



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

May 13, 2011

Christopher J. Schwarz, Site Vice President
Arkansas Nuclear One
Entergy Operations, Inc.
1448 SR 333
Russellville, AR 72802-0967

Subject: ARKANSAS NUCLEAR ONE - NRC INTEGRATED INSPECTION REPORT
NUMBER 05000313/2011002 AND 05000368/2011002

Dear: Mr. Schwarz:

On March 31 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Arkansas Nuclear One facility. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 7, 2011, with Mike Chisum, General Manager, and other members of your staff.

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

Based on the results of this inspection, the NRC has identified issues that were evaluated under the risk significance determination process as having very low safety significance (Green). The NRC has determined that violations are associated with these issues. Additionally, one licensee-identified violation, which was determined to be of very low safety significance, is listed in this report. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as a noncited violations, consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or the significance of the noncited violations, 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, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 612 E. Lamar Blvd, Suite 400, Arlington, Texas, 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the facility. In addition, if you disagree with the cross-cutting aspect assigned to any finding 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 facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

Sincerely,

/RA/

Jeffrey A. Clark, P.E.
Chief, Project Branch E
Division of Reactor Projects

Docket: 50-313; 50-386
License: DRP-51, NPF-6

Enclosure:
NRC Inspection Report 05000313/2011002; 05000368/2011002
w/Attachment: Supplemental Information

cc w/Enclosure:

Distribution via ListServ

Electronic distribution by RIV:

Regional Administrator (Elmo.Collins@nrc.gov)
 Deputy Regional Administrator (Art.Howell@nrc.gov)
 DRP Director (Kriss.Kennedy@nrc.gov)
 DRP Deputy Director (Troy.Pruett@nrc.gov)
 DRS Director (Anton.Vegel@nrc.gov)
 DRS Deputy Director (Tom.Blount@nrc.gov)
 Senior Resident Inspector (Alfred.Sanchez@nrc.gov)
 Resident Inspector (Jeff.Rotton@nrc.gov)
 Resident Inspector (William.Schaup@nrc.gov)
 Branch Chief, DRP/E (Jeff.Clark@nrc.gov)
 Senior Project Engineer, DRP/E (Ray.Azua@nrc.gov)
 Project Engineer (Jim.Melfi@nrc.gov)
 Project Engineer (Chris.Smith@nrc.gov)
 ANO Administrative Assistant (Gloria.Hatfield@nrc.gov)
 Public Affairs Officer (Victor.Dricks@nrc.gov)
 Public Affairs Officer (Lara.Uselding@nrc.gov)
 Project Manager (Kaly.Kalyanam@nrc.gov)
 Branch Chief, DRS/TSB (Michael.Hay@nrc.gov)
 RITS Coordinator (Marisa.Herrera@nrc.gov)
 Regional Counsel (Karla.Fuller@nrc.gov)
 Executive Technical Assistant (Stephanie.Bush-Goddard@nrc.gov)
 Congressional Affairs Officer (Jenny.Weil@nrc.gov)
 OEmail Resource
 ROPreports
 OEDO RIV Coordinator (Nathan.Sanfilippo@nrc.gov)
 NSIR/DPR/EP (Eric.Schrader@nrc.gov)
 DRS/TSB STA (Dale.Powers@nrc.gov)

R:_REACTORS\ANO\IR2011002-RP-AS

SUNSI Rev Compl.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ADAMS	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Reviewer Initials	RVA
Publicly Avail	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sensitive	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Sens. Type Initials	RVA
SRI:DRP/E	RI:DRP/E	RI:DRP/E	SPE:DRP/E	C:DRS/EB1	C:DRS/EB2
ASanchez	JRotton	WSchaup	RAzua	TRFarnholtz	NFO'Keefe
/RA-E/	/RA-E/	/RA-E/	/RA/	/RA/	/JM for/
5/13/11	5/13/11	5/13/11	5/11/11	5/12/11	5/12/11
C:DRS/OB	C:DRS/PSB1		C:DRS/PSB2	C:DRS/TSB	C:DRP/E
MShaire	MPShannon		GEWerner	MCHay	JClark
/LH for/	/RA/		/JD for/	/DP for/	/RA/
5/12/11	5/12/11		5/13/11	5/13/11	5/13/11

OFFICIAL RECORD COPY

T=Telephone

E=E-mail

F=Fax

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000313; 05000368

License: DPR-51; NPF-6

Report: 05000313/2011002; 05000368/2011002

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: January 1 through March 31, 2011

Inspectors: A. Sanchez, Senior Resident Inspector
J. Rotton, Resident Inspector
W. Schaup, Resident Inspector.
I. Anchondo, Reactor Inspector
B. Baca, Project Engineer
C. Graves, Health Physicist
J. Melfi, Reactor Inspector
L. Ricketson, P.E., Senior Health Physicist

Approved By: Jeffrey A.Clark, P.E., Chief, Project Branch E
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000313/2011002; 05000368/2011002; 01/01/2011 - 03/31/2011; Arkansas Nuclear One, Integrated Resident and Regional Report; Temporary Modification; Surveillance Testing; and Problem Identification and Resolution.

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by region-based inspectors. Four Green noncited violations of significance were identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The crosscutting aspect is determined using Inspection Manual Chapter 0310, "Components Within the Cross Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors documented a self-revealing noncited violation of Unit 1 Technical Specification 5.4.1.a for the failure to follow procedure OP-1104.002 "Makeup and Purification System Operation", Revision 69. Specifically, while draining to depressurize the emergency core cooling system suction header from 55.6 psig to approximately 20 psig to support testing BW-2, P-36 B/C suction stop check isolation valve, operations personnel monitored the incorrect suction pressure indication, drained and depressurized significantly longer than specified in the procedure resulting in the suction header pressure lowering to approximately 1.6 psig before securing the draining evolution. Immediate actions taken to restore compliance included operations personnel filling the emergency core cooling system suction header and subsequent ultra sonic testing on the effected piping to verify no voids existed. This issue was entered into the licensee's corrective action program as Condition Report CR-ANO-1-2011-0290.

The inspectors determined that operations personnel failed to follow the requirements of procedure OP-1104.002, by failing to monitor the correct pressure indication and by draining significantly longer than the procedure specified. This resulted in inadvertently depressurizing the emergency core cooling suction header to approximately 1.6 psig. This was determined to be a performance deficiency. Specifically, the failure to follow OP-1104.002, as required by Technical Specification 5.4.1.a, and inadvertently depressurizing the emergency core cooling system header was reasonably within the licensee's ability to foresee and correct. 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, lowering pressure below 20 psig potentially voided the emergency core cooling system suction header which would affect the availability of the emergency core cooling system train. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance, Green, because: (1) the finding was not a qualification deficiency that resulted in a loss functionality of the emergency core cooling system header, (2) it did not lead to an actual loss of safety function of the system or train, (3) it did not result in an actual loss of safety function of a single train for greater than its technical specification allowed outage time, (4) it did not represent an actual loss of safety function of one or more nontechnical specification trains of equipment designated as risk-significant per 10 CFR 50.65, for greater than 24 hours and (5) it did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The finding was determined to have a crosscutting aspect in the area of human performance, associated with work practices in that the licensee failed to ensure supervisory and management oversight of work activities were such that nuclear safety was supported when the control room supervisor unknowingly became involved in the task and did not maintain supervision, [H.4(c)]. (Section 1R22)

- Green. The inspectors documented a self-revealing noncited violation of 10 CFR 50, Appendix B, Criterion XVI for the failure to take timely corrective action to correct a condition adverse to quality. Specifically, the licensee identified an issues the Siemens vacuum breakers' plunger operated auxiliary switches (STA device) becoming stuck in mid travel and would prevent the auxiliary switches from working properly, but failed to correct this issue in a timely manner and resulted in the failure of offsite power transfer test from startup transformer 3 to startup transformer 2.

The failure of the licensee to take prompt corrective action for a previously identified condition adverse to quality was a performance deficiency. Specifically, the licensee was aware of STA devices hanging up during several breaker tests and identified a cause for this phenomenon, initiated corrective action, but failed to implement the corrective action prior to subsequent de-energization of the 2A2 bus during an offsite power transfer test. This was determined to be a performance deficiency because it was within the ability of the licensee to foresee and correct, and was a violation of NRC requirements. The performance deficiency was determined to be more than minor because it was associated with the equipment performance attribute of the Mitigating Events 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. Using Manual Chapter 0609, "Significance Determination Process," Appendix G, Checklist 3, for shutdown operations, and was determined to be of very low safety significance because the core heat removal guidelines associated with instrumentation, training and procedures, and equipment were met. Specifically, both trains of shutdown cooling remained operable with all necessary support equipment. This finding was determined to have a crosscutting aspect in the area

of human performance, associated with work control, in that the licensee failed to appropriately plan work activities by incorporating the need for planned contingencies. Specifically, the licensee failed to incorporate contingency actions to correct any deficiencies discovered during inspection of the STA devices in the 2R20 refueling outage, [H.3(a)]. (Section 4OA2.4)

Cornerstone: Barrier Integrity

- Green. The inspectors documented a self-revealing noncited violation of 10 CFR 50, Appendix B, Criterion III for an inadequate design package. This inadequacy led to the interference and restricted function of the Unit 1 emergency control room ventilation system damper CV-7910, VSF-9 makeup air supply. Specifically, the engineering change, EC-25425, that was used to install a temporary modification to allow control room tracer gas testing, did not specify any clearance requirements between the temporary modification and the CV-7910, VSF-9 makeup air supply damper. This led to restricted damper operation and interference issues. The licensee took immediate action to remove the temporary modification and physically restructured the modification prior to continuing the tracer gas testing. This issue was entered into the corrective action program as CR-ANO- C-2010-2848.

The failure to incorporate clearance requirements for the temporary modification between CV-7910 makeup air supply damper and the tracer gas ductwork adaptor, which prevented full operation of the damper, was determined to be a performance deficiency, because it was within the licensee's ability to foresee and correct and is a violation of NRC requirements. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events, and is therefore a finding. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance, Green, because the finding did not represent a degradation of the barrier function for the control room against radiation, smoke or toxic gas. The finding was determined to have a crosscutting aspect in the area of human performance, associated with resources, in that the licensee did not apply the appropriate engineering thoroughness for the temporary modification due to resource sharing to assist other Entergy sites, and scheduling vacations, which caused an increase in workload during the review and approval of the temporary modification, [H.2(c)]. (Section 1R18)

- Green. The inspectors documented a self-revealing noncited violation of Technical Specification 5.4.1.a for the inadequate maintenance work order and procedure that resulted in damaging the damper, CV-7910, VSF-9 makeup air supply, during planned maintenance activities. Specifically, work order 52220286 referenced a procedurally controlled temporary modification, that referred to an incorrect engineering change document, was vaguely written and led to the

installation of the wrong flange cover and resulted in a damaged damper and challenged the control room envelope integrity. The licensee repaired the damaged damper and entered the issue into corrective action program as Condition Report CR-ANO-C-2010-2429.

The failure of the licensee to provide adequate procedural guidance, that led to the installation of the wrong flange cover and resulted in a bent damper, CV-7910, associated with the Unit 1 control room emergency ventilation system was a performance deficiency. This was determined to be within the licensee's ability to foresee and correct and is a violation of a unit 1 technical specification. The performance deficiency was determined to be more than minor because it was associated with the procedure quality attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective provide reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events, and is therefore a finding. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance, Green, because the finding did not represent a degradation of the barrier function for the control room against radiation, smoke or toxic gas. The finding was determined to have no cross-cutting aspects due to the procedure change that took place in 2005 and is not indicative of current plant performance. (Section 2OA2.3)

B. Licensee-Identified Violations

Violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers (condition report numbers) are listed in Section 4OA7.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the period at 100 percent reactor power and remained there for the entire period.

Unit 2 began the period at 100 percent reactor power. On February 20, 2011, Unit 2 entered Mode 3 to begin refueling outage 2R21. On March 26, 2011, Unit 2 closed the main generator output breaker to end refueling outage 2R21. On March 28, 2011, Unit 2 reached 100 percent reactor power and remained there for the remainder of the period.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection (71111.01)

Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

Since thunderstorms with potential tornados and high winds were forecast in the vicinity of the facility for February 24, 2011, the inspectors reviewed the plant personnel's overall preparations/protection for the expected weather conditions. On February 24, 2011, the inspectors walked down the Unit 2 decay heat and spent fuel pool cooling systems because their safety-related functions could be affected, or required, as a result of high winds or tornado-generated missiles or the loss of offsite power. The inspectors evaluated the plant staff's preparations against the site's procedures and determined that the staff's actions were adequate. During the inspection, the inspectors focused on plant-specific design features and the licensee's procedures used to respond to specified adverse weather conditions. The inspectors also toured the plant grounds to look for any loose debris that could become missiles during a tornado. The inspectors evaluated operator staffing and accessibility of controls and indications for those systems required to control the plant. Additionally, the inspectors reviewed the Safety Analysis Report and performance requirements for the systems selected for inspection, and verified that operator actions were appropriate as specified by plant-specific procedures. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one (1) readiness for impending adverse weather condition sample as defined in Inspection Procedure 71111.01-05.

b. Findings

No findings were identified.

1R04 Equipment Alignments (71111.04)

Partial Walkdown

a. Inspection Scope

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

- January 16, 2011, Unit 2, 2K-4B emergency diesel generator while the 2K-4A emergency diesel generator was out of service for 2 year overhaul
- March 23, 2011, Unit 2, 2P-89A high pressure safety injection train after major pump maintenance

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, Safety Analysis Report, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two (2) partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- February 2, 2011, Unit 2, Fire Zone 2010, service water intake structure
- February 21, 2011, Unit 2, Fire Zone 2032-K and 2033-K, containment building
- March 14, 2011, Unit 1, Fire Zone 77-V, upper south piping penetration room
- March 14, 2011, Unit 1, Fire Zone 1-E, north emergency diesel generator exhaust fans room
- March 14, 2011, Unit 1, Fire Zone 97-R, cable spreading room
- March 15, 2011, Unit 2, Fire Zone 2100-Z, south switchgear (2A4) room
- March 15, 2011, Unit 2, Fire Zone 2156-A, containment purge air equipment area

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of seven (7) quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

.1 Inspection Activities Other Than Steam Generator Tube Inspection, Pressurized Water Reactor Vessel Upper Head Penetration Inspections, and Boric Acid Corrosion Control (71111.08-02.01)

a. Inspection Scope

The inspectors observed four nondestructive examination activities and/or reviewed five nondestructive examination activities that included three types of examinations. The licensee did not identify any relevant indications accepted for continued service during the nondestructive examinations.

The inspectors directly observed the following nondestructive examinations:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Reactor Coolant System	2-28-023	Ultrasonic
Reactor Coolant System	Control Rod Drive Mechanism Penetration 64	Ultrasonic
Reactor Coolant System	Control Rod Drive Mechanism Penetration 17	Ultrasonic
Reactor Coolant System	Control Rod Drive Mechanism Penetration 3	Ultrasonic

The inspectors reviewed records for the following nondestructive examinations:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Reactor Coolant System	Reactor Coolant Drain to Reactor Drain Tank (Weld 2-39-002)	Ultrasonic
Reactor Coolant System	Reactor Coolant Drain to Reactor Drain Tank (Weld 2-39-003)	Ultrasonic
Reactor Coolant System	Reactor Coolant Drain to Reactor Drain Tank (Weld 2-39-004)	Ultrasonic
Reactor Coolant System	2T-1 Pressurizer Skirt Weld (2-05-001S)	Visual Type 3
Reactor Coolant System	RCP 2P-32A Gland Seal (2-32-018)	Visual Type 1

During the review and observation of each examination, the inspectors verified that activities were performed in accordance with the ASME Code requirements and applicable procedures. The inspectors also verified the qualifications of all nondestructive examination technicians performing the inspections were current.

These actions constitute completion of the requirements for Section 02.01.

b. Findings

No findings were identified.

.2 Vessel Upper Head Penetration Inspection Activities (71111.08-02.02)

a. Inspection Scope

The inspectors reviewed the results of licensee personnel's visual inspection of pressure-retaining components above the reactor pressure vessel head to verify that there was no evidence of leaks or boron deposits on the surface of the reactor pressure vessel head or related insulation. The inspectors verified that the personnel performing the visual inspection were certified as Level II and Level III VT-2 examiners. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements for Section 02.02.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control Inspection Activities (71111.08-02.03)

a. Inspection Scope

The inspectors evaluated the implementation of the licensee's boric acid corrosion control program for monitoring degradation of those systems that could be adversely affected by boric acid corrosion. The inspectors reviewed the documentation associated with the licensee's boric acid corrosion control walkdown as specified in Procedures FTK-ESPP-G0051, "Boric Acid Corrosion Evaluation," Revision 2, and EN-DC-319, "Inspections and Evaluation of Boric Acid Leaks," Revision 6. The inspectors also reviewed the visual records of the components and equipment. The inspectors verified that the visual inspections emphasized locations where boric acid leaks could cause degradation of safety-significant components. The inspectors also verified that the engineering evaluations for those components where boric acid was identified gave assurance that the ASME Code wall thickness limits were properly maintained. The inspectors confirmed that the corrective actions performed for evidence of boric acid leaks were consistent with requirements of the ASME Code. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements for Section 02.03.

b. Findings

No findings were identified.

.4 Steam Generator Tube Inspection Activities (71111.08-02.04)

a. Inspection Scope

The licensee did not perform steam generator inspection activities this refueling outage.

These actions constitute completion of the requirements of Section 02.04.

b. Findings

No findings were identified.

.5 Identification and Resolution of Problems (71111.08-02.05)

a. Inspection scope

The inspectors reviewed 12 condition reports which dealt with inservice inspection activities and found the corrective actions for inservice inspection issues were appropriate. The specific condition reports reviewed are listed in the documents reviewed section. From this review the inspectors concluded that the licensee has an appropriate threshold for entering issues inservice inspection issues into the corrective action program and has procedures that direct a root cause evaluation when necessary. The licensee also has an effective program for applying industry inservice inspection operating experience. Specific documents reviewed during this inspection are listed in the attachment.

These actions constitute completion of the requirements of Section 02.05.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

On February 16, 2011, the inspectors observed a crew of licensed operators in the plant's simulator for just-in-time training, in preparation for shutting down the Unit 2 reactor for refueling outage 2R21, to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance
- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications
- Crew's usage and validation of shutdown procedures

The inspectors compared the crew's performance in these areas to preestablished operator action expectations and successful critical task completion requirements. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one (1) quarterly licensed-operator requalification program sample as defined in Inspection Procedure 71111.11-05.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- March 31, 2011, Unit 2, high pressure safety injection and HPSI pressurization system

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices

- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or -(a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one (1) quarterly maintenance effectiveness sample as defined in Inspection Procedure 71111.12-05.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- January 6, 2011 through January 8, 2011, Unit 1, high risk (orange) due to draining loop 1 of station service water to affect a code repair for a leak on service water piping associated with reactor building cooling coils

- February 2, 2011, Unit 1, elevated risk due to emergency feedwater steam admission valve CV-2613 manual/auto pushbutton replacement
- February 16-17, 2011, Unit 2, outage risk profile review for 2R21
- February 27-28, 2011, Unit 1 and Unit 2 risk and actions based on emergent tornado warning
- March 2, 2011, Unit 2, risk assessment with startup transformer 3 out of service (one off site power line available) with heavy equipment in the switchyard and core off loaded
- March 11, 2011, Unit 1, risk elevation due to planned switchyard maintenance on the North 500kV bus
- March 31, 2011, Unit 1, risk evaluation with loss of one VCH-4, emergency switchgear chiller
- March 31, 2011, Unit 1, mobile crane use and transportation through the main transformer yard from an issue in December 2010

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of eight (8) maintenance risk assessments and emergent work control inspection samples as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- January 3, 2011, Unit 1, manhole 9 following discovery of water and structural damage during a routine surveillance activity
- January 27, 2011, Unit 1, turbine driven emergency feedwater steam admission valve CV-2613 pushbutton failure preventing the manual mode of operation
- February 22, 2011, Unit 1, train A emergency core cooling suction header following inadvertent depressurization
- March 15, 2011, Unit 2, 2K-4A emergency diesel generator vibrating clean fuel oil drain line during monthly surveillance test
- March 21, 2011, Unit 2, containment recirculation sump following closeout inspection

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and Safety Analysis Report to the licensee personnel's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of five (5) operability evaluations inspection samples as defined in Inspection Procedure 71111.15-04

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

Temporary Modifications

a. Inspection Scope

To verify that the safety functions of important safety systems were not degraded, the inspectors reviewed the temporary modification on emergency control room ventilation

makeup air bypass damper to support tracer gas testing for control room inleakage determination.

The inspectors reviewed the temporary modification and the associated safety-evaluation screening against the system design bases documentation, including the Safety Analysis Report and the technical specifications, and verified that the modification did not adversely affect the system operability/availability. The inspectors also verified that the installation and restoration were consistent with the modification documents and that configuration control was adequate. Additionally, the inspectors verified that the temporary modification was identified on control room drawings, appropriate tags were placed on the affected equipment, and licensee personnel evaluated the combined effects on mitigating systems and the integrity of radiological barriers.

These activities constitute completion of one (1) sample for temporary plant modifications as defined in Inspection Procedure 71111.18-05.

b. Findings

Introduction. The inspectors documented a Green self-revealing noncited violation of 10 CFR 50, Appendix B, Criterion III for an inadequate design package that led to interference and restricted function of the Unit 1 emergency control room ventilation system damper CV-7910, VSF-9 makeup air supply. Specifically, the engineering change, EC-25425, that was used to install a temporary modification, to allow control room tracer gas testing, did not specify any clearance requirements between the temporary modification and the CV-7910, VSF-9 makeup air supply damper, which led to restricted damper operation and interference issues.

Description. On November 3, 2010, the licensee was preparing for Unit 1 and Unit 2 control room envelope testing and surveillance activities via the tracer gas method. The purpose of the testing was to determine the amount of unfiltered inleakage that existed for control room habitability during an accident. In order to uniformly inject the tracer gas into the control room, a temporary modification was needed to convert the rectangular shaped damper housing to the VSF-9 makeup air damper CV-7910, to a round opening to support an elephant trunk hose to inject the tracer gas. The modification was installed via instructions contained in engineering change, EC-25425. Following installation of the temporary modification, while attempting to place the control room ventilation into recirculation mode using the emergency control room ventilation unit VSF-9, operation's personnel identified that full travel of the damper could not be reached. Upon investigation, the licensee determined that the CV-7910 damper could not operate as designed because the temporary modification interfered with the damper blade. Testing was immediately stopped while engineering, maintenance, and operations resolved the interference issue. The licensee entered the issue into the corrective action program as Condition Report CR-ANO-C-2010-2848. The licensee modified the temporary modification and successfully completed the testing without further incident.

The licensee performed an apparent cause evaluation and a human performance error review. The investigation determined that the temporary modification installers (craft) did not have enough guidance in the work order and in the engineering change, EC-

25425, to ensure that clearance between the damper and the temporary modification ductwork was sufficient to prevent interference. The temporary modification had been successfully installed in 2001 for the last performance of the tracer gas testing, but the latent error of not ensuring the clearance specifications were described in the engineering change paperwork was not identified as a result of a lack of engineering thoroughness. The licensee determined that the lack of engineering thoroughness was caused by a sizeable engineering workload which reduced the amount of time available to develop, review and approve the engineering change. This workload was the result of resource sharing with other sites in the fleet and scheduled staff vacations.

Analysis. The failure to incorporate clearance requirements for the temporary modification between CV-7910 makeup air supply damper and the tracer gas ductwork adaptor, which prevented full operation of the damper, was determined to be a performance deficiency, because it was within the licensee's ability to foresee and correct and is a violation of NRC requirements. The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events, and is therefore a finding. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance, Green, because the finding did not represent a degradation of the barrier function for the control room against radiation, smoke or toxic gas. The finding was determined to have a crosscutting aspect in the area of human performance, associated with resources, in that the licensee did not apply the appropriate engineering thoroughness for the temporary modification due to resource sharing to assist other Entergy sites, and scheduling vacations, which caused an increase in workload during the review and approval of the temporary modification, [H.2(c)].

Enforcement. The Code of Federal Regulations, 10 CFR 50, Appendix B, Criterion III, states, in part, "Measures shall be established to assure that applicable regulatory requirements and design basis,...,for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Contrary to the above, the licensee failed to ensure adequate clearance requirements were included in temporary modifications instructions. This failure resulted in the interference and improper operation of the Unit 1 emergency control room ventilation damper, CV-7910, VSF-9 makeup air supply. Since this finding is of very low safety significance and has been entered into the corrective action program as Condition Report CR-ANO-C-2010-2848, this violation is being treated as a noncited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: 05000313/2011002-01, "Failure to Incorporate Adequate Clearance Guidance Prevents Full Operation of the Unit 1 Emergency Control Room Ventilation Makeup Air Supply Damper."

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- January 11, 2011, alternate ac diesel generator following repair of starting air compressor valve issues
- January 21, 2011, Unit 1, 2K-4A, emergency diesel generator following 2 year overhaul
- January 29, 2011, Unit 1, emergency feedwater initiation and control system channel C power supply replacement
- March 8, 2011, Unit 2, 2K-4B, emergency diesel generator following cylinder liner replacement and 2R21 outage maintenance
- March 11, 2011, Unit 2, containment building escape hatch inner/outer door seal local leak rate test and barrel test after seal replacement and maintenance
- March 11, 2011, Unit 2, 2B-61M3 and 2B-61M4, selected 480 volt molded case breakers for 2CV-1446-2 and 2CV-1448-2 following breaker replacement.
- March 16, 2011, Unit 2, 2P-89A, high pressure safety injection train A pump following pump replacement
- March 17, 2011, Unit 2, high pressure safety injection header 1 flow control valve, 2CV-5035-1, following cleaning of the closed circuit torque switch contacts

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following (as applicable):

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed
- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the Safety Analysis Report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to

determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of eight (8) postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed the outage safety plan and contingency plans for the refueling outage, conducted from February 20, 2011 through March 26, 2011, to confirm that licensee personnel had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance of defense in depth. During the refueling outage, the inspectors observed portions of the shutdown and cooldown processes and monitored licensee controls over the outage activities listed below.

- Configuration management, including maintenance of defense in depth, is commensurate with the outage safety plan for key safety functions and compliance with the applicable technical specifications when taking equipment out of service.
- Clearance activities, including confirmation that tags were properly hung and equipment appropriately configured to safely support the work or testing.
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication, accounting for instrument error.
- Status and configuration of electrical systems to ensure that technical specifications and outage safety-plan requirements were met, and controls over switchyard activities.
- Monitoring of decay heat removal processes, systems, and components.
- Verification that outage work was not impacting the ability of the operators to operate the spent fuel pool cooling system.
- Reactor water inventory controls, including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss.

- Controls over activities that could affect reactivity.
- Maintenance of secondary containment as required by the technical specifications.
- Refueling activities, including fuel handling and sipping to detect fuel assembly leakage.
- Startup and ascension to full power operation, tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block emergency core cooling system suction strainers, and reactor physics testing.
- Licensee identification and resolution of problems related to refueling outage activities.

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one (1) refueling outage inspection sample as defined in Inspection Procedure 71111.20-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the Safety Analysis Report procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls

- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- January 15 - 16, 2011, Unit 2, 2K-4A emergency diesel generator time delay relay testing as part of the 2-year preventative maintenance
- February 17, 2011, Unit 2, 2P-89C, high pressure safety injection pump quarterly inservice test
- February 25, 2011, Unit 1, P-36C, high pressure injection pump quarterly inservice test
- March 7, 2011, Unit 1, monthly reactor protection system channel A test
- March 8, 2011, Unit 2, 2P-89A, high pressure safety injection pump suction/discharge header fill and vent/void inspection
- March 9, 2011, Unit 2, train A containment spray pump system fill and vent/void inspection
- March 9, 2011, Unit 2, train A low pressure safety injection system fill and vent/void inspection
- March 15, 2011, Unit 2, local leak rate testing on containment building escape hatch

- March 20, 2011, Unit 2, train A emergency core cooling system ultrasonic testing examinations for gas intrusion following system fill and vent

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of nine (9) surveillance testing inspection samples as defined in Inspection Procedure 71111.22-05.

b. Findings

Introduction: The inspectors documented a Green self-revealing noncited violation of Unit 1 Technical Specification 5.4.1.a for the failure to follow procedure OP-1104.002 "Makeup and Purification System Operation", Revision 69. Specifically, while draining to depressurize the ECCS suction header from 55.6 psig to approximately 20 psig to support testing BW-2, P-36 B/C suction stop check isolation valve, operations personnel monitored the incorrect suction pressure indication and drained significantly longer than specified in the procedure resulting in the suction header pressure lowering to approximately 1.6 psig before securing the draining evolution. This issue was entered into the licensee's corrective action program as Condition Report CR-ANO-1-2011-0290.

Description: On February 22, 2011, operations personnel were performing Supplement 5 of OP-1104.002, to satisfy quarterly testing requirements to demonstrate operability of the pump and components. To fully satisfy the quarterly testing requirements the P-36B/C suction stop check valve isolation from the borated water storage tank is checked to ensure it closes.

The pressure on either side of the suction stop check valve is checked to verify the valve is closed. If the borated water storage tank supply line pressure upstream of the check valve is less than 45 psig the check valve is closed. The procedure allows the supply line pressure to be read in the control room from either PT-1408, the P-34B loop decay heat removal pump suction pressure indication or PT-2428, the P-35B reactor building spray pump pressure indication. Operations personnel used PT-2428 and the indicated pressure was 55.6 psig. Since the supply line pressure was greater than 45 psig supply line pressure would have to be reduced to ensure the check valve was closed.

A caution step in the procedure states "Maintaining P-34B pressure approximately 20 psig during venting will ensure no voiding occurs in the suction piping." Also a note in the procedure states "The intent of the following steps is to reduce pressure by venting a small quantity of water from the system." The procedure step then states in part, "...to depressurize P-34B to approximately 20 psig by draining from ABV-6B, P-34B vent to auxiliary building vent header, by momentarily cracking open and then closing ABV-6B while monitoring P-34B suction pressure. When pressure reduces below 45 psig after approximately 5 seconds then the check valve is closed."

Operators were stationed locally to operate ABV-6B and pressure indication was monitored from the control room. Once the draining commenced, the control room monitored pressure at P-35B reactor building spray pump pressure indication PT-2428

instead of P-34B loop decay heat removal pump suction pressure indication PT-1408 as required by the procedure. The draining evolution commenced to lower pressure and continued for approximately 45 minutes. At this point operations personnel realized the wrong indication was being monitored and the correct indication was checked. Data reviewed showed header pressure had been reduced to approximately 1.6 psig and it was estimated that approximately 25 gallons was drained from the borated water storage tank.

Operations personnel then took actions to ensure the piping was filled and subsequently performed ultrasonic testing of the associated piping to determine if there were voids.

Analysis: The inspectors determined that operations personnel failed to follow the requirements of procedure OP-1104.002, by failing to monitor the correct pressure indication and by draining significantly longer than the procedure specified. This resulted in inadvertently depressurizing the emergency core cooling suction header to approximately 1.6 psig. This was determined to be a performance deficiency. Specifically, the failure to follow OP-1104.002, as required by Technical Specification 5.4.1.a, and inadvertently depressurizing the emergency core cooling system header was reasonably within the licensee's ability to foresee and correct. 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, lowering pressure below 20 psig potentially voided the ECCS suction header which would affect the availability of the ECCS train. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance, Green, because: (1) the finding was not a qualification deficiency that resulted in a loss functionality of the ECCS header, (2) it did not lead to an actual loss of safety function of the system or train, (3) it did not result in an actual loss of safety function of a single train for greater than its technical specification allowed outage time, (4) it did not represent an actual loss of safety function of one or more nontechnical specification trains of equipment designated as risk-significant per 10 CFR 50.65, for greater than 24 hours and (5) it did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The finding was determined to have a crosscutting aspect in the area of human performance, associated with work practices in that the licensee failed to ensure supervisory and management oversight of work activities were such that nuclear safety was supported when the control room supervisor unknowingly became involved in the task and did not maintain supervision [H.4(c)].

Enforcement: Technical Specification 5.4.1.a states, in part, that written procedures shall be implemented in accordance with Regulatory Guide 1.33, Appendix A, Section 8.b.(1)(j). Contrary to the above, the licensee failed to follow Procedure OP-1104.002 "Makeup and Purification System Operation" by failing to monitor the correct pressure indication and by draining significantly longer than the procedure specified. This resulted in inadvertently depressurizing the emergency core cooling suction header to approximately 1.6 psig. Because this finding is of very low safety significance and has

been entered into the corrective action program as Condition Report CR-ANO-1-2011-0290, this violation is being treated as a noncited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000313/2011002-02, "Failure to Follow Procedure Results in Depressurizing One Emergency Core Cooling System Suction Header."

2. RADIATION SAFETY

Cornerstone: Occupational and Public Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

This area was inspected to: (1) review and assess licensee's performance in assessing the radiological hazards in the workplace associated with licensed activities and the implementation of appropriate radiation monitoring and exposure control measures for both individual and collective exposures, (2) verify the licensee is properly identifying and reporting Occupational Radiation Safety Cornerstone performance indicators, and (3) identify those performance deficiencies that were reportable as a performance indicator and which may have represented a substantial potential for overexposure of the worker.

The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspectors performed walkdowns of various portions of the plant, performed independent radiation dose rate measurements, and reviewed the following items:

- Performance indicator events and associated documentation reported by the licensee in the Occupational Radiation Safety Cornerstone
- 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

- Radiological hazards control and work coverage, including the adequacy of surveys, radiation protection job coverage, and contamination controls; the use of electronic dosimeters in high noise areas; dosimetry placement; airborne radioactivity monitoring; controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools; and posting and physical controls for high radiation areas and very high radiation areas
- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements
- Audits, self-assessments, and corrective action documents related to radiological hazard assessment and exposure controls since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one (1) required sample as defined in Inspection Procedure 71124.01-05.

b. Findings

No findings were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

This area was inspected to assess performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel and reviewed the following items:

- Site-specific ALARA procedures and collective exposure history, including the current 3-year rolling average, site-specific trends in collective exposures, and source-term measurements
- ALARA work activity evaluations/post job reviews, exposure estimates, and exposure mitigation requirements
- The methodology for estimating work activity exposures, the intended dose outcome, the accuracy of dose rate and man-hour estimates, and intended versus actual work activity doses and the reasons for any inconsistencies
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry

- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas
- Audits, self-assessments, and corrective action documents related to ALARA planning and controls since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one required sample as defined in Inspection Procedure 71124.02-05.

b. Findings

No findings were identified.

2RS03 In-plant Airborne Radioactivity Control and Mitigation (71124.03)

a. Inspection Scope

This area was inspected to verify in-plant airborne concentrations are being controlled consistent with ALARA principles and the use of respiratory protection devices on-site does not pose an undue risk to the wearer. The inspectors used the requirements in 10 CFR Part 20, the technical specifications, and the licensee's procedures required by technical specifications as criteria for determining compliance. During the inspection, the inspectors interviewed licensee personnel, performed walkdowns of various portions of the plant, and reviewed the following items:

- The licensee's use, when applicable, of ventilation systems as part of its engineering controls
- The licensee's respiratory protection program for use, storage, maintenance, and quality assurance of NIOSH certified equipment, qualification and training of personnel, and user performance
- 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

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one sample as defined in Inspection Procedure 71124.03-05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the performance indicator data submitted by the licensee for the fourth Quarter 2010 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings were identified.

.2 Unplanned Scrams per 7000 Critical Hours (IE01)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams per 7000 critical hours performance indicator for the period from the 1st quarter 2010 through the 4th quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, and NRC integrated inspection reports for the period of January 2010 through December 2010, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two (2) unplanned scrams per 7000 critical hours samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.3 Unplanned Scrams with Complications (IE02)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned scrams with complications performance indicator for the period from the 1st quarter 2010 through the 4th quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, event reports, and NRC integrated inspection reports for the period of January 2010 through December 2010, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two (2) unplanned scrams with complications sample(s) as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.4 Unplanned Power Changes per 7000 Critical Hours (IE03)

a. Inspection Scope

The inspectors sampled licensee submittals for the unplanned power changes per 7000 critical hours performance indicator for the period from the first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, maintenance rule records, event reports, and NRC integrated inspection reports for the period of January 2010 through December 2010, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two (2) unplanned transients per 7000 critical hours sample(s) as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.5 Safety System Functional Failures (MS05)

a. Inspection Scope

The inspectors sampled licensee submittals for the safety system functional failures performance indicator for the period from first quarter 2010 through the fourth quarter 2010. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73." The inspectors reviewed the licensee's operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, issue reports, event reports, and NRC integrated inspection reports for the period of January 2010 through December 2010, to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of two (2) safety system functional failures samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.6 Occupational Exposure Control Effectiveness (OR01)

a. Inspection Scope

The inspectors reviewed performance indicator data for the first quarter 2010 through the fourth quarter 2010. The objective of the inspection was to determine the accuracy and completeness of the performance indicator data reported during these periods. The inspectors used the definitions and clarifying notes contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, as criteria for determining whether the licensee was in compliance.

The inspectors reviewed corrective action program records associated with high radiation area (greater than 1 rem/hr) and very high radiation area non-conformances. The inspectors reviewed radiological, controlled area exit transactions greater than 100 mrem. The inspectors also conducted walkdowns of high radiation areas (greater than 1 rem/hr) and very high radiation area entrances to determine the adequacy of the controls of these areas.

These activities constitute completion of two (2) occupational exposure control effectiveness samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.7 Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual
Radiological Effluent Occurrences (PR01)

a. Inspection Scope

The inspectors reviewed performance indicator data for the first quarter 2010 through the fourth quarter 2010. The objective of the inspection was to determine the accuracy and completeness of the performance indicator data reported during these periods. The inspectors used the definitions and clarifying notes contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, as criteria for determining whether the licensee was in compliance.

The inspectors reviewed the licensee's corrective action program records and selected individual annual or special reports to identify potential occurrences such as unmonitored, uncontrolled, or improperly calculated effluent releases that may have impacted offsite dose.

These activities constitute completion of two (2) radiological effluent technical specifications/offsite dose calculation manual radiological effluent occurrences samples as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

40A2 Identification and Resolution of Problems (71152)

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

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and

previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting an incident where the Unit 1 emergency control room ventilation system makeup air bypass damper had been damaged during a maintenance activity. The inspectors had previously inspected the operability evaluation and recall that there was a potential issue associated with the maintenance and the post maintenance testing activities. The incident also involved a potential technical specification violation.

These activities constitute completion of one (1) in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

Introduction. The inspectors documented a Green, self-revealing noncited violation of Technical Specification 5.4.1.a for inadequate maintenance work order and procedure that resulted in damaging the damper, CV-7910, VSF-9 makeup air supply, during planned maintenance activities. Specifically, the work order 52220286 referenced a procedurally controlled temporary modification that referred to an incorrect engineering change document and was vaguely written and led to the installation of the wrong flange cover and resulted in a damaged damper and challenged the control room envelope integrity.

Description. On September 17, 2010, operations discovered that the damper blade for CV-7910 (VSF-9 makeup air supply) for the Unit 1 control room emergency ventilation system was damaged and was not capable of being fully closed or fully opened. An investigation revealed that the maintenance performed the day before, on September 16, 2010, to rebuild the damper actuator had resulted in the bent damper condition. The licensee issued condition reports CR-ANO-C-2010-2429, 2418, 2424, and 2425 for the issue.

Work order 52220286 was written to rebuild the CV-7910 damper operator. The work order referenced procedure OP-2104.007, "Control Room Emergency Air Conditioning and Ventilation," Revision 47, to install a temporary modification to ensure control room envelope integrity while working on the damper. This temporary modification consisted of bolting a blank flange on the damper housing. Due to the damper housing not being very deep, the damper, when opened does extend beyond the housing. During the maintenance the damper was stroked and contacted the blank flange and became bent without being detected by the licensee.

In April 2004, an engineering request, ER-2003-0235-000, was issued to provide a method to secure damper CV-7910 flow path with the actuator removed for a maintenance rebuild. There were two options to accomplish this: use jacking bolts to secure the damper in the closed position or install a flat plate cover at the inlet of the damper. There were two more engineering requests, that were sequentially numbered, that were issued that further refined methods of securing the damper, however they did not supersede each other and stood alone as separate engineering requests, i.e. all were still active and valid. Engineering request ER-2003-0235-002 was approved in September 2005 and implemented the use of a "top hat" flange design as to not interfere with the damper, because it was determined that this was possible. Procedure, OP-2104.007 referenced engineering request ER-2003-0235 and not the specific ER-2003-0235-002 and failed to call the flange by its proper name, ER-2003-0235-002 CV-7910 Duct Isolation device." To further confuse the issue with the craft installing the temporary modification is the fact that the original flat plate was physically stationed at the damper for use when necessary, so the craft never thought twice that the flange stationed at the damper may not be the flange described in OP-2104.007. This was a human performance error trap.

The licensee's apparent cause investigation determined that the procedure, OP-2104.007, referenced in the maintenance work order, incorrectly referred to engineering

request ER-2003-0235-00, and did not clearly specify which flange cover plate was to be used in installing the temporary modification. This error in the implementing procedure has existed since 2005 and the temporary modification has been installed successfully, on four different occasions, since then.

Analysis. The failure of the licensee to provide adequate procedural guidance, that led to the installation of the wrong flange cover and resulted in a bent damper, CV-7910, associated with the Unit 1 control room emergency ventilation system was a performance deficiency. This was determined to be within the licensee's ability to foresee and correct and is a violation of a unit 1 technical specification. The performance deficiency was determined to be more than minor because it was associated with the procedure quality attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective provide reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events, and is therefore a finding. Using Manual Chapter 0609.04, "Phase 1 - Initial Screening and Characterization of Findings," the finding was determined to have very low safety significance, Green, because the finding did not represent a degradation of the barrier function for the control room against radiation, smoke or toxic gas. The finding was determined to have no cross-cutting aspects due to the procedure change that took place in 2005 and is not indicative of current plant performance.

Enforcement. Technical Specification 5.4.1.a states, in part, that written procedures shall be implemented in accordance with Regulatory Guide 1.33, Appendix A, Section 9. Contrary to the above, the licensee failed to provide adequate procedural guidance in procedure OP-2104.007, "Control Room Emergency Air Conditioning and Ventilation," Revision 47, which led to the installation of the wrong flange over the CV-7910 VSF-9 makeup supply damper, and resulted in damage to the damper during maintenance. Because this finding is of very low safety significance and has been entered into the corrective action program as Condition Reports CR-ANO-C-2010-2429, 2418, 2424, and 2425, this violation is being treated as a noncited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000313/2011002-03, "Inadequate Procedural Guidance Results in Damaged Emergency Control Room Ventilation System Air Damper."

. 4 Selected Issue Follow-up Inspection

a. Inspection Scope

During a review of items entered in the licensee's corrective action program, the inspectors recognized a corrective action item documenting several issues, deficiencies and failures of 4160 volt Siemens vacuum breaker auxiliary switch devices (STA devices). Since 2008, the licensee had identified several of the STA devices that had become stuck in a mid travel position but had been enough to actuate the contacts in the auxiliary contact block. A failure during a offsite fast transfer test in 2009 prompted a renewed interest and accelerated the resolution process. Currently, the licensee has been and continues to implement permanent modifications to resolve the issue.

These activities constitute completion of one (1) in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

Introduction. The inspectors documented a Green self-revealing noncited violation of 10 CFR 50, Appendix B, Criterion XVI for the failure to take timely corrective action to correct a condition adverse to quality. Specifically, the licensee identified a issue with the Siemens vacuum breakers' plunger operated auxiliary switches (STA device) becoming stuck in mid travel and would prevent the auxiliary switches from working properly, but failed to correct this issue in a timely manner and resulted in the failure of offsite power transfers from startup transformer 3 to startup transformer 2.

Description. On September 14, 2009, during an offsite power fast transfer surveillance test, in accordance with procedure, OP-2305.054, "Offsite Power Transfer Test," Revision 4, the 2A2 bus, which was powered from startup transformer 3, failed to fast transfer to startup transformer 2. Condition Reports CR-ANO-2-2009-2700 and 2702 were initiated. During the licensee's investigation, the STA devices on both feeder breakers, 2A-213 (startup transformer 3) and 2A-211 (startup transformer 2), were found to have been bound and had not completed full travel and therefore did not actuate the permissive as required to allow the startup transformer 2 to close in on the 2A2 bus.

In the 1999-2001 time frame, Arkansas Nuclear One replaced Unit 1 and Unit 2 red train 4160 volt breakers for original General Electric Magneblast design to Siemens vacuum breakers. The auxiliary contact block, which is actuated from breaker position mechanism (open or closed), is used to provide interlocks indications, permissives, and alarms based on breaker position. The operating mechanism for this contact block is a vertical plunger that is connected to a horizontal shaft and is operated mechanically from the breaker and is referred to as the STA device. Upon the retro fit from the General Electric Magneblast breakers to the Siemens vacuum breakers, the STA devices, which were supplied by Siemens and dedicated through Wyle laboratories, were required to be changed out as well. The new STA devices operated with a lower spring pressure as the vacuum breakers required less force to operate.

In December 2008, during the Unit 1 1R21 refueling outage, two STA devices were discovered to be stuck in a mid-position but still actuated the auxiliary contact block. Both STA devices were replaced prior to the end of the Unit 1 refueling outage. Three months later, in March 2009 one of the STA devices was again discovered to be in a mid position following breaker manipulation to transfer loads from the unit auxiliary transformer to the startup transformer 1 due to an unrelated issue. Condition Report CR-ANO-1-2008-2379 was initiated for these STA device issues. The licensee determined that the horizontal shaft that operated the auxiliary contact block, if installed off centered, would interfere with the brass bushing on the STA device housing where the shaft penetrated. Enough force could be present to prevent full travel of the plunger and result in the auxiliary contacts in the contact block from changing states as designed. The licensee initiated correction action that stated, in part, "Regardless of scope add approval, all subject U2 STAs are to be inspected by the end of the year [2009]; Any STAs found in an intermediate position and/or with off center shaft during

2R20 will have the shaft centered in 2R20 with subsequent Work Requests issued to replace bushings on these STAs during the next outage.”

In 2R20, work orders were completed to perform the STA device inspections and nine were identified as have off centered shafts. Work requests were issued to inspect and correct them in 2R21 instead of re-centering these shafts in 2R20 because the work did not meet outage scope add criteria. On September 14, 2009, after inspections of the STA devices and the decision not to perform any work to re-center the shafts, the 2A2 4160 volt bus was de-energized during the offsite fast transfer test between startup transformer 3 and startup transformer 2, but the bus did slow transfer as designed. The STA device for breaker 2A-213 (startup transformer 3) and 2A-211 (startup transformer 2) were inspected in place and was discovered to be hung up in a position that did not actuate the contacts in the auxiliary contact block. The licensee replaced both STA devices and tested them satisfactorily. Outage scope add forms were initiated by the 4160 volt breaker engineer to correct the other off centered shafts, but were disapproved by outage management. Work orders were written to correct the issues during the next refueling outage, 2R21, scheduled for Spring 2011. No failures occurred during the operational cycle involving STA devices, and the licensee implemented a modification to the horizontal shaft and bushing replacement to correct the issue in 2R21.

Analysis. The failure of the licensee to take prompt corrective action for a previously identified condition adverse to quality was a performance deficiency. Specifically, the licensee was aware of STA devices hanging up during several breaker tests and identified a cause for this phenomenon, initiated corrective action, but failed to implement the corrective action prior to subsequent de-energization of the 2A2 bus during an offsite power transfer test. This was determined to be a performance deficiency because it was within the ability of the licensee to foresee and correct, and was a violation of NRC requirements. The performance deficiency was determined to be more than minor because it was associated with the equipment performance attribute of the Mitigating Events 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. Using Manual Chapter 0609, “Significance Determination Process,” Appendix G, Checklist 3, for shutdown operations, and was determined to be of very low safety significance because the core heat removal guidelines associated with instrumentation, training and procedures, and equipment were met. Specifically, both trains of shutdown cooling remained operable with all necessary support equipment. This finding was determined to have a crosscutting aspect in the area of human performance, associated with work control, in that the licensee failed to appropriately plan work activities by incorporating the need for planned contingencies. Specifically, the licensee failed to incorporate contingency actions to correct any deficiencies discovered during inspection of the STA devices in the 2R20 refueling outage, [H.3(a)]. (Section 4OA2.4)

Enforcement. Code of Federal Regulation, 10 CFR 50, Appendix B, Criterion XVI states, in part, “Measures shall be established to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, ...are promptly identified and corrected. Contrary to the above, the licensee failed to take prompt corrective action to resolve the 4160 volt Siemens vacuum breaker STA devices sticking issues and directly resulted in a de-

energization of the 2A2 bus during an offsite power transfer test. Since this finding is of very low safety significance and has been entered into the corrective action program as Condition Reports CR-ANO-1-2008-2379, CR-ANO-2-2009-2700 and 2702, this violation is being treated as a noncited violation consistent with Section 3.2.a of the NRC Enforcement Policy: NCV 05000368/2011002-04, "Failure to Take Timely Corrective Action to Correct a Condition Adverse to Quality Associated with 4160 Volt Vacuum Breakers."

40A3 Event Follow-up (71153)

.1 Declaration of Notice of Unusual Event on January 19, 2011

a. Inspection Scope

On January 19, 2001, at approximately 8:58 p.m., the licensee declared an Notification of Unusual Event due to a report of a hostile threat in the owner controlled area. The inspectors, who were already on site for a force on force inspection, verified actions in the secondary alarm station and responded to the control room. The inspectors reviewed the applicable security event procedures, interviewed and discussed the event with the operations staff and ensured proper notifications of offsite agencies were made in accordance with requirements set forth in NUREG-1022, "Event Reporting Guidelines," Revision 2.

b. Findings

No findings were identified.

40A6 Meetings

Exit Meeting Summary

On February 25, 2011, the inspectors debriefed the inspection results to Mr. C. Schwarz, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. All proprietary information was disposed of upon completion of the inspection.

On March 11, 2011, the inspectors presented the results of the radiation safety inspections to Mr. C. Schwarz, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On April 7, 2011, the inspectors presented the inspection results to Mr. Mike Chisum, General Manager, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

40A7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as noncited violations.

- Unit 2 Technical Specification 6.4.1(a) requires that written procedure be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, February 1978. Section 9(a), "Procedures for Performing Maintenance," of Appendix A of Regulatory Guide 1.33 states that procedures for maintenance that can affect the performance of safety-related equipment should be planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Contrary to the above, the licensee failed to have adequate procedural guidance for disassembly and reassembly of the Unit 2 emergency diesel generator exhaust system wye piece. Specifically, the procedure failed to identify specific clearance tolerances due to the cast iron to carbon steel connection to prevent cracking of the cast iron exhaust wye piece. The performance deficiency of not providing adequate procedural guidance for maintenance on the Unit 2 emergency diesel generators, was determined to be more than minor because it was associated with the procedure quality attribute and adversely affected the Mitigating System cornerstone objective to ensure availability, reliability, and capability to respond to initiating events to prevent adverse consequences. Using Manual Chapter 0609, Attachment 0609.04, "Initial Screening and Characterization of Findings," the finding was determined to be of very low safety significance because: (1) it was not a design or qualification deficiency, (2) did not represent a loss of safety function, (3) did not represent an actual loss of safety function of a single train for longer than its technical specification allowed outage time, (4) did not represent an actual loss of safety function of one or more non-technical specification trains, and (5) was not potentially risk significant due to seismic, flooding, or severe weather initiating event. The issue was placed into the corrective action program as Condition Report CR-ANO-2-2010-2706.

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Licensee Personnel

J. Bacquet, Supervisor, Radiation Protection
D. Bauman, Sr. Project Manager
M. Chisum, General Manager Plant Operations
R. Crowe, Security Superintendent
R. Fuller, Quality Assurance Manager
D. James, Nuclear Safety Assurance Director
W. Greeson, Engineering Programs and Component Manager
D. Marvel, Supervisor, Radiation Protection
D. Metheany, Steam Generator Programs Owner
J. McCoy, Engineering Director
N. Mosher, Licensing Specialist
L. Muncy, Maintenance Support Superintendent
C. O'Dell, Assistant Operation Manager, Unit 2
K. Panther, ISI Program Manager
S. Pyle, Acting, Licensing Manager
C. Simpson, Operations Training Superintendent
J. Smith, Manager, Radiation Protection
D. Stoltz, Senior Health Physics Specialist, Radiation Protection

NRC Personnel

A. Sanchez, Senior Resident Inspector
J. Rotton, Resident Inspector
W. Schaup, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000313/2011002-01	NCV	Failure to Incorporate Adequate Clearance Guidance Prevents Full Operation of the Unit 1 Emergency Control Room Ventilation Makeup Air Supply Damper (Section 1R18)
05000313/2011002-02	NCV	Failure to Follow Procedure Results in Depressurizing One Emergency Core Cooling System Suction Header (Section 1R22)
05000313/2011002-03	NCV	Inadequate Procedural Guidance Results in Damaged Emergency Control Room Ventilation System Air Damper (Section 4OA2.3)
05000368/2001002-04	NCV	Failure to Take Timely Corrective Action to Correct a Condition Adverse to Quality Associated with 4160 Volt Vacuum Breakers (Section 4OA2.4)

LIST OF DOCUMENTS REVIEWED

Section 1RO1: Adverse Weather Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-1203.025	Natural Emergencies	33
OP-2203.008	Natural Emergencies	21

Section 1RO4: Equipment Alignment

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-2104.039	Unit 2, High Pressure Safety Injection system operation	63
OP-2104.036	Emergency Diesel Generator Operations	78

DRAWINGS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
M-2232	Unit 2, Safety Injection system P&ID	117

Section 1RO5: Fire Protection

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
FHA	ANO Fire Hazard Analysis	13
PHP-U1	ANO Prefire Plan (Unit 1)	13
PHP-U2	ANO Prefire Plan (Unit 2)	10

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
FZ-1041	Unit 1 Fire zone detail – North/South EDG Exhaust Fans room	2
FZ-1042	Unit 1 Fire zone detail – Upper South piping penetration room	2
FZ-1043	Unit 1 Fire zone detail – Cable spreading room	2
FZ-2006	Unit 2 Fire zone detail – Containment purge air equipment area	2
FZ-2055	Unit 2 Fire zone detail – South switchgear room	2
FZ-2010	Unit 2 Intake Structure	2

Section 1R08: Inservice Inspection Activities

DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
CEP-NDE-0423	Manual Ultrasonic Examination of Austenitic Piping Welds (ASME XI)	4
FTK-ESPP-G0051	Boric Acid Corrosion Evaluation	2
ASCBTESPP-S0603	Refueling Outage Boric Acid	3
EN-DC-319	Inspections and Evaluation of Boric Acid Leaks	6
1032.037	Inspection and Identification of Boric Acid Leaks for ANO-1 and ANO-2	5
PDI-UT-1	PDI Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds	D
CEP-NDE-0404	Manual Ultrasonic Examination of Ferritic Piping Welds (ASME XI)	4
EN-111SR-001	Long Term Storage Requirements for Arkansas Nuclear One, Unit 2 Replacement Reactor Vessel Closure Head	1

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
EN-111SR-001	Long Term Storage Requirements for Arkansas Nuclear One, Unit 2 Replacement Reactor Vessel Closure Head	2
	Entergy Quality Assurance Manual	21
	ANO-2 Replacement Reactor Vessel Closure Head	November 30, 2010
	Monthly Surveillance Inspection Checklist	
	ANO-2 Replacement Reactor Vessel Closure Head	December 30, 2010
	Monthly Surveillance Inspection Checklist	
	ANO-2 Replacement Reactor Vessel Closure Head	February 2, 2011
	Monthly Surveillance Inspection Checklist	

CONDITION REPORTS (CR-ANO)

1-2007-01747	1-2008-00921	1-2010-00717	1-2010-01668	1-2010-01933
2-2011-00519	2-2011-00227	2-2011-00240	2-2011-00227	2-2011-00240
C-2009-02544	C-2011-00739			

WORK ORDERS

225177	2111314
--------	---------

BORIC ACID EVALUATIONS

11-ANO2-0004	11-ANO2-0005	11-ANO2-0006	11-ANO2-0007	11-ANO2-0008
11-ANO2-0010	11-ANO2-0011			

REACTOR HEAD ULTRASONIC EXAMINATIONS

Penetration 1	Penetration 3	Penetration 7	Penetration 8	Penetration 11
Penetration 17	Penetration 24	Penetration 64		

EXAM REPORTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
2-ISI-UT-11-027	RCS 39-002 Safe End to Elbow Circumferential Weld	February 25, 2011
2-ISI-UT-11-028	RCS 39-003 Safe End to Elbow Circumferential Weld	February 25, 2011
2-ISI-UT-11-029	RCS 39-004 Safe End to Elbow Circumferential Weld	February 25, 2011
2-ISI-UT-11-034	RCS 28-023 Pipe to Safe End Circumferential Weld	February 25, 2011

MISCELLANEOUS

Ops Identified Leak Summary Spreadsheet.

Photographs of Reactor Vessel Head Upper Nozzle Penetrations 1 through 89, Views 0-90 degrees, 90-180 degrees, 180-270 degrees, 270-360 degrees

Section 1R11: Licensed Operator Requalification Program

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
2102.004	Power Operation	48

Section 1R12: Maintenance Effectiveness

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EN-DC-203	Maintenance Rule Program	1
EN-DC-204	Maintenance Rule Scope and Basis	1
EN-DC-205	Maintenance Rule Monitoring	2
EN-DC-206	Maintenance Rule (a)(1) process	2

CONDITION REPORTS (CR-ANO)

2-2010-341 2-2010-1700

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
	Maintenance Rule Database – Scoping & Performance Criteria – Unit 2 HPSI	

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
COPD-024	Risk Assessment Guidelines	34
COPD-024	Risk Assessment Guidelines	35
OP-1015.033	ANO Switchyard and Transformer Yard Controls	13
EN-OP-104	Operability Evaluations	4

CONDITION REPORTS (CR-ANO)

C-2010-3201	2-2011-1469	2-2010-2786	2-2010-1947	2-2010-2715
2-2010-2880	2-2010-2419			

Section 1R15: Operability Evaluations

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
EN-OP-104	Operability Evaluations	4

CONDITION REPORTS (CR-ANO)

1-2011-0290	1-2010-3660	1-2010-3653	1-2011-0147
-------------	-------------	-------------	-------------

Section 1R18: Plant Modifications

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
OP-2104.007	Control Room Emergency Air Conditioning and Ventilation	47

CONDITION REPORTS (CR-ANO)

C-2010-2848 1-10-3521

MISCELLANEOUS DOCUMENTS

ULD-0-SYS-01	ANO Units 1 and 2 Control Room HVAC	9
--------------	-------------------------------------	---

Section 1R19: Postmaintenance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
OP-1403.179	Molded Case Circuit Breaker Testing	18
OP-2104.039	Unit 2 High Pressure Safety Injection system operations	63
OP-2305.017	Unit 2 Local Leak Rate Testing (Containment Escape Hatch)	26
OP-1304.207	Unit 1 EFIC Operations C Monthly Test, SG Pressure Greater Than PSIG	21
OP-2104.036	Emergency Diesel Generator Operations	77
OP-1403.038	Maintenance of Limitorque SB and SMB Actuators	21
OP-2305.006	Cold Shutdown Valve Testing	27
OP-2104.036	Unit 2 Emergency Diesel Generator Operations	76

OP-2104.037	Alternate AC Diesel Generator Operations	20
OP-2104.007	Control Room Emergency Air Conditioning and Ventilation	47

CONDITION REPORTS (CR-ANO)

2-2011-1329	2-2011-0067	C-2010-2429	C-2010-2424
C-2010-2418			

WORK ORDERS

00269883	00221880	00221881	00263800
----------	----------	----------	----------

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EC 19178	Breaker 2B-61M3 Replacement	
EC 19179	Breaker 2B-61M4 Replacement	
ULD-0-SYS-01	ANO Units 1 and 2 Control Room HVAC	9
STM 2-47-3	Control Room Ventilation	21

Section 1R20: Refueling and Other Outage Activities

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-2102.016	Reactor Startup	17
OP-2103.005	Pressurizer Operations	32
OP-2102.002	Plant Heatup	68
OP-2105.009	CEDM Control System Operation	29
OP-2102.004	Power Operation	49

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-2202.001	Standard Post Trip Actions	12
OP-2102.010	Plant Cooldown	46
OP-1015.048	Shutdown Operations Protection Plan	3
OP-2103.011	Draining the Reactor Coolant System	44
OP-1015.008	Unit 2 SDC Control	34
OP-2504.005	Reactor Vessel Closure Head Removal	18

MISCELLANEOUS DOCUMENTS

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION / DATE</u>
CALC-ANO2-NE-09-00002	Core Operating Limits Report for Cycle 21	2

Section 1R22: Surveillance Testing

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
OP-1104.002	Makeup and Purification System Operation	69
OP-2305.017	Local Leak Rate Testing	26
OP-2104.039	HPSI System Operations	061
OP-2104.039	HPSI System Operation	063
OP-1304.037	Unit 1 Reactor Protection System Channel A Test	062
OP-2104.005	Containment Spray operation	060
OP-2104.040	Low Pressure Safety Injection system operation	057
OP-2416.045	Unit 2 2K4A/2K4B EDG Periodic Maintenance	007

CONDITION REPORTS (CR-ANO-)

1-2011-0290 2-2011-0768 2-2011-0888 2-2011-1197

WORK ORDERS

52287353

Section 2RS01: Radiological Hazard Assessment and Exposure Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EN-RP-100	Radiation Worker Expectations	6
EN-RP-101	Access Control for Radiologically Controlled Areas	5
EN-RP-102	Radiological Control	2
EN-RP-108	Radiological Posting	9
EN-RP-143	Source Control	7
EN-RP-151	Radiological Diving	2
EN-RP-201	Dosimetry Administration	3
EN-RP-202	Personnel Monitoring	7
EN-RP-204	Special Monitoring Requirements	3
1012.018	Administration of Radiological Surveys	12

CONDITION REPORTS (CR-ANO)

C-2010-1028	1-2010-1304	1-2010-2135	1-2010-2377
1-2010-1063	1-2010-1444	1-2010-2135	2-2010-2722
1-2010-1125	1-2010-1671	1-2010-2188	

RADIATION WORK PERMITS

<u>NUMBER</u>	<u>TITLE</u>
20112404	Routine Maintenance Activities – Unit 2
20112471	Perform Alloy 600 Inspections of Reactor Head
20112902	2CV-4652 Showing Evidence of Boric Acid Leaks
20112904	Diving Operations for Repairs to Temporary RVCH Lifting Cable

RADIOLOGICAL SURVEYS

<u>NUMBER</u>	<u>TITLE</u>	<u>DATE</u>
1103-0605	Unit 2 Reactor Building 405' General Area	March 9, 2011
909-0038	Unit 2 Reactor Building 381'-389' South Cavity	September 1, 2009
909-0173	Unit 2 Reactor Building 381'-389' South Cavity	September 3, 2009
909-1082	Unit 2 Reactor Building 381'-389' South Cavity	September 16, 2009
1103-0583	Job Coverage	March 9, 2011
1103-0461	Job Coverage	March 7, 2011
1103-0428	Unit Reactor Building 426' General Area	March 7, 2011
1102-0810	High Level Waste Storage Pad	February 26, 2011
1103-0297	Unit 2 Reactor Building 369'-372'South Cavity	March 4, 2011
1103-0463	Unit 2 Reactor Building 335' General Area	March 7, 2011

Section 2RS02: Occupational ALARA Planning and Controls

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EN-RP-105	Radiological Work Permits	9
EN-RP-110	ALARA Program	7
EN-RP-202	Personnel Monitoring	7

CONDITION REPORTS (CR-ANO)

C-2010-01270 C-2010-01940 C-2010-01971 C-2010-02225

RADIATION WORK PERMIT

<u>NUMBER</u>	<u>TITLE</u>
RWP 2010-1420	Remove/Replace Scaffolding
RWP 2010-1421	Remove/Replace Insulation
RWP 2010-1430	Refueling Path Activities
RWP 2010-1442	Steam Generator Primary Side Inspection
RWP 2010-1471	Alloy 600 Inspections
RWP 2010-1472	Alloy 600 DMW Mitigation
RWP 2010-1503	Rx Vessel CSA Bolt Inspection

MISCELLANEOUS DOCUMENTS

<u>TITLE</u>	<u>REVISION/DATE</u>
1R22 ALARA Report	January 19, 2011

Section 2RS03: In-plant Airborne Radioactivity Control and Mitigation

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EN-RP-310	Operation and Initial Setup of the Eberline AMS-4 Continuous Air Monitor	3
EN-RP-501	Respiratory Protection Program	4
EN-RP-502	Inspection and Maintenance of Respiratory Protection Equipment	6
EN-RP-504	Breathing Air	3

CONDITION REPORTS (CR-ANO)

C-2009-00072	C-2010-01935	C-2011-00115
C-2010-01967	C-2010-03041	C-2011-00416

40A1: Performance Indicator Verification

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EN-LI-114	Performance Indicator Process	4

Section 40A2: Identification and Resolution of Problems

PROCEDURES

<u>NUMBER</u>	<u>TITLE</u>	<u>REVISION</u>
EN-LI-102	Corrective Action Process	16

Section 40A7: Licensee Identified Violations

CONDITION REPORTS (CR-ANO)

2-2010-2706