2, quality condensate storage tank
- Unit 1, intake structure

The inspectors reviewed the licensee's procedures and design information to ensure the systems and components would remain functional when challenged by cold weather. The inspectors verified that operator actions described in the licensee's procedures were adequate to maintain readiness of these systems. The inspectors walked down portions of these systems to verify the physical condition of the cold weather protection features.

These activities constituted one sample of readiness for seasonal adverse weather, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

.2 Readiness to Cope with External Flooding

a. Inspection Scope

On December 4, 2013, the inspectors completed an inspection of the station's readiness to cope with external flooding. After reviewing the licensee's flooding analysis, the inspectors chose two plant areas that were susceptible to flooding:

- Unit 1, intake structure
- Unit 2, intake structure

The inspectors reviewed plant design features and licensee procedures for coping with flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether credited operator actions could be successfully accomplished.

These activities constituted one sample of readiness to cope with external flooding, as defined in Inspection Procedure 71111.01.

b. Findings

No findings were identified.

**1R04 Equipment Alignment (71111.04)**

.1 Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walk-downs of the following risk-significant systems:

- October 15, 2013, Unit 1, emergency diesel generator B while emergency diesel generator A was inoperable for planned maintenance
- October 25, 2013, Unit 2, turbine driven emergency feedwater pump while emergency diesel generator A was inoperable for planned maintenance
- December 4, 2013, Unit 1, service water loop A while loop B was inoperable for planned maintenance



- December 19, 2013, Units 1 and 2, startup transformer 2 while startup transformers 1 and 3 were inoperable for emergent maintenance

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems were correctly aligned for the existing plant configuration.

These activities constituted four partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

.2 Complete Walkdown

a. Inspection Scope

On October 7, 2013, the inspectors performed a complete system walk-down inspection of Unit 1 high pressure injection pump B while high pressure injection pump C was inoperable for emergent maintenance. The inspectors reviewed the licensee's procedures and system design information to determine the correct system lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, in-process design changes, temporary modifications, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constituted one complete system walk-down sample, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

**1R05 Fire Protection (71111.05)**

.1 Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on five plant areas important to safety:

- October 11, 2013, Unit 1, Fire Zone 38-Y, emergency feedwater pump area

- October 22, 2013, Unit 2, Fire Zone 2014-LL, high pressure safety injection and low pressure safety injection pump room, train A
- October 24, 2013, Unit 2, Fire Zone 2150-C, old core protection calculator room
- December 9, 2013, Unit 2, Fire Zone FZ-2068, transformer area
- December 19, 2013, Unit 2, Fire Zone 2200-MM, turbine building

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted five quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

Introduction. Inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to hang the fluorescent light fixture above the Unit 1 motor driven emergency feedwater pump in a seismically qualified configuration.

Description. During a walkdown of the Unit 1 emergency feedwater pump room on October 11, 2013, inspectors identified that the fluorescent light above the motor driven emergency feedwater pump was not suspended in accordance with Drawing E-2060, "Seismic Supported Fluorescent Fixture to Concrete Ceiling," Revision 1, Sheet 47. Specifically, the fixture located directly above the motor driven emergency feedwater pump was suspended using open "S" hooks and a bent eye bolt. Drawing E-2060 specified that the "S" hooks be closed and the eye bolts be vertically installed with a closed eye. Inspectors were concerned that the open "S" hooks and the bent eye bolt may have resulted in the light and chain falling and impacting the pump below, during a seismic event. The licensee documented the inspectors' concern in Condition Report CR-ANO-1-2013-02830 and performed an operability determination on the pump. Inspectors reviewed the operability determination and agreed with the conclusion that the pump remained operable. The licensee corrected the configuration of the hanging light on November 12, 2013.

Inspectors reviewed the licensee's corrective actions from Condition Report CR-ANO-C-2013-00631, written in March 2013, which performed an extent of condition inspection of light fixtures in safety-related areas. The condition report included corrective action requirements to inspect and restore fluorescent light fixtures and "S" hooks to the correct seismic configuration, specified in Drawing E-2060, in all safety-related rooms or areas. The corrective action description contained a list of the rooms for Units 1 and 2 that needed to be inspected;

including the Unit 1 emergency feedwater pump room. Inspectors noted that the corrective actions were completed August 27, 2013, and that the light in the emergency feedwater pump room should have been corrected.

The licensee told inspectors that the light in the pump room had been overlooked due to the August light inspections being hurried. Due to the oversight, the licensee completed another inspection in safety-related areas and identified additional "S" hooks and light fixtures that needed to be adjusted to meet their seismically qualified design. The licensee did not identify any equipment that was made inoperable due to any inadequate light fixtures.

Analysis. Inspectors concluded that the licensee's failure to hang the fluorescent light fixture above the Unit 1 motor driven emergency feedwater pump in accordance with Drawing E-2060 was a performance deficiency. The performance deficiency was more than minor because it was associated with the design control attribute of the mitigating system cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Specifically, the licensee failed to ensure that, during a design basis seismic event, the light would not fall and adversely impact the safety-related pump below. Using Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, the inspectors determined that this finding was of very low safety significance (Green) because the finding was a deficiency affecting the design or qualification of mitigating equipment, in which the equipment maintained its operability; and did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic event.

The finding was determined to have a cross-cutting aspect in the area of human performance, associated with resources, for the licensee's failure to ensure that sufficient personnel were available for light inspections. Specifically, during the safety-related room inspections that were completed on August 27, 2013, the licensee failed to identify that the light above the motor driven emergency feedwater pump was not seismically attached, due to the hurried nature of the inspections [H.2(b)].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings." Drawing E-2060, "Seismic Supported Fluorescent Fixture to Concrete Ceiling," Revision 1, is a drawing used for hanging fluorescent lighting in a seismically qualified configuration, which is an activity affecting quality. Contrary to the above, prior to October 11, 2013, the licensee failed to hang the fluorescent light fixture above the Unit 1 motor driven emergency feedwater pump in accordance with Drawing E-2060. This was not an immediate safety concern because operability was adequately demonstrated when the misconfiguration was identified and because the licensee restored the light fixture to its seismically qualified configuration on November 12, 2013. Because the finding is of very low safety significance (Green) and the issue has been entered into the corrective action program as Condition Report CR-ANO-1-2013-02830, this violation is

being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000313/2013005-01, "Failure to Maintain Fluorescent Light Fixture Above Emergency Feedwater Pump in Seismically Qualified Configuration."

.2 Annual Inspection

a. Inspection Scope

On November 19, 2013, the inspectors completed their annual evaluation of the licensee's fire brigade performance. This evaluation included observation of an announced fire drill for the Unit 2 chemistry lab and surrounding offices.

During this drill, the inspectors evaluated the capability of the fire brigade members, the leadership ability of the brigade leader, the brigade's use of turnout gear and fire-fighting equipment, and the effectiveness of the fire brigade's team operation. The inspectors also reviewed whether the licensee's fire brigade met NRC requirements for training, dedicated size and membership, and equipment.

These activities constituted one annual inspection sample, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

**1R07 Heat Sink Performance (71111.07)**

a. Inspection Scope

On October 3, 2013, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors observed the licensee's inspection of the Unit 2 containment spray pump B seal cooler and the material condition of the heat exchanger internals. Additionally, the inspectors walked down the seal cooler to observe its performance and material condition and verified that the seal cooler was correctly categorized under the Maintenance Rule and was receiving the required maintenance.

These activities constitute completion of one heat sink performance annual review sample, as defined in Inspection Procedure 71111.07.

b. Findings

No findings were identified.

## **1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)**

### **.1 Review of Licensed Operator Requalification**

#### **a. Inspection Scope**

On November 6, 2013, the inspectors observed Units 1 and 2 simulator training for the operating crews. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed the performance of the simulator during the training activities.

These activities constitute completion of two quarterly licensed operator requalification program samples, as defined in Inspection Procedure 71111.11.

#### **b. Findings**

No findings were identified.

### **.2 Review of Licensed Operator Performance**

#### **a. Inspection Scope**

The inspectors observed the performance of on-shift licensed operators in the plant's main control room. The inspectors observed the operators' performance of the following activities:

- November 5, 2013, Unit 1, turbine-driven emergency feedwater surveillance
- November 15, 2013, Unit 2, main turbine valve stroke test
- November 20, 2013, Unit 2, containment spray A sump valve stroke test

In addition, the inspectors assessed the operators' adherence to plant procedures, including conduct of operations procedures and other operations department policies.

These activities constitute completion of three quarterly licensed operator performance samples, as defined in Inspection Procedure 71111.11.

#### **b. Findings**

No findings were identified.

.3 Annual Inspection (Units 1 and 2)

The licensed operator requalification program involves two training cycles that are conducted over a 2-year period. In the first cycle, the annual cycle, the operators are administered an operating test consisting of job performance measures and simulator scenarios. In the second part of the training cycle, the biennial cycle, operators are administered an operating test and a comprehensive written examination. For this annual inspection requirement, Arkansas Nuclear One, Unit 2, was in the first part of the training cycle while Arkansas Nuclear One, Unit 1, was in the second part of the training cycle.

a. Inspection Scope

The inspector reviewed the results of the examinations and operating tests for both units to satisfy the annual inspection requirements.

On September 4, 2013, the licensee informed the lead inspector of the following Unit 2 results:

- 12 of 12 crews passed the simulator portion of the operating test
- 58 of 58 licensed operators passed the simulator portion of the operating test
- 58 of 58 licensed operators passed the job performance measure portion of the examination

Because there were no overall failures in any of these areas, there were no required remediations performed for the Unit 2 operating tests.

On September 4, 2013, the licensee informed the lead inspector of the following Unit 1 results:

- 11 of 12 crews passed the simulator portion of the operating test
- 55 of 56 licensed operators passed the simulator portion of the operating test
- 56 of 56 licensed operators passed the job performance measure portion of the examination
- 56 of 58 licensed operators passed the written examination

The individuals that failed the simulator scenario portions of the operating test were remediated, retested, and passed their retake operating tests prior to returning to shift. The two individuals that failed the written examinations were remediated, retested, and passed their retake written examinations prior to returning to shift.

The inspector completed one inspection sample of the annual licensed operator requalification program.

b. Findings

No findings were identified.

**1R12 Maintenance Effectiveness (71111.12)**

a. Inspection Scope

The inspectors reviewed four instances of degraded performance or condition of safety-related structures, systems, and components (SSCs):

- December 3, 2013, Unit 1, instrument air compressor A tripped
- December 5, 2013, Unit 1, A3 and A4 breaker failures
- December 20, 2013, Unit 1, plant performance criteria
- December 20, 2013, Units 1 and 2, alternate ac diesel generator unavailability

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of four maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

**1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)**

a. Inspection Scope

On December 17, 2013, the inspectors observed portions of emergent work activities in the switchyard that included de-energizing startup transformers 1 and 3, which had the potential to cause an initiating event, to affect the functional capability of mitigating systems, and to impact barrier integrity.

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities, including a review of the risk assessment. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected SSCs.

These activities constitute completion of one maintenance risk assessments and emergent work control inspection sample, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

**1R15 Operability Determinations and Functionality Assessments (71111.15)**

a. Inspection Scope

The inspectors reviewed two operability determinations that the licensee performed for degraded or nonconforming SSCs:

- October 21, 2013, Unit 2, operability determination of service water B valve weld flaw
- December 11, 2013, Unit 1, operability determination of startup transformer 1 following startup transformer 3 electrical fault

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded SSC to be operable, the inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability of the degraded SSC.

These activities constitute completion of two operability and functionality review samples, as defined in Inspection Procedure 71111.15.

b. Findings

Introduction. Inspectors identified a Green non-cited violation of 10 CFR 50.55a(b)(5), "In-Service Inspection Code Cases," for the licensee's failure to implement ASME Code Case N-513-2, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping, Section XI, Division 1." Specifically, when a service water weld developed a leak, the licensee failed to characterize the flaw using a volumetric inspection method.

Description. Inspectors reviewed Condition Report CR-ANO-2-2013-01913, initiated on October 11, 2013, for water leaking out of a weld on the Unit 2 service water loop B supply to emergency control room chiller B. The leakage was indicative of a flaw in the weld. The licensee chose to apply ASME Code Case N-513-2 to temporarily allow continued operation with the flaw. The code case required volumetric inspections to characterize the flaw geometry so that it could be evaluated.

The licensee performed ultrasonic thickness measurements of the weld area, but had not been able to detect any thickness loss or flaw. However, the inspectors noted that



the leak was through a linear crack, which should be able to be detected. The licensee's operability evaluation assumed that the flaw was a pit, contrary to the evidence of the linear surface crack, and without subsurface flaw geometry.

The inspectors determined through interviews that the ultrasonic thickness measurements were taken on the metal adjacent to the flawed weld, with no measurements through the weld. Therefore, the licensee's method of volumetric inspection would not be able to characterize a flaw in the weld material or in the boundary between the pipe and the weld.

The licensee performed the ultrasonic thickness measurements through the flawed weld on October 23, 2013, after inspectors questioned the operability evaluation. The licensee characterized the flaw and detected more degradation than was visible on the weld surface. The licensee determined that the weld was still able to perform its structural function, so there was no actual loss of system function.

The inspectors determined, through interviews, that licensee personnel had an inadequate understanding of the code case requirement to perform volumetric inspection through the plane of the flaw. As a result, in some cases, the licensee was performing inspections as close to the plane of the flaw as they could without preparing the surface to obtain the results required by the code case.

Analysis. Inspectors concluded that the licensee's failure to characterize a service water weld flaw was a performance deficiency. The performance deficiency was more than minor because it was associated with the human performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences, and is therefore a finding. Specifically, the licensee failed to ensure the reliability of the service water system wasn't adversely affected by a significant weld flaw. Using Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2, the inspectors determined this finding was of very low safety significance (Green) because the degraded condition was not a design deficiency that affected system operability; did not represent an actual loss of function or a system; did not represent an actual loss of function of a single train or two separate trains for greater than its technical specification allowed outage time; did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety significant; and did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic event.

The finding was determined to have a cross-cutting aspect in the area of human performance, associated with resources, for the licensee's failure to ensure adequate training of personnel. Specifically, personnel performing the flaw inspection inadequately understood the code case requirements [H.2(b)].

Enforcement. Title 10 CFR 50.55a(b)(5), states, in part, that licensees may apply ASME Boiler and Pressure Vessel Code cases listed in Regulatory Guide 1.147, "Inservice

Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 16. Regulatory Guide 1.147 listed, in part, ASME Code Case N-513-2. ASME Code Case N-513-2, states, in part, that the flaw geometry shall be characterized by volumetric inspection methods and the full pipe circumference at the flaw location shall be inspected to characterize the length and depth of all flaws in the pipe section. Contrary to the above, from October 11, 2013, to October 23, 2013, the licensee implemented Code Case N-513-2 without characterizing the flaw by volumetric inspection methods and without inspecting the full pipe circumference to characterize the length and depth of all flaws in the pipe section. Specifically, the licensee performed volumetric inspections of the pipe adjacent to the weld, which did not characterize the weld flaw. The licensee corrected the condition by performing volumetric inspections of the flawed weld and then repaired the weld. Because this finding is of very low safety significance (Green) and has been entered into the corrective action program as Condition Report CR-ANO-2-2013-01961, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000368/2013005-02, "Inadequate Operability Evaluation Due to Failure to Characterize Weld Flaw."

#### **1R18 Plant Modifications (71111.18)**

##### a. Inspection Scope

On December 20, 2013, the inspectors reviewed a temporary modification to provide power from startup transformer 3 to Unit 2 during full power operation until the next refueling outage.

The inspectors verified that the licensee had installed this temporary modification in accordance with technically adequate design documents. The inspectors verified that this modification did not adversely impact the operability or availability of affected SSCs. The inspectors reviewed design documentation and plant procedures affected by the modification to verify the licensee maintained configuration control.

These activities constitute completion of one sample of temporary modifications, as defined in Inspection Procedure 71111.18.

##### b. Findings

No findings were identified.

#### **1R19 Post-Maintenance Testing (71111.19)**

##### a. Inspection Scope

The inspectors reviewed three post-maintenance testing activities that affected risk-significant SSCs:

- October 17, 2013, Unit 1, emergency diesel generator A governor oil replacement and venting

- October 17, 2013, Unit 1, emergency diesel generator A governor local speed indicator replacement
- October 17, 2013, Unit 1, emergency diesel generator A 24-month maintenance overhaul

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constitute completion of three post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

**1R20 Refueling and Other Outage Activities (71111.20)**

a. Inspection Scope

During the Unit 2 outage that continued through the end of the inspection period, the inspectors evaluated the licensee's outage activities. The inspectors verified that the licensee considered risk in developing and implementing the outage plan, appropriately managed personnel fatigue, and developed mitigation strategies for losses of key safety functions. This verification included the following:

- Review of the licensee's outage plan
- Monitoring of shut-down and cool-down activities
- Verification that the licensee maintained defense-in-depth during outage activities

These activities constitute completion of one outage activities sample, as defined in Inspection Procedure 71111.20.

b. Findings

No findings were identified.

**1R22 Surveillance Testing (71111.22)**

a. Inspection Scope

The inspectors observed seven risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the SSCs were capable of performing their safety functions:

In-service tests:

- November 5, 2013, Unit 1, turbine driven emergency feedwater pump
- November 20, 2013, Unit 2, containment spray A sump valve stroke test

Other surveillance tests:

- October 29, 2013, Unit 2, low pressure safety injection pump B test
- November 4, 2013, Unit 1, borated water storage tank chemistry sample
- November 13, 2013, Unit 2, wide range containment pressure A calibration
- November 15, 2013, Unit 2, main turbine control valves, stop valves, and stop/intercept valves stroke test
- December 19, 2013, Unit 2, startup transformer 3 differential relay functional test

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the test satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constitute completion of seven surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

**Cornerstone: Emergency Preparedness**

1EP4 Emergency Action Level and Emergency Plan Changes (IP 71114.04)

a. Inspection Scope

The NSIR headquarters staff performed an in-office review of the latest revisions of various Emergency Plan Implementing Procedures and the Emergency Plan located under ADAMS accession number ML13262A430 as listed in the Attachment.

The licensee determined that in accordance with 10 CFR 50.54(q), the changes made in the revisions resulted in no reduction in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The NRC review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, this revision is

subject to future inspection. The specific documents reviewed during this inspection are listed in the Attachment.

These activities constitute completion of one sample as defined in Inspection Procedure 71114.04-05.

b. Findings

No findings were identified.

**1EP6 Drill Evaluation (71114.06)**

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors observed an emergency preparedness drill on October 9, 2013, to verify the adequacy and capability of the licensee's assessment of drill performance. The inspectors reviewed the drill scenario, observed the drill from the Unit 1 simulator, technical support center, operations support center, and emergency operations facility, and attended the post-drill critique. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the licensee in the post-drill critique and entered into the corrective action program for resolution.

These activities constitute completion of one emergency preparedness drill observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

.2 Training Evolution Observation

a. Inspection Scope

On November 4, 2013, the inspectors observed a Unit 2 simulator-based licensed operator requalification training that included implementation of the licensee's emergency plan. The inspectors verified that the licensee's protective action recommendations were appropriate. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the evaluators and entered into the corrective action program for resolution.

These activities constitute completion of one training observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational and Public Radiation Safety**

**2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)**

a. Inspection Scope

The inspectors assessed the licensee's performance in assessing the radiological hazards in the workplace associated with licensed activities. The inspectors assessed the licensee's implementation of appropriate radiation monitoring and exposure control measures for both individual and collective exposures. During the inspection, the inspectors interviewed licensee personnel and reviewed licensee performance in the following areas:

- The hazard assessment program, including a review of the licensee's evaluations of changes in plant operations and radiological surveys to detect dose rates, airborne radioactivity, and surface contamination levels
- Instructions and notices to workers, including labeling or marking containers of radioactive material, radiation work permits, actions for electronic dosimeter alarms, and changes to radiological conditions
- Programs and processes for control of sealed sources and release of potentially contaminated material from the radiologically controlled area, including survey performance, instrument sensitivity, release criteria, procedural guidance, and sealed source accountability
- Audits, self-assessments, and corrective action documents related to radiological hazard assessment and exposure controls since the last inspection

These activities constitute completion of one sample of radiological hazard assessment and exposure controls as defined in Inspection Procedure 71124.01.

b. Findings

No findings were identified.

## 2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

### a. Inspection Scope

The inspectors verified that the licensee controlled in-plant airborne radioactivity concentrations consistent with ALARA principles and that the use of respiratory protection devices did not pose an undue risk to the wearer. During the inspection, the inspectors interviewed licensee personnel and reviewed licensee performance in the following areas:

- The licensee's use, when applicable, of ventilation systems as part of its engineering controls
- The licensee's respiratory protection program for use, maintenance, and quality assurance of NIOSH certified equipment, and qualification and training of personnel
- The licensee's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions, status of SCBA staged and ready for use in the plant and associated surveillance records, and personnel qualification and training
- Audits, self-assessments, and corrective action documents related to in-plant airborne radioactivity control and mitigation since the last inspection

These activities constitute completion of one sample of in-plant airborne radioactivity control and mitigation as defined in Inspection Procedure 71124.03.

### b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security**

### 4OA1 Performance Indicator Verification (71151)

#### .1 Mitigating Systems Performance Index: Residual Heat Removal Systems (MS09)

##### a. Inspection Scope

The inspectors reviewed the licensee's mitigating system performance index data for the period of October 1, 2012, through September 30, 2013, to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment

Performance Indicator Guideline,” Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for residual heat removal systems for Units 1 and 2, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index: Cooling Water Support Systems (MS10)

a. Inspection Scope

The inspectors reviewed the licensee’s mitigating system performance index data for the period of October 1, 2012, through September 30, 2013, to verify the accuracy and completeness of the reported data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the mitigating system performance index for cooling water support systems for Units 1 and 2, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

**Cornerstone: Occupational Radiation Safety**

.3 Occupational Exposure Control Effectiveness (OR01)

a. Inspection Scope

The inspectors verified that there were no unplanned exposures and/or losses of radiological control over locked high radiation areas and very high radiation areas during the period of July 1, 2012, to September 30, 2013. The inspectors reviewed a sample of radiologically controlled area exit transactions showing exposures greater than 100 mrem and reviewed corrective action program records. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, “Regulatory Assessment Performance Indicator Guideline,” Revision 6, to determine the accuracy of the reported data.

These activities constituted verification of the occupational exposure control effectiveness performance indicator as defined in Inspection Procedure 71151.



b. Findings

No findings were identified.

.4 Radiological Effluent Technical Specifications (RETS)/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences (PR01)

a. Inspection Scope

The inspectors reviewed corrective action program records for liquid or gaseous effluent releases that occurred during the period July 1, 2012, to September 30, 2013, to verify the performance indicator data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to determine the accuracy of the reported data.

These activities constituted verification of the radiological effluent technical specifications (RETS)/offsite dose calculation manual (ODCM) radiological effluent occurrences performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

**40A2 Problem Identification and Resolution (71152)**

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Semiannual Trend Review

a. Inspection Scope

The inspectors reviewed the licensee's corrective action program, performance indicators, system health reports, and other documentation to identify trends that might indicate the existence of a more significant safety issue. The inspectors verified that the licensee was taking corrective actions to address identified adverse trends.

These activities constitute completion of one semiannual trend review sample, as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

.3 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors selected one issue for an in-depth follow-up:

- On October 18, 2013, inspectors reviewed operator workarounds for Units 1 and 2.

The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the conditions.

- On December 9, 2013, the Unit 2 auxiliary transformer exploded.

The inspectors assessed the licensee's problem identification threshold, interim cause analyses, extent of condition reviews and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct the condition.

These activities constitute completion of two annual follow-up samples, which included one operator work-around sample, as defined in Inspection Procedure 71152.

b. Findings

No findings were identified.

#### **40A3 Follow-up of Events and Notices of Enforcement Discretion (71153)**

##### **a. Inspection Scope**

On December 9, 2013, the Unit 2 auxiliary transformer exploded. The debris caused an electrical fault on startup transformer 3. The Unit 2 reactor tripped due to the loss of power for the reactor coolant pumps. The licensee declared a Notification of Unusual Event due to the transformer fire and explosion. Operators performed a natural circulation cooldown to cold shutdown with startup transformer 2 and emergency diesel generator B providing power for emergency equipment.

Unit 1 lost power from startup transformer 1 when the autotransformer locked out due to the Unit 2 electrical fault. The reactor did not trip because the unit auxiliary transformer was still available. There were no other significant impacts on Unit 1.

Inspectors observed implementation of emergency and abnormal operating procedures, verified emergency action levels, verified the status of safety equipment and barriers, assessed radiological impacts, and observed command and control functions.

These activities constitute completion of one event follow-up sample, as defined in Inspection Procedure 71153.

##### **b. Findings**

No findings were identified.

#### **40A6 Meetings, Including Exit**

##### **Exit Meeting Summary**

The inspector obtained the final annual examination results and telephonically exited with Mr. R. Martin, Operations Training Superintendent, on September 5, 2013. The inspector did not review any proprietary information during this inspection.

On December 12, 2013, the inspectors presented the radiation safety inspection results to Ms. S. Pyle, Manager, Regulatory Assurance, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On January 16, 2014, the inspectors presented the inspection results to Mr. J. Browning, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

- J. Browning, Site Vice President
- P. Butler, Supervisor, Systems Engineering
- M. Chisum, Vice President/General Manager, Plant Operations
- G. Damron, Instrumentation Technician, Radiation Protection
- B. Eichenberger, Manager, Corrective Action and Assurance
- R. Fuller, Manager, Nuclear Oversight
- C. Garbe, Supervisor, Reactor Engineering
- B. Greeson, Procurement Manager, Engineering
- M. Hall, Licensing Specialist
- D. Hughes, Engineering Supervisor
- D. James, Director, Regulatory and Performance Department
- B. Lynch, Superintendent, Radiation Protection
- R. Martin, Superintendent, Operations Training
- D. Marvel, Manager, Radiation Protection
- M. McCullah, Radiation Protection Specialist
- N. Mosher, Licensing Specialist
- K. Panther, Nondestructive Examination Lead
- S. Pyle, Manager, Regulatory Assurance
- A. Remer, Project Manager
- P. Schlutermor, Boric Acid Lead
- C. Simpson, Superintendent, U2 Operations Training

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened and Closed

05000313/2013005-01	NCV	Failure to Maintain Fluorescent Light Fixture Above Emergency Feedwater Pump in Seismically Qualified Configuration (Section 1R05)
05000368/2013005-02	NCV	Inadequate Operability Evaluation Due to Failure to Characterize Weld Flaw (Section 1R15)

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

#### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OP-1104.039	Plant Heating and Cold Weather Operations	25
OP-2106.032	Unit Two Freeze Protection Guide	23
OP-1203.025	Natural Emergencies	45
OP-2203.008	Natural Emergencies	27

#### Condition Report (CR)

CR-ANO-1-2013-02915

### **Section 1R04: Equipment Alignment**

#### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OP-1104.002	Makeup & Purification System Operation	79
OP-1104.036	Emergency Diesel Generator Operation	66
OP-1104.029	Service Water and Auxiliary Cooling System	104

#### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-231	Piping & Instrument Diagram Makeup & Purification System	113

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-238	Piping and Instrumentation Diagram Control Rod Drives & Misc. Reactor Coolant Pump Conns. – Sheet 1	78
M-209	Piping and Instrumentation Diagram Circ. Water, Service Water & Fire Water Intake Structure Equipment – Sheet 1	114
M-2204, Sh. 4	Piping and Instrumentation Diagram, Emergency Feedwater	67
M-2206, Sh. 1	Piping and Instrumentation Diagram, Steam Generator Secondary System	151
M-210	Piping and Instrumentation Diagram Service Water – Sheet 1	150

### Condition Reports (CRs)

CR-ANO-1-2013-02798                      CR-ANO-1-2013-02800                      CR-ANO-1-2008-01657

### **Section 1R05: Fire Protection**

#### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
1B-335-38-Y	Unit 1 Prefire Plan for Emergency Feedwater Pump Area	2
	Fire Hazards Analysis	15
2b-317-2014-LL	Unit 2 Prefire Plan for “A” HPSI & LPSI Pump Room	3
2A-386-2243-NN	Unit 2 Chemistry Lab & Offices	2
2B-ADD- U2MainTrans	Unit 2 Prefire Plan for Transformer Area	0
2A-404-2150-C	Unit 2 Prefire Plan for Core Protection Calculator Room	1

#### Calculation

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CALC-85-E- 0053-55	Fire Area B-6 Combustible Loading Evaluation	1

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
FZ-2016	Fire Zone Detail Pump Area	2
FP-2106	Fire Zone Plat at Elev. 317'-0"	16
FZ-2048	Fire Zone Detail H & Mech. Equipment Room, and Chemistry Lab	2
FZ-2007	Fire Zone Detail Panel Room and Corridor	2

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
ASOTH-FP-FBDRLS	Attachement 4 - Fire Bridgade Drill Evaluator Worksheet – Unit 2 Chemistry Lab and Office	November 19, 2013

**Section 1R07: Heat Sink Performance**

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2HCC-236-1, Sh. 1	Supply Header #2 to Containment Spray Pump Seal Cooler 2E-47B	5
M-2236, Sh. 1	Containment Spray System	95
M-2210, Sh. 2	Service Water System	81

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
TD W180.0050	Instructions for Installing and Operating Seal Injection Water Coolers	2
STM 2-08	Containment Spray System	20
DCP-81-2089	Install Nuclear Service Strainer	2

Work Order

WO52397180

**Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance**

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
A1SPGLOR1402 03	Unannounced Casualties RCPs	1
A2SPGLOR1402 03	Static Simulator	0
2106.009	Turbine Generator Operations	71
2104.005	Containment Spray Conduct of Operations	69
EN-FAP-OP-006	Operator Aggregate Impact Index Performance Indicator	0
EN-OP-104	Operability Determination Process	7

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Operating Test Results	September 5, 2013

Condition Report (CR)

CR-ANO-2-2013-02000

**Section 1R12: Maintenance Effectiveness**

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	Maintenance Rule Database	

Condition Reports (CRs)

CR-ANO-1-2013-02551	CR-ANO-1-2013-01678	CR-ANO-1-2013-01875
CR-ANO-1-2013-00554	CR-ANO-2-2013-01820	CR-ANO-C-2013-00893
CR-ANO-1-2013-02961	CR-ANO-1-2013-01214	



**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Procedures

<u>Number</u>	<u>Title</u>	<u>Date</u>
COPD-024	Risk Assessment Guidelines – SU1 Transformer Outage	December 17, 2013
COPD-024	Risk Assessment Guidelines – Remove/Install Unit Aux Transformer	December 14, 2013

Work Orders (WOs)

369570-1	275742-01
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**Section 1R15: Operability Determinations and Functionality Assessments**

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OP-1032.036	Service Water Piping Leak Evaluation and Monitoring	3

Condition Reports (CRs)

CR-ANO-1-2013-02830	CR-ANO-1-2012-01853	CR-ANO-2-2013-01913
CR-ANO-2-2013-01978	CR-ANO-2-2010-00658	

**Section 1R18: Plant Modifications**

Procedure

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-LI-100	Process Applicability Determination	13

Miscellaneous

<u>Number</u>	<u>Title</u>
	Load Flow Analyses for Full Power Operation on SU-3 (2F13-2 Failure of Unit 2 Aux. Transformer)
	Assessment of Grid Disturbances (2F13-2 Failure of Unit 2 Aux. Transformer)
	Temporary Modification of EC # 48200 22 kV Cable Ampacity Assessment

Condition Report (CR)

CR-ANO-C-2013-03170

**Section 1R19: Post-Maintenance Testing**

Procedure

<u>Number</u>	<u>Title</u>	<u>Revision</u>
1104.036	Emergency Diesel Generator Operation	66

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
TD M494.0030	Jones Instrument Corporation Mechanical Tachometers and Speedometers	0

Work Orders (WOs)

00347753	52382922	00361516
00347291		

Condition Reports (CRs)

CR-ANO-1-2013-00882	CR-ANO-1-2013-02874	CR-ANO-1-2013-02870
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**Section 1R20: Refueling and Other Outage Activities**

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
STM 2-32-1	Switchyard Components and Operation	15
STM 1-32	Electrical Distribution	34
STM 2-31	Emergency Diesel Generators	26
2104.036	Emergency Diesel Generator Operations	86
OP-1015.037-ATT-B	Post Transient Review	10
OP-2202.009	Functional Recovery	17
OP-2202.011	Lower Mode Functional Recovery	11

Calculation

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CALC-ANO2-NE-12-00002	Unit 2 Cycle 23 Core Operating Limits Report	1

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	Sequence of Events Summary Unit Aux Transformer Fire and Plant Trip	

**Section 1R22: Surveillance Testing**

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
1607.012	Sampling the Borated Water Storage Tank (BWST)	005-05-0
1042.003	Radoichemisry Routine Surveillance Schedule and Technical Specification Reporting	31
2104.040	LPSI System Operations	62
OP-2304.209	Unit 2 Wide Range Containment Pressure Red Channel	8
2104.005	Unit 2 Containment Spray	69
2106.009	Turbine Generator Operations – Supplement 3	71
OP-1106.006	Emergency Feedwater Pump Operation	89

Work Orders (WOs)

52451567	52455652	370097
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Condition Reports (CRs)

CR-ANO-2-2013-02005	CR-ANO-2-2011-01914	CR-ANO-2-2011-01925
CR-ANO-2-2013-02000		

## Section 1EP6: Drill Evaluation

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision Date</u>
	Arkansas Nuclear One Emergency Plan	37
1903.011	Emergency Response/Notifications	46
SM-PAR-5	Shift Manager PI Drill Evaluation Session	November 4, 2013
1903.011-Y	Emergency Class Initial Notification Message	42

## Section 2RS1: Radiological Hazard Assessment and Exposure Controls

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-RP-100	Radiation Worker Expectations	7
EN-RP-101	Access Control for Radiologically Controlled Areas	7
EN-RP-102	Radiological Control	3
EN-RP-108	Radiation Protection Posting	12
EN-RP-143	Source Control	9

### Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-ALO-2013-00022	Self-Assessment: Radiation Safety – Occupational And Public	February 26, 2013

### Condition Reports (CRs)

CR-ANO-2-2012-02397	CR-ANO-2-2012-02791	CR-ANO-C-2012-03037
CR-ANO-C-2012-03068	CR-ANO-1-2013-00780	CR-ANO-C-2013-00810
CR-ANO-C-2013-01354	CR-ANO-C-2013-01600	CR-ANO-C-2013-02400

### Radiation Work Permits

<u>Number</u>	<u>Title</u>
2013-1412	Locked High Radiation Activities
2013-1430	Disassemble and Reassemble the Reactor Vessel Head
2013-1442	Steam Generator Primary Side Inspections
2013-1471	Alloy 600 Mitigation
2013-1502	Fibrous Insulation Mitigation

### Radiation Survey Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
1003-901	Unit 1 Reactor Building 335' General Area	March 27, 2010
1110-1168	Letdown Heat Exchange Room, Unit 1 Reactor Building	October 27, 2011
1211-0076	Unit 1 Auxiliary Building 335' Boronometer Room	November 13, 2012
1109-0162	Unit 1 Auxiliary Building 335' T15A/T15B/T15C Room	September 20, 2011
1110-1088	Unit 1 Auxiliary Building 335' Seal Injection Filter Room	October 26, 2011
1303-0562	Unit 1 Auxiliary Building 335' F3 A/B Filter Rooms	March 22, 2013
1111-0763	Unit 1 Reactor Building 404' Top of the Head	November 15, 2011
1111-0709	Unit 1 Reactor Building 401' Refueling Canal	November 14, 2011
1110-0744	Unit 1 Reactor Building 404' General Area	October 21, 2011
1110-0745	Unit 1 "A" Steam Generator Platform	October 21, 2011
1110-0424	Unit 1 Reactor Building 405' South Cavity	October 18, 2011
1110-469	Unit 1 Reactor Building 405' North Cavity	October 18, 2011

### Air Sampling Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
AS-2013-00382	"B" Steam Generator Lower Manway	March 27, 2013
AS-2013-00384	Lower "B" Steam Generator Manway Platform	March 27, 2013
AS-2013-00386	"A" Steam Generator Lower	March 27, 2013
AS-2013-00392	"B" Steam Generator	March 27, 2013

### Air Sampling Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
AS-2013-00394	"A" Steam Generator	March 27, 2013
AS-2013-00399	"A" Steam Generator	March, 28, 2013
AS-2013-00428	"B" Upper Manway Platform Steam Generator	March 28, 2013

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	1R24 ALARA Report	
	Radioactive Source List	
	Source Issue/Return Log	December 11, 2013
WO 52322791	EN-RP-143 Annual Inventory Non Installed Radioactive Source	April 10, 2012
WO 52399834	EN-RP-143 Annual Inventory Non Installed Radioactive Source	February 23, 2013
WO 52439896	EN-RP-143 Semi Annual Leak Test of Sealed Sources	August 14, 2013

### **Section 2RS3: In-plant Airborne Radioactivity Control and Mitigation**

#### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
1903.060	Emergency Supplies and Equipment	42
5120.412	In-Place Testing of the Emergency Operations Facility Filtration System	5
5120.415	In-Place Testing of the Unit 1 Control Room Filtration System	11
5120.425	In-Place Testing of the Unit 2 Control Room Filtration System	12
EN-RP-122	Alpha Monitoring	7

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-RP-131	Air Sampling	10
EN-RP-310	Operation and Initial Setup of the Eberline AMS-4 Continuous Air Monitor	4
EN-RP-402	DOP Challenge Testing of HEPA Vacuums and Portable Ventilation Units	4
EN-RP-404	Operation and Maintenance of HEPA Vacuum Cleaners and HEPA Ventilation Units	6
EN-RP-501	Respiratory Protection Program	4
EN-RP-502	Inspection And Maintenance Of Respiratory Protection Equipment	8
EN-RP-503	Selection, Issue, and Use of Respiratory Protection Equipment	5
EN-RP-504	Breathing Air	3
HES-06	Ventilation/Filtration Testing Program	8

### Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-ALO-2010-0027	ANO Control Room Habitability (CRH) Self-Assessment	September 28, 2010
LO-ALO-2013-00022	Self-Assessment: Radiation Safety – Occupational And Public	February 26, 2013

### Condition Reports (CRs)

CR-ANO-1-2011-01873	CR-ANO-1-2011-02327	CR-ANO-1-2011-02510
CR-ANO-1-2011-02873	CR-ANO-1-2013-01422	CR-ANO-2-2011-01401
CR-ANO-2-2011-02684	CR-ANO-C-2011-01238	CR-ANO-C-2011-02832
CR-ANO-C-2011-02944	CR-ANO-C-2013-01161	CR-ANO-C-2013-01162
CR-ANO-C-2013-01198	LO-WTANO-2012-00245	

### Radiation Work Permits

<u>Number</u>	<u>Title</u>
20131407	Decontamination Activities – Unit 1
20131417	Install and Remove Insta-Cote Material
20131432	Fuel Movement Activities
20131471	Alloy 600 Mitigation 1R24
20122407	Decontamination Activities – Unit 2
20122416	Install and Remove Insta-Cote Material

### Ventilation/Filtration Testing Records

<u>Number</u>	<u>Title</u>	<u>Date</u>
WO 52222079	Perform Test of EOF Filtration System	April 20, 2011
WO 52296306	2VSF-9 Charcoal Sample and Flow 18M Test (Red Train)	February 9, 2012
WO 52319201	18M VSF-9 (CR Emerg Air Recirc) & Piggyback Green Train	March 20, 2012
WO 52348912	Perform Test of EOF Filtration System	August 7, 2012
WO 52386770	18M VSF-9 (CR Emerg Air Recirc) & Piggyback Green Train	August 22, 2013
WO 52398383	2VSF-9 Charcoal Sample and Flow 18M Test (Red Train)	July 2, 2013

### Breathing Air System Air Quality Testing Records

<u>System</u>	<u>Title</u>	<u>Date</u>
2C-27-B	U2 Instrument Air Compressor - Grade D/L	August 2, 2013
2C-27-B	U2 Instrument Air Compressor - Grade D/L	July 23, 2013
C-28-B	U1 Instrument Air Compressor - Grade D/L	July 21, 2013
C-82-A	Eagle Air Compressor - Grade D/L	July 2, 2013
C-82-C	Bauer Air Compressor - Grade D/L	July 1, 2013



Breathing Air System Air Quality Testing Records

<u>System</u>	<u>Title</u>	<u>Date</u>
	Blast Yard Compressor - Grade D	July 1, 2013
	Temporary Instrument Air Compressor - Grade D	July 11, 2013

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Annual Respiratory Protection Equipment Inventory & Inspection	November 27, 2013
	C.A.R.E Authorized Repair Center Certificate	June 5, 2013
	DOP Test Data Sheet	January 21, 2013
	DOP Test Data Sheet	March 13, 2013
	DOP Test Data Sheet	May 10, 2013
	DOP Test Data Sheet	May 31, 2013
	DOP Test Data Sheet	October 14, 2013
	Face Piece Inspection Log	February 26, 2013
	Face Piece Inspection Log	November 19, 2013
	SCBA Inspection Log	March 1, 2013
	SCBA Inspection Log	November 25, 2013
ANO-2013-005	TEDE-ALARA Evaluation for RWP 20131407 Task 5	January 23, 2013

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
ANO-2013-009	TEDE-ALARA Evaluation for RWP 20131417 Tasks 1/2/3	December 15, 2011
ANO-2013-018	TEDE-ALARA Evaluation for RWP 20131432 Task 2	August 23, 2012
ANO-2013-023	TEDE-ALARA Evaluation for RWP 20131442 Tasks 3/4/5	December 28, 2010
ANO-2013-036	TEDE-ALARA Evaluation for RWP 20131471 Tasks All	December 21, 2011
CNRI-2006-00010	ANO Unit 2 - Request for the Use of Delta Protection's Self Fed Single Use "Mururoa BLU" Suit Systems	July 26, 2006
CNRI-2006-00011	ANO Unit 2 - Request for Use of Delta Protection Mururoa V4F1 R Supplied Air Suits	August 14, 2006
CNRI-2006-00013	ANO Unit 1 - Request for the Use of Delta Protection's Self Fed Single Use "Mururoa BLU" Suit Systems	October 2, 2006
CNRI-2006-00014	ANO Unit 1 - Request for Use of Delta Protection Mururoa V4F1 R Supplied Air Suits	October 2, 2006

### **Section 40A1: Performance Indicator Verification**

#### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ECH-NE-09- 00041	ANO1 Mitigation System Performance Index Basis Document	0
ANO2-SA-06- 00001	ANO-2 MSPI Basis Document Support Analysis	1

Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
EN-LI-114, Attachment 9.3	Verification of ROP Data Input to CDE	3 <sup>rd</sup> Quarter 2012
EN-LI-114, Attachment 9.3	Verification of ROP Data Input to CDE	4 <sup>th</sup> Quarter 2012
EN-LI-114, Attachment 9.3	Verification of ROP Data Input to CDE	1 <sup>st</sup> Quarter 2013
EN-LI-114, Attachment 9.3	Verification of ROP Data Input to CDE	2 <sup>nd</sup> Quarter 2013
	ANO -1 - MSPI Derivation Report - Residual Heat Removal System (UAI)	October 17, 2013
	ANO -2 - MSPI Derivation Report - Residual Heat Removal System (UAI)	October 17, 2013
	ANO -1 - MSPI Derivation Report - Residual Heat Removal System (URI)	October 17, 2013
	ANO -2 - MSPI Derivation Report - Residual Heat Removal System (URI)	October 17, 2013
	ANO -1 - MSPI Derivation Report – Cooling Water System (UAI)	October 17, 2013
	ANO -2 - MSPI Derivation Report – Cooling Water System (UAI)	October 17, 2013
	ANO -1 - MSPI Derivation Report – Cooling Water System (URI)	October 17, 2013
	ANO -2 - MSPI Derivation Report – Cooling Water System (URI)	October 17, 2013

Condition Reports (CRs)

CR-ANO-1-2013-00545	CR-ANO-1-2013-02671	CR-ANO-2-2012-03336
CR-ANO-1-2012-01599	CR-ANO-1-2013-00701	CR-ANO-1-2013-00825
CR-ANO-C-2013-00888		

## Section 40A2: Problem Identification and Resolution

### Procedure

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2202.010	Standard Attachments	21

### Condition Reports (CRs)

CR-ANO-2-2013-02004	CR-ANO-2-2011-01648
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## Section 40A3: Follow-up of Events and Notices of Enforcement Discretion

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OP-2203.013	Natural Circulation Operations	14
OP-2104.004	Shutdown Cooling System	55

### Miscellaneous

<u>Number</u>	<u>Title</u>	<u>Date</u>
	North American Substation Services Electrical Testing and Doble SFRA for Startup Transformer 3	December 13, 2013
	Tan-Delta Testing of 22 kV Cables for Startup Transformer 3	December 12, 2013

### Condition Reports (CRs)

CR-ANO-2-2013-02405	CR-ANO-2-2013-02393
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### Work Orders

00369706-01	00369706-02	00370097
00369583-01		

**PAPERWORK REDUCTION ACT STATEMENT**

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

**The following items are requested for the  
Occupational Radiation Safety Inspection  
at Arkansas Nuclear One  
December 9-12, 2013  
Integrated Report 2013005**

If you have any questions or comments, please contact Larry Ricketson at (817) 200-1165/[Larry.Ricketson@nrc.gov](mailto:Larry.Ricketson@nrc.gov) or John O'Donnell at (817) 200-1441/[John.Odonnell@nrc.gov](mailto:John.Odonnell@nrc.gov).

**1. Radiological Hazard Assessment and Exposure Controls (71124.01)**

Date of Last Inspection: September 24-28, 2012

- A. List of contacts and telephone numbers for the Radiation Protection Organization Staff and Technicians
- B. Applicable organization charts
- C. Audits, self-assessments, and LERs written since date of last inspection, related to this inspection area
- D. Procedure indexes for the radiation protection procedures
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
  - 1. Radiation Protection Program Description
  - 2. Radiation Protection Conduct of Operations
  - 3. Personnel Dosimetry Program
  - 4. Posting of Radiological Areas
  - 5. High Radiation Area Controls
  - 6. RCA Access Controls and Radworker Instructions
  - 7. Conduct of Radiological Surveys
  - 8. Radioactive Source Inventory and Control
  - 9. Declared Pregnant Worker Program
- F. List of corrective action documents (including corporate and subtiered systems) since date of last inspection
  - a. Initiated by the radiation protection organization
  - b. Assigned to the radiation protection organization

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide documents which are "searchable" so that the inspector can perform word searches.

If not covered above, a summary of corrective action documents since date of last inspection involving unmonitored releases, unplanned releases, or releases in which any dose limit or administrative dose limit was exceeded (for Public Radiation Safety Performance Indicator verification in accordance with IP 71151)

- G. List of radiologically significant work activities scheduled to be conducted during the inspection period (If the inspection is scheduled during an outage, please also include a list of work activities greater than 1 rem, scheduled during the outage with the dose estimate for the work activity.)
- H. List of active radiation work permits
- I. Radioactive source inventory list

**3. In-Plant Airborne Radioactivity Control and Mitigation (71124.03)**

Date of Last Inspection: March 7-11, 2011

- A. List of contacts and telephone numbers for the following areas:
  - 1. Respiratory Protection Program
  - 2. Self-contained breathing apparatus
- B. Applicable organization charts
- C. Copies of audits, self-assessments, vendor or NUPIC audits for contractor support (SCBA), and LERs, written since date of last inspection related to:
  - 1. Installed air filtration systems
  - 2. Self-contained breathing apparatuses
- D. Procedure index for:
  - 1. use and operation of continuous air monitors
  - 2. use and operation of temporary air filtration units
  - 3. Respiratory protection
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
  - 1. Respiratory protection program
  - 2. Use of self-contained breathing apparatuses
  - 3. Air quality testing for SCBAs
- F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, related to the Airborne Monitoring program including:
  - 1. continuous air monitors
  - 2. Self-contained breathing apparatuses
  - 3. respiratory protection program

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide documents which are "searchable."

- G. List of SCBA qualified personnel - reactor operators and emergency response personnel
- H. Inspection records for self-contained breathing apparatuses (SCBAs) staged in the plant for use since date of last inspection.
- I. SCBA training and qualification records for control room operators, shift supervisors, STAs, and OSC personnel for the last year.

A selection of personnel may be asked to demonstrate proficiency in donning, doffing, and performance of functionality check for respiratory devices.